

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549**

**Confidential Draft Submission No. 2
FORM S-1
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

MAGENTA THERAPEUTICS, INC.

(Exact name of Registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

2834
(Primary Standard Industrial
Classification Code Number)

81-0724163
(I.R.S. Employer
Identification Number)

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Approximate date of commencement of proposed sale to public: As soon as practicable after this Registration Statement becomes effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box:

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering:

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering:

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering:

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company) Smaller reporting company

Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 7(a)(2)(B) of the Securities Act.

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price(1)	Amount of Registration Fee(2)
Common Stock, par value \$0.001 per share	\$	\$

(1) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(o) under the Securities Act. Includes the offering price of any additional shares that the underwriters have the option to purchase.

(2) Calculated pursuant to Rule 457(o) under the Securities Act based on an estimate of the proposed maximum aggregate offering price.

The Registrant hereby amends this Registration Statement on such date or dates as may be necessary to delay its effective date until the Registrant shall file a further amendment which specifically states that this Registration Statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933 or until the Registration Statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

The information in this preliminary prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

Subject to Completion, dated May 7, 2018

PRELIMINARY PROSPECTUS

Shares



COMMON STOCK

We are selling _____ shares of our common stock in this offering. This is our initial public offering and no public market currently exists for our shares. We anticipate that the initial public offering price of our common stock will be between \$ _____ and \$ _____ per share.

We have applied to list our common stock on The NASDAQ Global Market under the symbol "MGTA."

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012, as amended, and, as such, have elected to comply with certain reduced public company reporting requirements for this prospectus and future filings.

Investing in our common stock involves risks. See "[Risk Factors](#)" beginning on page 15.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of this prospectus. Any representation to the contrary is a criminal offense.

	Per share	Total
Public offering price	\$ _____	\$ _____
Underwriting discounts and commissions ⁽¹⁾	\$ _____	\$ _____
Proceeds to us before expenses	\$ _____	\$ _____

(1) We have agreed to reimburse the underwriters for certain FINRA-related expenses, in addition to underwriting discounts and commissions. See "Underwriting."

We have granted the underwriters an option for a period of 30 days from the date of this prospectus to purchase up to _____ additional shares of our common stock at the public offering price, less the underwriting discount.

The underwriters expect to deliver the shares of common stock to purchasers on _____, 2018.

Joint Book-Running Managers

J.P. Morgan

Goldman Sachs & Co. LLC

Cowen

Co-Manager

Wedbush PacGrow

The date of this prospectus is _____, 2018

TABLE OF CONTENTS

	Page
PROSPECTUS SUMMARY	1
THE OFFERING	11
SUMMARY FINANCIAL DATA	13
RISK FACTORS	15
CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS	69
USE OF PROCEEDS	71
DIVIDEND POLICY	72
CAPITALIZATION	73
DILUTION	75
SELECTED FINANCIAL DATA	78
MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS	80
BUSINESS	96
MANAGEMENT	166
EXECUTIVE COMPENSATION	175
CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS	183
PRINCIPAL STOCKHOLDERS	189
DESCRIPTION OF CAPITAL STOCK	192
SHARES ELIGIBLE FOR FUTURE SALE	198
MATERIAL U.S. FEDERAL INCOME TAX CONSIDERATIONS FOR NON-U.S. HOLDERS	200
UNDERWRITING	204
LEGAL MATTERS	211
EXPERTS	211
WHERE YOU CAN FIND MORE INFORMATION	211
INDEX TO FINANCIAL STATEMENTS	F-1

We and the underwriters have not authorized anyone to provide any information other than that contained in this prospectus or in any free writing prospectus prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. We and the underwriters are not making an offer to sell these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus is accurate only as of the date on the front cover of this prospectus. Our business, financial condition, results of operations and prospects may have changed since that date.

This prospectus contains forward-looking statements that are subject to a number of risks and uncertainties, many of which are beyond our control. See "Risk Factors" and "Cautionary Note Regarding Forward-Looking Statements."

Dealer Prospectus Delivery Obligation

Until _____, 2018 (the 25th day after the date of this prospectus), all dealers that effect transactions in these securities, whether or not participating in this offering, may be required to deliver a prospectus. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

For investors outside of the United States: We have not, and the underwriters have not, done anything that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than the United States. Persons outside of the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the shares of common stock and the distribution of this prospectus outside of the United States.

Trademarks and Trade Names

We own or have rights to various trademarks, service marks and trade names that we use in connection with the operation of our business. This prospectus may also contain trademarks, service marks and trade names of third parties, which are the property of their respective owners. Our use or display of third parties' trademarks, service marks, trade names or products in this prospectus is not intended to, and does not imply a relationship with, or endorsement or sponsorship by us. Solely for convenience, the trademarks, service marks and trade names referred to in this prospectus may appear without the ®, TM or SM symbols, but the omission of such references is not intended to indicate, in any way, that we will not assert, to the fullest extent under applicable law, our rights or the right of the applicable owner of these trademarks, service marks and trade names.

PROSPECTUS SUMMARY

Our Business

For more than 50 years, doctors and patients have had difficult conversations about bone marrow transplant: the procedure can save lives and cure patients, however the risks of toxicity and death often deter its use. At Magenta, we believe we can refocus that conversation on the cure and enable many more patients with devastating diseases such as severe autoimmune disorders, including multiple sclerosis; blood cancers, including leukemia; and genetic diseases such as sickle cell disease to benefit from advances in transplant medicine.

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients.

Transplant is a well-established and often curative medical procedure, and emerging data on stem cell gene therapy, which is bone marrow transplant using gene-modified stem cells, suggest the potential for meaningful benefit with this newer form of transplant. Bone marrow transplant and stem cell gene therapies use the same widely-adopted decades-old transplant process. As it exists today, bone marrow transplant is a large market opportunity, and improvements to the current approaches could extend bone marrow transplant to more patients. The ability to treat patients with a bone marrow transplant is limited by the challenge of obtaining sufficient cells to perform the procedure, the inherent morbidity and mortality of current methods used to prepare patients for transplant, and complications following transplant.

At Magenta, we believe we are uniquely positioned to overcome these challenges and to lead a new era in transplant medicine. Our portfolio of product candidates includes biologics, small molecules and a cell therapy designed to address deficiencies in existing approaches and extend the curative power of bone marrow transplant to more patients across many diseases. Currently, only a fraction of eligible patients with these diseases receive a transplant because the risks and challenges outweigh the potential for a cure. These include diseases where bone marrow transplant is a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and autoimmune diseases. Emerging clinical data suggest that bone marrow transplant may represent a breakthrough approach with curative potential for patients with severe autoimmune diseases. For example, recent results from multiple clinical trials show that patients with autoimmune diseases, including multiple sclerosis and scleroderma, can be cured with a transplant. However, based on our epidemiology analyses, currently only approximately 1 to 2% of eligible patients with multiple sclerosis or scleroderma in the United States and Europe receive a bone marrow transplant.

To address the major unmet medical needs in the existing bone marrow transplant process, we are developing a stem cell biology discovery platform and comprehensive portfolio of novel therapeutics. Our programs will improve stem cell dose (expansion), stem cell collection (mobilization), patient preparation for transplant (conditioning), and potential post-transplant complications to address key limitations of the bone marrow transplant process to allow more patients to benefit. Within our expansion program, MGTA-456, our most advanced clinical product candidate, is a cell therapy that has achieved clinical proof of concept in 36 patients with blood cancers and is now being studied in patients with fatal inherited metabolic diseases. MGTA-456 is an expanded cord blood product, and has the potential to allow more patients to have a better chance for a successful stem cell transplant. Within our mobilization program, MGTA-145 is focused on enabling physicians to more easily harvest a greater number of blood stem cells, known as hematopoietic stem cells or HSCs, from patients and donors to improve patient outcomes. Our targeted transplant conditioning programs, which prepare the patient for transplant, are designed to selectively remove stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the decades-old radiation and chemotherapy-based approaches which are still the only available options. Our post-transplant complications program is designed to target the donor immune cells within the patient that cause Graft vs. Host Disease, or GvHD, which can be a fatal complication of transplant.

We intend to become a fully integrated discovery, development and commercial company in the field of transplant medicine. We believe that our product portfolio will offer significant commercial synergies. We are developing our products so that they can each be used individually or in combination with each other. As a result, our portfolio could be utilized in a manner tailored to the patient's disease, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.

Background on Bone Marrow Transplant

Bone marrow is the tissue inside bones where HSCs are located. HSCs produce all of the cells in the blood and immune systems, including: T cells and B cells to fight infections; red blood cells to carry oxygen and platelets to control bleeding. The bone marrow is highly active and gives rise to billions of new cells every day. However, abnormal functioning of the system can lead to serious and sometimes fatal blood and immune diseases. The aim of bone marrow transplant, also called HSC transplant or stem cell transplant, is to replace the diseased blood and immune cells with new stem cells that will produce new blood and immune cells, thereby effectively restoring the blood and immune systems to a healthy state.

Bone Marrow Transplant: The Process and Challenges

A bone marrow transplant procedure utilizes a number of integrated steps, which we explain below: stem cell sourcing and collection, patient conditioning and stem cell infusion and engraftment. All transplants are categorized as either autologous or allogeneic, depending on the source of cells for the transplant. In an autologous transplant, used for conditions such as multiple myeloma, non-Hodgkin lymphoma and autoimmune diseases, the patient's own stem cells are used. This is also the case for stem cell gene therapy. In an allogeneic transplant, used for conditions such as acute leukemia and genetic diseases, patients receive cells from a stem cell donor or umbilical cord blood.

Step 1: Stem Cell Sourcing and Collection

Once the patient and physician agree that bone marrow transplant is the best treatment option, first the source of stem cells must be identified and then the cells are collected. There are three sources of stem cells for transplant: extraction from the bone marrow, mobilization into the peripheral blood and harvesting from umbilical cord blood units. In the case of stem cell gene therapy, once the cells are collected from the patient, they are then modified to either insert a functioning gene or correct a defective gene.

Finding a matched donor and collecting enough stem cells are two significant challenges associated with the first step of bone marrow transplant. It is critical that physicians obtain enough stem cells for the transplant as higher cell doses are closely correlated to better patient outcomes. Although there are more than 25 million registered bone marrow donors worldwide, nearly half of all patients are unable to find a matched donor. Patients without a matched donor require the use of an alternative stem cell source such as unmatched donor or umbilical cord blood, or UCB. Although more than 712,000 units are available in the worldwide cord blood inventory, the number of stem cells in a cord blood unit is low, and fewer than approximately 4% of these units contain enough stem cells for use in adults. Another option, stem cell harvesting, involves multiple invasive bone marrow harvests, or repeated injections, which are often associated with bone pain, nausea, headache and fatigue. It is difficult to predict whether mobilization will be successful, especially in heavily treated blood cancer patients.

Step 2: Conditioning

Once sufficient cells have been obtained, the patient is then conditioned for transplant using systemic, toxic chemotherapy and/or radiation. Depending on the disease and type of transplant, the conditioning treatment is intended to remove or deplete: existing stem cells in the bone marrow, immune cells (T cells and B cells) and/or cancer cells.

Bone marrow transplant conditioning is very burdensome and risky for both pediatric and adult patients. Conditioning treatments today are typically non-targeted and involve systemic, toxic chemotherapy and/or radiation. The current treatments damage the DNA and kill normal, healthy cells in the body, which can lead to severe infections, organ failure, infertility, secondary cancers and even death. Nearly all transplant patients experience complications as a result of current conditioning treatments, and conditioning toxicity is responsible for up to 35% of mortality following allogeneic transplants.

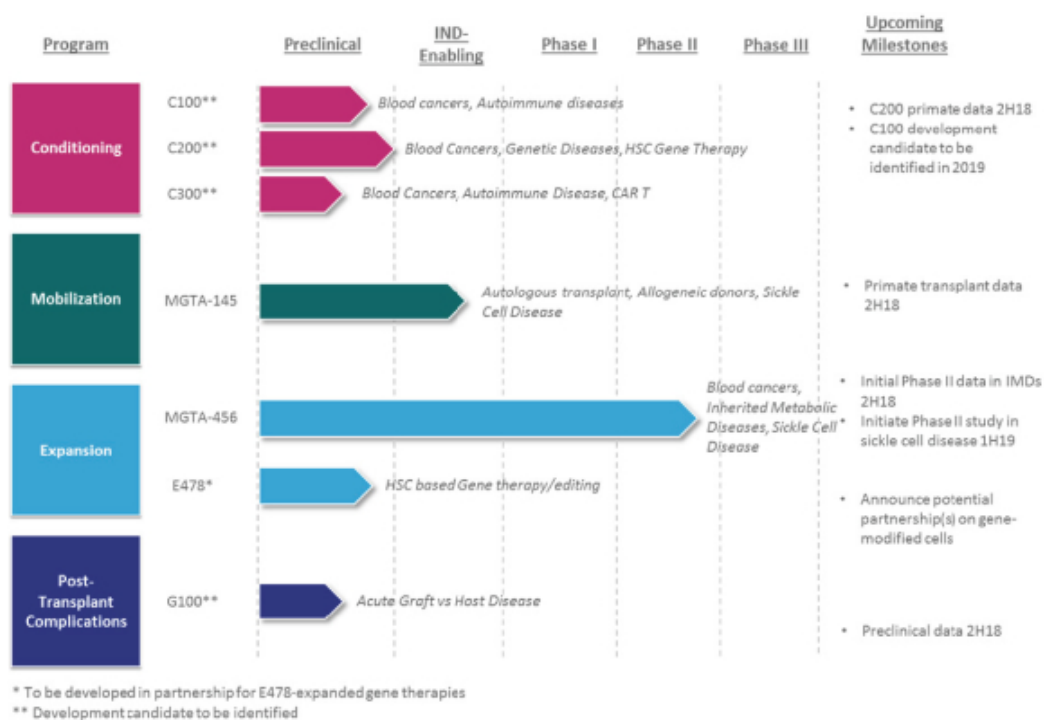
Step 3: Stem Cell Infusion and Engraftment

Once conditioning is complete, the stem cells are infused back into the patient via the bloodstream. The cells travel to and integrate into the bone marrow and begin to make new blood and immune cells, a process referred to as engraftment. Once the bone marrow has made enough blood cells—particularly white blood cells to fight infection—which typically takes several weeks, the patient can be discharged from the hospital.

Some of the common challenges include transplant rejection, delayed engraftment and GvHD. Delayed or failed engraftment can lead to prolonged hospitalization, the need for an additional transplant or death. After engraftment, GvHD can occur. This is when the donor T cells recognize the patient's cells as foreign and attack the patient's tissues and organs, particularly the skin, liver and gastrointestinal system. GvHD accounts for approximately 10% of deaths following allogeneic transplant.

Our Current Program Pipeline

We are developing a pipeline of small molecules; biologics, including antibody drug conjugates; and a cell therapy, which we believe can meaningfully improve and expand curative bone marrow transplant options for many more patients with autoimmune diseases, blood cancers and genetic diseases. Our portfolio of novel medicines for transplant has the potential to allow more patients with debilitating or life-threatening diseases to access a one-time, transformative bone marrow transplant with better outcomes, less risk of toxicity and mortality. We are developing our product candidates so that they can each be used individually or in combination with each other, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey. In addition to our first set of clinical and preclinical product candidates, we are in the process of identifying several other potential candidates from our discovery programs as shown in the below chart. We anticipate that we will have three distinct clinical programs in multiple indications by 2020 with a series of data read-outs.



C100, C200, C300: targeted antibody-drug conjugates for conditioning

We are developing a suite of novel antibody-drug conjugates, or ADCs, for transplant conditioning, a step in the transplant process that is still dominated by the use of systemic chemotherapy agents and radiation. We are seeking to replace these non-targeted toxic conditioning agents with our targeted ADCs. These drugs are designed for transplant and specifically deplete only the cell types required to be eliminated in order to perform a successful transplant. Certain ADCs are currently used to treat cancer by directing a toxin to specific cells. Our programs are adapting this clinically validated modality for conditioning patients for bone marrow transplant.

All of our conditioning programs share an ADC platform but differ in the targeted cell types. The C100 program targets HSCs, immune cells and disease-causing cells, the C200 program targets HSCs and disease-causing cells

and the C300 program targets only immune cells. This is achieved by tuning the antibodies to specific cellular markers or receptors that are expressed on the particular cell types.

	C100	C200	C300
Lead target	CD45	CD117	Undisclosed
Cells removed	Stem and immune cells Disease-causing cells	Stem cells Disease-causing cells	Immune cells
Diseases	Autoimmune diseases Blood cancers	Genetic diseases Genetic diseases (gene therapy) Blood cancers	Autoimmune diseases Blood cancers Blood cancers (CAR T)

Our most advanced conditioning program, C200, is designed to specifically deplete HSCs and disease-causing cells. Our lead target for C200 is CD117, also known as c-Kit, which is highly expressed on HSCs and leukemia cells, making it an ideal target for conditioning across a broad range of diseases. This includes blood cancers as well as hemoglobinopathies like sickle cell disease and beta-thalassemia, with potential applicability in both bone marrow transplant and stem cell gene therapy. We are currently studying ADCs targeting CD117 in non-human primates and expect to submit primate data for presentation at a medical meeting in late 2018. We intend to develop CD117-ADCs initially in patients with acute myelogenous leukemia or myelodysplastic syndrome. We are planning to explore CD117-ADCs in other diseases where patients undergo transplant with gene-modified cells, such as sickle cell disease.

The second conditioning program in our portfolio is C100, under which we are developing ADCs that specifically deplete host HSCs, immune cells and disease-causing cells. Within our C100 program, our lead target is CD45, an important cell surface molecule broadly expressed throughout the hematopoietic and immune systems. We are currently in the lead identification stage for this program and intend to identify a development candidate targeting CD45 in 2019. We plan to develop product candidates under our C100 program for use in patients with leukemias and lymphomas, followed by patients with autoimmune diseases such as multiple sclerosis and scleroderma.

Our third ADC-based conditioning program, C300, targets T cells, a type of immune cell. T cell depletion is currently performed with highly toxic, non-specific drugs, such as fludarabine and cyclophosphamide, which can lead to immune deficiency, infections and other complications including secondary autoimmune reactions. We are pursuing targets expressed on the surfaces of T cells with the goal of offering a safer and more optimized targeted conditioning approach through T cell depletion before CAR T therapy for blood cancers, prevention of stem cell rejection prior to allogeneic bone marrow transplant or achievement of immune system reset before autologous bone marrow transplant in autoimmune disease patients.

MGTA-145: CXCR2 agonist for stem cell mobilization

MGTA-145 is a novel stem cell mobilization product candidate intended to achieve mobilization of high numbers of stem cells in a single day to replace granulocyte colony-stimulating factor, or G-CSF, the current standard of care. G-CSF mobilizes stem cells indirectly and comes with limitations that include a prolonged treatment period of up to one week of injections, lack of efficacy in some patients, and significant bone pain. MGTA-145 is a CXCR2 agonist protein that activates neutrophils to release proteases that cause the release of HSCs into the blood. This novel mechanism of action is complementary to that of plerixafor, another commonly used mobilization agent marketed by Sanofi. The combination of MGTA-145 and plerixafor has been shown to lead to a synergistic, robust and rapid stem cell mobilization in non-human primates. We have initiated

IND-enabling studies of MGTA-145 in combination with plerixafor and expect to file an Investigational New Drug Application, or IND, with the U.S. Food and Drug Administration, or FDA, for this product candidate in 2019. We plan to develop MGTA-145 for mobilization first in patients with multiple myeloma and non-Hodgkin lymphoma, followed by healthy donors for allogeneic transplant. We plan to further investigate MGTA-145 in patient populations where G-CSF can exacerbate the disease such as autoimmune diseases, and patient populations where G-CSF is contra-indicated, such as sickle cell disease.

MGTA-456: aryl hydrocarbon receptor (AHR) antagonist-expanded stem cells

Our most advanced product candidate, MGTA-456, is a novel proprietary allogeneic stem cell therapy that was developed based on the mechanisms that control stem cell growth. The goal of MGTA-456 is to extend the use of cord blood transplant to more patients by increasing the number of stem cells in a single cord blood unit to yield a higher stem cell dose. MGTA-456 has the potential to improve overall survival by allowing more patients to have access to better matched cord blood units, which is associated with better outcomes and lower rates of post-transplant complications.

MGTA-456 has achieved human proof-of-concept in Phase I/II trials in a total of 36 patients with blood cancers. Data from the trials showed that all 36 patients treated with MGTA-456 were successfully transplanted and the median time to transplant recovery was accelerated. We are encouraged by these promising results and looking at blood cancer and other conditions where we believe MGTA-456 may show transformative benefit for patients. These include inherited metabolic diseases, or IMDs, a group of diseases where cord blood transplant is a standard of care but up to 20% of patients with inherited metabolic diseases experience transplant failure, resulting in severe complications, including death. We have initiated a Phase II study of MGTA-456 in patients with inherited metabolic diseases and intend to explore other debilitating diseases where we believe MGTA-456 could bring transformative benefit to patients. We expect to report initial data from our Phase II study in late 2018. We also intend to initiate a Phase II study of MGTA-456 in patients with sickle cell disease in early 2019. On April 11, 2018, we received orphan drug designation from the FDA for MGTA-456 for the enhancement of cell engraftment in patients receiving bone marrow transplant.

We are the sponsor of the IND MGTA-456 in inherited metabolic diseases. The IND was originally filed by Novartis International Pharmaceutical Ltd., or Novartis, on November 6, 2015 and formally transferred to us on July 25, 2017. The IND is active and up to date with reporting requirements, such as annual reports.

We added MGTA-456 to our portfolio through an April 2017 license agreement with Novartis granting us the sole worldwide rights for development and commercialization of cord blood-derived non-gene-edited/-modified HSCs expanded with certain AHR antagonists. See “Business—Licenses and Collaborations” section.

E478: AHR antagonist for expansion of gene-modified stem cells

E478 is our novel and proprietary small molecule AHR antagonist that was developed to increase the number of gene-modified HSCs *ex vivo* for stem cell based-gene therapy. Gene therapy, or bone marrow transplant with gene-modified or genome-edited cells, is a promising treatment approach for several diseases. However, this approach is significantly limited by the inability to generate a sufficient dose of gene-modified HSCs that retain the ability to engraft in patients as well as the costs and complexity of manufacturing viral vectors for gene modification of cells. These constraints could limit the commercial viability of this approach. We have designed E478 to address these issues by expanding the number of gene-modified HSCs using AHR antagonism, the same clinically validated mechanism used to manufacture MGTA-456. We are developing E478 specifically to partner with gene therapy and genome editing companies. E478 would be integrated into our potential partners’ cell-based products leading to a newly defined cell therapy. We believe that E478 could represent a key component

for unlocking the full value of gene therapy by providing each patient with an optimal dose of gene modified cells for rapid and successful engraftment.

G100: ADC program for prevention of acute GvHD

We are developing G100 as a unique approach to preventing acute GvHD, a major complication and a leading cause of death in allogeneic transplant. GvHD occurs when alloreactive T cells in the donor stem cell graft recognize the patient as foreign and attack their tissues. Current treatments for acute GvHD prevention include the prophylactic use of non-specific immune suppressive agents. These treatments cause an increased risk of infection and poor immune function, and despite the use of these powerful immune suppressive agents, approximately 50 to 80% of allogeneic transplant patients experience acute GvHD, depending on the specific indication. Our G100 program is designed to selectively eliminate only the components of the donor graft that cause acute GvHD, specifically the alloreactive T cells. This ADC therapy is intended to be dosed *in vivo* at the time of transplant. By specifically targeting the donor alloreactive T cells that arise shortly after transplant, this therapy should spare the remainder of the patient's immune system to allow immune recovery and protection from infections.

Magenta 2020 Vision

Our goal is to have three clinical programs moving forward in multiple indications by 2020, with a rapidly advancing portfolio and sustainable platform.



Our Team

We have assembled a group of world leaders and pioneers in the fields of stem cell biology, biotherapeutics and transplant medicine. With this team, we are converting recent scientific breakthroughs into a product engine for transplant therapies. Our Chief Executive Officer, Jason Gardner, brings more than 20 years of experience in stem cell science, drug development and business leadership to Magenta. He has created and led successful industry teams, including the Boston R&D Satellite, Center of Excellence for External Drug Discovery and the Regenerative Medicine Unit at GlaxoSmithKline plc. He also worked on the development of approved medicines, Tykerb for breast cancer, and Strimvelis, the first stem cell gene therapy. Michael Cooke, our

Chief Scientific Officer, has more than 20 years of experience in biotechnology and pharmaceutical companies, where he has been responsible for the discovery and development of a portfolio of products to treat autoimmune disease and immune diseases and improve hematopoietic stem cell transplant, including our most advanced program, MGTA-456. Dr. Cooke is an author on more than 60 peer-reviewed publications. Our Chief Medical Officer, John Davis, joined Magenta from Pfizer Inc., where he was Senior Vice President and Head of Early Clinical Development. Prior to Pfizer, Dr. Davis served as Vice President and Global Therapeutic Area Head of Immunology at Baxalta and as Senior Group Director and Head of the Inflammation and Cardiovascular/Metabolism Group in the Early Clinical Development Group at Genentech, Inc. Dr. Davis spent nearly 10 years on faculty at The University of California San Francisco leading clinical research in autoimmune diseases, where he most recently was Professor of Clinical Medicine until 2015. Christina Isacson, our Chief Business Officer, has more than 13 years of experience in senior business development in biotechnology companies and company creation. Dr. Isacson is responsible for our business and corporate development, and the establishment and management of partnerships. Zoran Zdraveski has served as our Chief Legal Officer since April 2017 and is responsible for all aspects of our legal, intellectual property, and compliance functions. Dr. Zdraveski has more than 16 years of experience in the legal field in the biopharmaceutical industry. Our scientific advisory board is chaired by David Scadden, M.D., Gerald and Darlene Jordan Professor of Medicine at Harvard University and one of the world's foremost experts in stem cell biology. The other members of our world-class scientific advisory board include John DiPersio, M.D., Ph.D., of Washington University School of Medicine; Robert Negrin, M.D., of Stanford University; Megan Sykes, M.D., of Columbia University, Alan Tyndall, M.D., formerly of University of Basel; and Luigi Naldini, M.D., Ph.D., of San Raffaele-Telethon Institute for Gene Therapy.

Our Core Values

At Magenta, we are working to revolutionize bone marrow transplants by applying equal parts courage, commitment, and excellence:

- Courage to make a difference for patients, their families, and their healthcare providers
- Commitment to patients, our partners, and one another
- Excellence in everything we do

Our Strategy

Our mission and our culture are centered around the goal of enabling more patients with severe or life-threatening diseases to have access to the transformative benefit of a bone marrow transplant. We intend to provide physicians with a tailored, multi-product treatment regimen based on the disease setting and the individual needs of each patient. Our strategic priorities are as follows:

- Bring the curative power of bone marrow transplant to all patients who can benefit by advancing an integrated product portfolio.
- Build on our deep expertise in stem cell biology to lead a new era in transplant medicine.
- Create a fully integrated patient-focused biotechnology company.
- Commercialize our therapeutics to bring tailored transplant solutions to physicians and patients.
- Leverage our most advanced product candidate, MGTA-456, as a clinical catalyst and commercial beachhead for our portfolio.
- Continue to integrate our innovative collaboration with Be The Match with our science, medicine and business approaches.
- Strategically collaborate to realize the full potential of our portfolio.

Risks Associated with Our Business

Our ability to implement our business strategy is subject to numerous risks that you should be aware of before making an investment decision. These risks are described more fully in the section entitled “Risk Factors” in this prospectus. These risks include, among others:

- we are a clinical-stage company with a limited operating history, have incurred significant losses since our inception, and anticipate that we will continue to incur significant losses for the foreseeable future;
- even if this offering is successful, we will need to raise additional funding before we can expect to generate any revenues from product sales;
- if we are unable to obtain regulatory approval for MGTA-456 or any other product candidates that we may identify or develop, our business will be substantially harmed;
- we are heavily dependent upon the success of MGTA-456, which has just completed a Phase I/II clinical trial and is currently in a separate Phase II clinical trial, and none of our other product candidates are in clinical trials;
- results of earlier studies may not be predictive of future clinical trial results, and we may fail to establish an adequate safety or efficacy profile to conduct advanced clinical trials or obtain regulatory approval for MGTA-456 or any other product candidates that we may pursue;
- if serious adverse events, undesirable side effects, or unexpected characteristics are identified during the development of any of our product candidates, we may need to delay, abandon or limit our further clinical development of those product candidates;
- if we are not able to identify a safe and effective dose for any of our ADCs, we may need to delay, abandon or limit our development of any potential product candidates;
- if we are unable to successfully develop our current programs into a comprehensive portfolio of product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our current and future product candidates;
- we are developing E478 specifically to partner with gene therapy and genome editing companies, and if we are unable to find willing collaborators, this may adversely affect the development of E478 and our business;
- we expect to continue to rely on third parties to manufacture our clinical product supplies, and we intend to rely on third parties to produce and process our product candidates, if approved;
- we are highly dependent on intellectual property licensed from third parties and termination of any of these licenses could result in the loss of significant rights, which would harm our business;
- if we are unable to obtain and maintain sufficient intellectual property protection for MGTA-456, our technologies, or any future product candidates, we may not be able to compete effectively in our markets; and
- our future success depends in part upon our ability to retain our key employees, consultants and advisors and to attract, retain and motivate other qualified personnel.

Corporate History and Information

We were incorporated under the laws of the State of Delaware on June 17, 2015 under the name HSCTCo Therapeutics, Inc. and in February 16, 2016 we changed our name to Magenta Therapeutics, Inc. Our principal executive office is located at 50 Hampshire Street, Cambridge, Massachusetts 02139, and our telephone number is (857) 242-0170. Our website address is www.magentatx.com. We do not incorporate the information on or accessible through our website into this prospectus, and you should not consider any information on, or that can be accessed through, our website as part of this prospectus.

Implications of Being an Emerging Growth Company

We qualify as an “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012, as amended, or the JOBS Act. As an emerging growth company, we may take advantage of specified reduced disclosure and other requirements that are otherwise applicable generally to public companies. These provisions include:

- two years of audited financial statements in addition to any required unaudited interim financial statements with correspondingly reduced “Management’s Discussion and Analysis of Financial Condition and Results of Operations” disclosure;
- reduced disclosure about our executive compensation arrangements;
- no non-binding advisory votes on executive compensation or golden parachute arrangements; and
- exemption from the auditor attestation requirement in the assessment of our internal control over financial reporting.

We may take advantage of these exemptions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company on the date that is the earliest of (i) the last day of the fiscal year in which we have total annual gross revenues of \$1.07 billion or more; (ii) the last day of our fiscal year following the fifth anniversary of the date of the completion of this offering; (iii) the date on which we have issued more than \$1.0 billion in nonconvertible debt during the previous three years; or (iv) the last day of the fiscal year in which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission, or SEC, which means the market value of our common stock that is held by non-affiliates exceeds \$700 million as of the prior June 30th. We may choose to take advantage of some but not all of these exemptions. We have taken advantage of reduced reporting requirements in this prospectus. Accordingly, the information contained herein may be different from the information you receive from other public companies in which you hold stock. We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an emerging growth company, we may rely on certain of these exemptions, including without limitation, providing an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act.

THE OFFERING

Common stock offered by us	shares
Common stock to be outstanding after this offering	shares
Underwriters' option	We have granted the underwriters an option to purchase a maximum of additional shares of common stock from us. The underwriters can exercise this option at any time within 30 days from the date of this prospectus.
Use of Proceeds	We estimate that we will receive net proceeds from the sale of shares of our common stock in this offering of approximately \$ million, or \$ million if the underwriters fully exercise their option to purchase additional shares, assuming an initial public offering price of \$ per share, the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We intend to use the net proceeds from this offering and our existing cash and cash equivalents to fund our conditioning programs and product candidates, the development of MGTA-456, the development of MGTA-145, our mobilization product candidate and the remainder, if any, to fund new and ongoing research and development activities, our new product engine, working capital and other general corporate purposes. See "Use of Proceeds" for additional information.
Risk Factors	You should carefully read the " Risk Factors " section of this prospectus beginning on page 15 and other information included in this prospectus for a discussion of factors that you should consider before deciding to invest in our common stock.
The NASDAQ Global Market symbol	"MGTA"
Directed Share Program	The underwriters have reserved up to % of the shares of common stock being offered by this prospectus (excluding the shares of common stock that may be issued upon the underwriters' exercise of their option to purchase additional common stock) for sale to our directors, officers, employees, business associates and related persons. The number of shares of common stock available for sale to the general public will be reduced to the extent these individuals purchase such reserved shares. Any reserved shares that are not so purchased will be offered by the underwriters to the general public on the same basis as the other shares offered by this prospectus. See "Underwriting—Directed Share Program."

The number of shares of common stock to be outstanding after this offering is based on 71,585,700 shares of common stock outstanding as of April 30, 2018, which includes 4,241,264 shares of unvested restricted stock subject to repurchase by us, after giving effect to the automatic conversion of all outstanding shares of our preferred stock and excludes:

- 4,609,591 shares of common stock issuable upon the exercise of stock options outstanding as of April 30, 2018 under our 2016 Stock Option and Grant Plan, or the 2016 Plan, at a weighted average exercise price of \$2.77 per share;
- 6,749,195 shares of common stock reserved and available for future issuance under the 2016 Plan, as of April 30, 2018; and
- shares of our common stock reserved for future issuance under our 2018 Stock Option and Incentive Plan, or the 2018 Plan, which will become effective upon the completion of this offering, as well as any future increases in the number of shares of common stock reserved for future increases in the number of shares of common stock reserved for future issuances under our 2018 Plan.

Except as otherwise indicated, all information in this prospectus assumes or gives effect to:

- the conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of _____ shares of our common stock upon the completion of this offering;
- no exercise of the outstanding options described above;
- no exercise by the underwriters of their option to purchase up to an additional _____ shares of our common stock in this offering;
- A one-for-_____ reverse split of our common stock, which will become effective prior to the completion of this offering; and
- the filing of our amended and restated certificate of incorporation and the adoption of our amended and restated bylaws, which will occur immediately prior to the completion of this offering.

SUMMARY FINANCIAL DATA

You should read the following summary financial data together with our financial statements and the related notes appearing at the end of this prospectus and the “Selected Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” sections of this prospectus. We have derived the statement of operations data for the years ended December 31, 2016 and 2017 and the balance sheet data as of December 31, 2017 from our audited financial statements appearing at the end of this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future. We have derived the statement of operations data for the three months ended March 31, 2017 and 2018 and the balance sheet data as of March 31, 2018 from our unaudited interim financial statements appearing at the end of this prospectus. The unaudited interim financial statements have been prepared on the same basis as the audited financial statements and reflect, in the opinion of management, all adjustments of a normal, recurring nature that are necessary for a fair statement of the financial information included in those unaudited interim financial statements. Our historical results are not necessarily indicative of the results that may be expected in the future, and the results for the three months ended March 31, 2018 are not necessarily indicative of results to be expected for the full year or any other period.

	Year Ended December 31,		Three Months Ended March 31,	
	2016	2017	2017	2018
	(in thousands, except share and per share data)			
Statement of Operations Data:				
Revenue	\$ —	\$ —	\$ —	\$ —
Operating expenses:				
Research and development	5,782	27,899	3,322	7,849
General and administrative	3,486	7,828	1,489	3,457
Total operating expenses	9,268	35,727	4,811	11,306
Loss from operations	(9,268)	(35,727)	(4,811)	(11,306)
Other income (expense):				
Interest expense	(163)	—	—	—
Interest and other income, net	—	236	—	145
Total other income (expense), net	(163)	236	—	145
Net loss	\$ (9,431)	\$ (35,491)	\$ (4,811)	\$ (11,161)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)	—	—
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)	(354)	—
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634	—	—
Net loss attributable to common stockholders	\$ (9,735)	\$ (35,507)	\$ (5,165)	\$ (11,161)
Net loss per share attributable to common stockholders—basic and diluted	\$ (25.21)	\$ (7.40)	\$ (1.39)	\$ (1.75)
Weighted average common shares outstanding—basic and diluted	386,083	4,798,213	3,716,695	6,373,006
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)		\$ (0.80)		\$ (0.20)
Pro forma weighted average common shares outstanding—basic and diluted (unaudited)		44,294,374		55,551,533

	At March 31, 2018		Pro Forma
	Actual	Pro Forma(2)	As Adjusted(3)
	(in thousands)		
Balance Sheet Data:			
Cash and cash equivalents	\$ 41,462	\$ 93,762	
Working capital(1)	37,134	89,434	
Total assets	46,078	98,378	
Redeemable convertible preferred stock	92,439	—	
Total stockholders' equity (deficit)	(51,854)	92,885	

(1) We define working capital as current assets less current liabilities.

(2) The pro forma balance sheet data give effect to (i) our sale of 11,223,102 shares of Series C redeemable convertible preferred stock in April 2018 for gross proceeds of \$52.3 million and (ii) the automatic conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of 60,401,629 shares of our common stock upon the completion of this offering.

(3) The pro forma as adjusted balance sheet data give further effect to our issuance and sale of shares of our common stock offered in this offering at an assumed initial public offering price of \$ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' equity by \$ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, working capital, total assets and total stockholders' equity by \$ million, assuming no change in the assumed initial public offering price per share and after deducting estimated underwriting discounts and commissions.

RISK FACTORS

Investing in our common stock involves a high degree of risk. You should carefully consider the risks described below, as well as the other information in this prospectus, including our financial statements and the related notes and “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” before deciding whether to invest in our common stock. The occurrence of any of the events or developments described below could harm our business, financial condition, results of operations and growth prospects. In such an event, the market price of our common stock could decline and you may lose all or part of your investment. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations.

Risks Related to Our Financial Position and Need for Additional Capital

We have incurred net losses in every year since our inception and anticipate that we will continue to incur net losses in the future.

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients, and have a limited operating history. Investment in biopharmaceutical product development is highly speculative because it entails substantial upfront capital expenditures and significant risk that any potential product candidate will fail to demonstrate adequate effect or an acceptable safety profile, gain regulatory approval and become commercially viable. We have no products approved for commercial sale and have not generated any revenue from product sales to date, and we continue to incur significant research and development and other expenses related to our ongoing operations. As a result, we are not profitable and have incurred losses in each period since our inception in June 2015. For the years ended December 31, 2016 and 2017 and the three months ended March 31, 2018, we reported a net loss of \$9.4 million, \$35.5 million and \$11.2 million, respectively. As of March 31, 2018, we had an accumulated deficit of \$56.4 million. We expect to continue to incur significant losses for the foreseeable future, and we expect these losses to increase as we continue our research and development of, and seek regulatory approvals for, our product candidates.

Even if we succeed in commercializing one or more of our product candidates, we will continue to incur substantial research and development and other expenditures to develop and market additional product candidates. We may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. The size of our future net losses will depend, in part, on the rate of future growth of our expenses and our ability to generate revenue. Our prior losses and expected future losses have had and will continue to have an adverse effect on our stockholders’ equity and working capital.

We will require additional capital to fund our operations and if we fail to obtain necessary financing, we will not be able to complete the development and commercialization of our product candidates.

Our operations have consumed substantial amounts of cash since inception. We expect to continue to spend substantial amounts to conduct further research and development and preclinical testing and clinical trials of our product candidates, to seek regulatory approvals for our product candidates and to launch and commercialize any product candidates for which we receive regulatory approval, including potentially building our own commercial organization to address the United States, the European Union and certain other markets. As of March 31, 2018, we had approximately \$41.5 million in cash and cash equivalents. In April 2018, we received gross proceeds of \$52.3 million from the sale of our Series C redeemable convertible preferred stock. Based on our current operating plan, we believe that the net proceeds from this offering, together with existing cash and cash equivalents, will be sufficient to fund our anticipated level of operations through at least . However, our future capital requirements and the period for which our existing resources will support our operations may vary significantly from what we expect. Our monthly spending levels will vary based on new and ongoing development and corporate activities. Because the length of time and activities associated with successful

[Table of Contents](#)

development of our product candidates is highly uncertain, we are unable to estimate the actual funds we will require for development and any approved marketing and commercialization activities. Our future funding requirements, both near and long-term, will depend on many factors, including, but not limited to:

- the initiation, progress, timing, costs and results of preclinical studies and clinical trials for our product candidates;
- the clinical development plans we establish for these product candidates;
- the number and characteristics of product candidates that we develop or may in-license;
- the terms of any collaboration agreements we may choose to conclude;
- the outcome, timing and cost of meeting regulatory requirements established by the FDA, the European Medical Agency, or EMA, and other comparable foreign regulatory authorities;
- the cost of filing, prosecuting, defending and enforcing our patent claims and other intellectual property rights;
- the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us or our product candidates;
- the effect of competing technological and market developments;
- the cost and timing of completion of commercial-scale outsourced manufacturing activities; and
- the cost of establishing sales, marketing and distribution capabilities for any product candidates for which we may receive regulatory approval in regions where we choose to commercialize our products on our own.

We cannot be certain that additional funding will be available on acceptable terms, or at all. If we are unable to raise additional capital in sufficient amounts or on terms acceptable to us, we may have to significantly delay, scale back or discontinue the development or commercialization of one or more of our product candidates or one or more of our other research and development initiatives. We also could be required to seek collaborators for one or more of our current or future product candidates at an earlier stage than otherwise would be desirable or on terms that are less favorable than might otherwise be available or relinquish or license on unfavorable terms our rights to technologies or product candidates that we otherwise would seek to develop or commercialize ourselves.

Any of the above events could significantly harm our business, prospects, financial condition and results of operations and cause the price of our common stock to decline.

Raising additional capital may cause dilution to our existing stockholders, restrict our operations or require us to relinquish rights to our technologies or product candidates.

We may seek additional capital through a combination of public and private equity offerings, debt financings, strategic partnerships and alliances and licensing arrangements. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms may include liquidation or other preferences that adversely affect your rights as a stockholder. The incurrence of indebtedness would result in increased fixed payment obligations and could involve certain restrictive covenants, such as limitations on our ability to incur additional debt, limitations on our ability to acquire or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. If we raise additional funds through strategic partnerships and alliances and licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies or product candidates, or grant licenses on terms unfavorable to us.

Our company has a limited operating history and no history of commercializing pharmaceutical products, which may make it difficult to evaluate the prospects for our future viability.

We are an early-stage company. We were founded and commenced operations in June 2015. Our operations to date have been limited to organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying potential product candidates, and undertaking preclinical studies, and in the case of MGTA-456, clinical trials. Aside from MGTA-456, all of our research programs and product candidates are still in the preclinical or research stage of development, and their risk of failure is high. We have not yet demonstrated an ability to initiate or successfully complete any clinical trials (other than for MGTA-456), including large-scale, pivotal clinical trials, obtain marketing approvals, manufacture a commercial-scale medicine, or arrange for a third party to do so on our behalf, or conduct sales and marketing activities necessary for successful commercialization. Typically, it takes about 10 to 15 years to develop a new medicine from the time it is discovered to when it is available for treating patients. Consequently, any predictions you make about our future success or viability may not be as accurate as they could be if we had a longer operating history.

In addition, as a new business, we may encounter unforeseen expenses, difficulties, complications, delays, and other known and unknown factors. We will need to transition from a company with a research focus to a company capable of supporting commercial activities. We may not be successful in such a transition.

We have never generated revenue from product sales and may never be profitable.

Our ability to generate revenue from product sales and achieve profitability depends on our ability, alone or with collaborative partners, to successfully complete the development of, and obtain the regulatory approvals necessary to commercialize product candidates we may identify for development. We may not generate revenues from product sales for the next several years, if ever. Our ability to generate future revenues from product sales depends heavily on our, or our collaborators', ability to successfully:

- identify product candidates and complete research and preclinical and clinical development of any product candidates we may identify;
- seek and obtain regulatory and marketing approvals for any of our product candidates for which we complete clinical trials;
- launch and commercialize any of our product candidates for which we obtain regulatory and marketing approval by establishing a sales force, marketing, and distribution infrastructure or, alternatively, collaborating with a commercialization partner;
- qualify for adequate coverage and reimbursement by government and third-party payors for any of our product candidates for which we obtain regulatory and marketing approval;
- develop, maintain, and enhance a sustainable, scalable, reproducible, and transferable manufacturing process for the product candidates we may develop;
- establish and maintain supply and manufacturing relationships with third parties that can provide adequate, in both amount and quality, products and services to support clinical development and the market demand for any of our product candidates for which we obtain regulatory and marketing approval;
- obtain market acceptance of any product candidates we may develop as viable treatment options;
- address competing technological and market developments;
- implement internal systems and infrastructure, as needed;
- negotiate favorable terms in any collaboration, licensing, or other arrangements into which we may enter and perform our obligations in such collaborations;
- maintain, protect, and expand our portfolio of intellectual property rights, including patents, trade secrets, and know-how;

[Table of Contents](#)

- avoid and defend against third-party interference or infringement claims; and
- attract, hire, and retain qualified personnel.

Even if one or more of the product candidates we may develop is approved for commercial sale, we anticipate incurring significant costs associated with commercializing any approved product candidate. Our expenses could increase beyond expectations if we are required by the FDA, the EMA, or other regulatory authorities to perform clinical and other studies in addition to those that we currently anticipate. Even if we are able to generate revenues from the sale of any approved products, we may not become profitable and may need to obtain additional funding to continue operations.

Comprehensive tax reform legislation could adversely affect our business and financial condition.

The U.S. government has recently enacted comprehensive tax legislation that includes significant changes to the taxation of business entities. These changes include, among others, a permanent reduction to the corporate income tax rate. Notwithstanding the reduction in the corporate income tax rate, the overall impact of this tax reform is uncertain, and our business and financial condition could be adversely affected. This prospectus does not discuss any such tax legislation or the manner in which it might affect purchasers of our common stock. We urge our stockholders to consult with their legal and tax advisors with respect to any such legislation and the potential tax consequences of investing in our common stock.

Our insurance policies may be inadequate and potentially expose us to unrecoverable risks.

We have limited director and officer insurance and commercial insurance policies. Any significant insurance claims would have a material adverse effect on our business, financial condition and results of operations. Insurance availability, coverage terms and pricing continue to vary with market conditions. We endeavor to obtain appropriate insurance coverage for insurable risks that we identify, however, we may fail to correctly anticipate or quantify insurable risks, we may not be able to obtain appropriate insurance coverage, and insurers may not respond as we intend to cover insurable events that may occur. We have observed rapidly changing conditions in the insurance markets relating to nearly all areas of traditional corporate insurance. Such conditions have resulted in higher premium costs, higher policy deductibles, and lower coverage limits. For some risks, we may not have or maintain insurance coverage because of cost or availability.

Risks Related to Product Development and Regulatory Approval

We are very early in our development efforts. All but one of our product candidates, MGTA-456, are still in preclinical development. If we are unable to advance our product candidates to obtain regulatory approval and ultimately commercialize our product candidates, or experience significant delays in doing so, our business will be materially harmed.

We are very early in our development efforts and all but one of our product candidates, MGTA-456, are still in preclinical development. We have only recently completed initial preclinical studies for MGTA-145. Our ability to generate product revenue, which we do not expect will occur for many years, if ever, will depend heavily on the successful development and eventual commercialization of our product candidates, which may never occur. We currently generate no revenue from sales of any product and we may never be able to develop or commercialize a marketable product.

Each of our programs and product candidates will require additional preclinical and clinical development, regulatory approval in multiple jurisdictions, obtaining manufacturing supply, capacity and expertise, building of a commercial organization, substantial investment and significant marketing efforts before we generate any revenue from product sales. Our product candidates must be authorized for marketing by the FDA, or certain other foreign regulatory agencies, such as the EMA, before we may commercialize our product candidates.

[Table of Contents](#)

The success of our product candidates will depend on several factors, including the following:

- successful completion of preclinical studies and successful enrollment and completion of clinical trials, including toxicology studies, biodistribution studies and minimally efficacious dose studies in animals, where applicable, under the FDA's cGCPs, and the FDA's current Good Laboratory Practices, or cGLPs;
- effective Investigational New Drug applications, or INDs, or Clinical Trial Authorisations, or CTAs, that allow commencement of our planned clinical trials or future clinical trials for our product candidates;
- positive results from our future clinical programs that support a finding of safety and effectiveness and an acceptable risk-benefit profile of our product candidates in the intended populations;
- receipt of regulatory approvals from applicable regulatory authorities;
- establishment of arrangements with third-party manufacturers for clinical supply and, where applicable, commercial manufacturing capabilities;
- successful development of our internal manufacturing processes or transfer to larger-scale facilities operated by either a contract manufacturing organization, or CMO, or by us;
- establishment and maintenance of patent and trade secret protection or regulatory exclusivity for our product candidates;
- commercial launch of our product candidates, if and when approved, whether alone or in collaboration with others;
- acceptance of our product candidates, if and when approved, by patients, the medical community and third-party payors;
- effective competition with other therapies;
- establishment and maintenance of healthcare coverage and adequate reimbursement;
- enforcement and defense of intellectual property rights and claims; and
- maintenance of a continued acceptable safety profile of our product candidates following approval.

If we do not succeed in one or more of these factors in a timely manner or at all, we could experience significant delays or an inability to successfully commercialize our product candidates, which would materially harm our business. If we do not receive regulatory approvals for our product candidates, we may not be able to continue our operations.

Our planned clinical trials or those of our collaborators may reveal significant adverse events not seen in our preclinical studies and may result in a safety profile that could inhibit regulatory approval or market acceptance of any of our product candidates.

Before obtaining regulatory approvals for the commercial sale of our product candidates we must demonstrate through lengthy, complex and expensive preclinical testing and clinical trials that our product candidates are both safe and effective for use in each target indication. Clinical testing is expensive and can take many years to complete, and its outcome is inherently uncertain. Failure can occur at any time during the clinical trial process. The results of preclinical studies and early clinical trials of our product candidates may not be predictive of the results of later-stage clinical trials. There is typically an extremely high rate of attrition from the failure of product candidates proceeding through clinical trials. For example, we observed a limited number of serious adverse effects in our existing Phase II clinical trial of MGTA-456 that were considered to be related to the investigational treatment, and there is no guarantee that we will not see more serious adverse effects in the future. Product candidates in later stages of clinical trials may fail to show the desired safety and efficacy profile despite

[Table of Contents](#)

having progressed through preclinical studies and initial clinical trials. A number of companies in the biopharmaceutical industry have suffered significant setbacks in advanced clinical trials due to lack of efficacy or unacceptable safety issues, notwithstanding promising results in earlier trials. Most product candidates that commence clinical trials are never approved as products.

If significant adverse events or other side effects are observed in any of our current or future clinical trials, we may have difficulty recruiting patients to the clinical trial, patients may drop out of our trial, or we may be required to abandon the trial or our development efforts of that product candidate altogether. We, the FDA or other applicable regulatory authorities, or an institutional review board, or IRB, may suspend clinical trials of a product candidate at any time for various reasons, including a belief that subjects in such trials are being exposed to unacceptable health risks or adverse side effects. Some potential therapeutics developed in the biotechnology industry that initially showed therapeutic promise in early-stage studies have later been found to cause side effects that prevented their further development. Even if the side effects do not preclude the drug from obtaining or maintaining marketing approval, undesirable side effects may inhibit market acceptance of the approved product due to its tolerability versus other therapies. Any of these developments could materially harm our business, financial condition and prospects.

Clinical development involves a lengthy and expensive process, with an uncertain outcome. We may incur additional costs or experience delays in completing, or ultimately be unable to complete, the development and commercialization of any product candidates.

With the exception of MGTA-456, our other product candidates are still in the preclinical development stage, and their risk of failure is high. It is impossible to predict when or if any of our programs will prove effective and safe in humans or will receive regulatory approval. Before obtaining marketing approval from regulatory authorities for the sale of any product candidate, we must complete preclinical development and then conduct extensive clinical trials to demonstrate the safety and efficacy of any of our future product candidates in humans. Preclinical and clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. We may be unable to establish clinical endpoints that applicable regulatory authorities would consider clinically meaningful, and a clinical trial can fail at any stage of testing. The outcome of preclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of a clinical trial do not necessarily predict final results. Moreover, preclinical and clinical data are often susceptible to varying interpretations and analyses, and many companies that have believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain marketing approval of their products.

Successful completion of clinical trials is a prerequisite to submitting a new drug application, or NDA, or a biologics license application, or BLA, to the FDA, a Marketing Authorization Application, or MAA, to the EMA and similar approval filings to comparable foreign regulatory authorities, for each product candidate and, consequently, the ultimate approval and commercial marketing of any product candidates. We do not know whether any of our clinical trials will begin or be completed on schedule, if at all.

We may experience delays in completing our preclinical studies and initiating or completing clinical trials. We also may experience numerous unforeseen events during, or as a result of, any future clinical trials that we could conduct that could delay or prevent our ability to receive marketing approval or commercialize our product candidates, including:

- regulators, IRBs, or ethics committees may not authorize us or our investigators to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- we may experience delays in reaching, or fail to reach, agreement on acceptable terms with prospective trial sites and prospective contract research organizations, or CROs, the terms of which can be subject to extensive negotiation and may vary significantly among different CROs and trial sites;

[Table of Contents](#)

- clinical trials of any product candidates may fail to show safety or efficacy, produce negative or inconclusive results and we may decide, or regulators may require us, to conduct additional preclinical studies or clinical trials or we may decide to abandon product development programs;
- the number of patients required for clinical trials of any product candidates may be larger than we anticipate, enrollment in these clinical trials may be slower than we anticipate or participants may drop out of these clinical trials or fail to return for post-treatment follow-up at a higher rate than we anticipate;
- our third-party contractors may fail to comply with regulatory requirements or meet their contractual obligations to us in a timely manner, or at all, or may deviate from the clinical trial protocol or drop out of the trial, which may require that we add new clinical trial sites or investigators;
- we may elect to, or regulators, IRBs or ethics committees may require that we or our investigators, suspend or terminate clinical research or trials for various reasons, including noncompliance with regulatory requirements or a finding that the participants are being exposed to unacceptable health risks;
- the cost of preclinical studies and clinical trials of any product candidates may be greater than we anticipate;
- the supply or quality of our product candidates or other materials necessary to conduct clinical trials of our product candidates may be insufficient or inadequate; and
- our product candidates may have undesirable side effects or other unexpected characteristics, causing us or our investigators, regulators, IRBs or ethics committees to suspend or terminate the trials, or reports may arise from preclinical or clinical testing of other bone marrow transplant and cell-based therapies that raise safety or efficacy concerns about our product candidates.

We could also encounter delays if a clinical trial is suspended or terminated by us, the IRBs of the institutions in which such trials are being conducted, the Data Safety Monitoring Board, or DSMB, for such trial or FDA or other regulatory authorities. Such authorities may impose such a suspension or termination due to a number of factors, including failure to conduct the clinical trial in accordance with regulatory requirements or our clinical protocols, inspection of the clinical trial operations or trial site by FDA or other regulatory authorities resulting in the imposition of a clinical hold, unforeseen safety issues or adverse side effects, failure to demonstrate a benefit from using a product or treatment, failure to establish or achieve clinically meaningful trial endpoints, changes in governmental regulations or administrative actions or lack of adequate funding to continue the clinical trial. For example, in December 2015, prior to our license of MGTA-456 from Novartis International Pharmaceutical Ltd., or Novartis, the FDA imposed a partial clinical hold on the cryopreserved part of the protocol covered by the IND application for MGTA-456 until Novartis demonstrated comparability between the fresh and cryopreserved product. This partial clinical hold was later removed by the FDA in June 2016 when Novartis presented a satisfactory comparability study that included data on cell viability, cell dose, sterility, including functional testing, and animal engraftment activity of the fresh and frozen formulations. We cannot guarantee that we will not be subject to further holds by the FDA or other regulatory authorities in the future. In addition, many of the factors that cause, or lead to, a delay in the commencement or completion of clinical trials may also ultimately lead to the denial of regulatory approval of our product candidates. Further, the FDA or other regulatory authorities may disagree with our clinical trial design and our interpretation of data from clinical trials, or may change the requirements for approval even after they have reviewed and commented on the design for our clinical trials.

Our product development costs will increase if we experience delays in clinical testing or marketing approvals. We do not know whether any of our preclinical studies or clinical trials will begin as planned, will need to be restructured or will be completed on schedule, or at all. Significant preclinical or clinical trial delays also could shorten any periods during which we may have the exclusive right to commercialize our product candidates and may allow our competitors to bring products to market before we do, potentially impairing our ability to successfully commercialize our product candidates and harming our business and results of operations. Any delays in our preclinical or future clinical development programs may harm our business, financial condition and prospects significantly.

We have no experience as a company in obtaining regulatory approval for a drug.

As a company, we have never obtained regulatory approval for, or commercialized, a drug. It is possible that the FDA may refuse to accept any or all future new drug applications, or NDAs, or BLAs for substantive review or may conclude after review of our data that our application is insufficient to obtain regulatory approval for any current or future product candidates. If the FDA does not approve any future NDAs or BLAs, it may require that we conduct additional costly clinical, preclinical or manufacturing validation studies before it will reconsider our applications. Depending on the extent of these or any other FDA-required studies, approval of any NDA or BLA or other application that we submit may be significantly delayed, possibly for several years, or may require us to expend more resources than we have available. Any failure or delay in obtaining regulatory approvals would prevent us from commercializing MGTA-456 or any other product candidate, generating revenues and achieving and sustaining profitability. It is also possible that additional studies, if performed and completed, may not be considered sufficient by the FDA to approve any NDA or other application that we submit. If any of these outcomes occur, we may be forced to abandon the development of our product candidates, which would materially adversely affect our business and could potentially cause us to cease operations. We face similar risks for our applications in foreign jurisdictions.

If serious adverse events, undesirable side effects, or unexpected characteristics are identified during the development of any product candidates we may develop, we may need to abandon or limit our further clinical development of those product candidates.

It is impossible to predict when or if any product candidates we may develop will prove safe in humans. If any product candidates we develop are associated with serious adverse events, or undesirable side effects, or have characteristics that are unexpected, we may need to abandon their development or limit development to certain uses or subpopulations in which the serious adverse events, undesirable side effects or other characteristics are less prevalent, less severe, or more acceptable from a risk-benefit perspective, any of which would have a material adverse effect on our business, financial condition, results of operations, and prospects. It is possible that product candidates that initially showed promise in early stage testing will later have been found to cause side effects that prevent further clinical development of the product candidates.

If we are not able to identify a safe and effective dose for any of our ADCs, we may need to delay, abandon or limit our development of any potential product candidates.

ADCs utilize toxins to kill cells, and we may not be able to identify a safe and effective dose for some of our potential product candidates. ADCs, including those that have received marketing approval, have dose-dependent safety findings that can include liver toxicity, depending on the target of the ADC and the drug used in the conjugate. In addition, ADCs may have other adverse side effects including fatalities. In our ongoing proof of mechanism non-human primate study, with a probe CD117-ADC designed to deplete HSCs, we observed some instances of transient elevation of liver enzymes that were dose- and toxin-dependent. Out of the twelve non-human primates treated with the probe CD117-ADC, one treated with the highest dose was euthanized subsequent to receiving scheduled pain medication before a planned bone marrow aspirate. In addition, one non-human primate in each of the two highest dose groups showed the anticipated signs of bone marrow failure resulting from HSC depletion and were euthanized prior to the end of the study. Although this ongoing study may potentially validate the non-human primate as a suitable model for efficacy and tolerability, if we are not able to ultimately show that optimized C200 program ADCs can deplete HSCs at a safe and effective dose, we may need to delay, abandon or limit the development.

Even if we obtain regulatory approval of any of our product candidates, the approved products may be subject to post-approval studies and will remain subject to ongoing regulatory requirements. If we fail to comply, or if concerns are identified in subsequent studies, our approval could be withdrawn and our product sales could be suspended.

If we are successful at obtaining regulatory approval for MGTA-456 or any of our other product candidates, regulatory agencies in the United States and other countries where a product will be sold may require extensive

additional clinical trials or post-approval clinical trials that are expensive and time-consuming to conduct. In particular, therapeutic products administered for the treatment of certain inherited metabolic diseases, such as Hurler's syndrome and leukodystrophies, are likely to require extensive follow-up studies and close monitoring of patients after regulatory approval has been granted, for any signs of adverse effects that occur over a long period of time. These studies may be expensive and time-consuming to conduct and may reveal side effects or other harmful effects in patients that use our therapeutic products after they are on the market, which may result in the limitation or withdrawal of our drugs from the market. Alternatively, we may not be able to conduct such additional trials, which might force us to abandon our efforts to develop or commercialize certain product candidates. Even if post-approval studies are not requested or required, after our products are approved and on the market, there might be safety issues that emerge over time that require a change in product labeling or that require withdrawal of the product from the market, which would cause our revenue to decline.

Additionally, any products that we may successfully develop will be subject to ongoing regulatory requirements after they are approved. These requirements will govern the manufacturing, packaging, marketing, distribution, and use of our products. If we fail to comply with such regulatory requirements, approval for our products may be withdrawn, and product sales may be suspended. We may not be able to regain compliance, or we may only be able to regain compliance after a lengthy delay, significant expense, lost revenues and damage to our reputation.

Because we are developing product candidates for the treatment of diseases in which there is little clinical experience using new technologies, there is increased risk that the FDA, the EMA, or other regulatory authorities may not consider the endpoints of our clinical trials to provide clinically meaningful results and that these results may be difficult to analyze.

During the regulatory review process, we will need to identify success criteria and endpoints such that the FDA, the EMA, or other regulatory authorities will be able to determine the clinical efficacy and safety profile of any product candidates we may develop. As we are initially seeking to identify and develop product candidates to treat diseases in which there is little clinical experience using new technologies, there is heightened risk that the FDA, the EMA, or other regulatory authorities may not consider the clinical trial endpoints that we propose to provide clinically meaningful results (reflecting a tangible benefit to patients). In addition, the resulting clinical data and results may be difficult to analyze. Even if the FDA does find our success criteria to be sufficiently validated and clinically meaningful, we may not achieve the pre-specified endpoints to a degree of statistical significance. This may be a particularly significant risk for many of the genetically defined diseases for which we plan to develop product candidates because many of these diseases have small patient populations, and designing and executing a rigorous clinical trial with appropriate statistical power is more difficult than with diseases that have larger patient populations. Further, even if we do achieve the pre-specified criteria, we may produce results that are unpredictable or inconsistent with the results of the non-primary endpoints or other relevant data. The FDA also weighs the benefits of a product against its risks, and the FDA may view the efficacy results in the context of safety as not being supportive of regulatory approval. Other regulatory authorities in the European Union and other countries, such as the Committee for Advanced Therapies, or CAT, may make similar comments with respect to these endpoints and data. Any product candidates we may develop will be based on a novel technology that makes it difficult to predict the time and cost of development and of subsequently obtaining regulatory approval.

A Breakthrough Therapy Designation by the FDA, even if granted for any of our product candidates, may not lead to a faster development or regulatory review or approval process and it does not increase the likelihood that our product candidates will receive marketing approval.

We plan to seek a Breakthrough Therapy Designation for our product candidates if the clinical data support such a designation for one or more product candidates. A breakthrough therapy is defined as a drug or biologic that is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening disease or condition and preliminary clinical evidence indicates that the drug, or biologic, may demonstrate

[Table of Contents](#)

substantial improvement over existing therapies on one or more clinically significant endpoints, such as substantial treatment effects observed early in clinical development. For product candidates that have been designated as breakthrough therapies, interaction and communication between the FDA and the sponsor of the trial can help to identify the most efficient path for clinical development while minimizing the number of patients placed in ineffective control regimens. Biologics designated as breakthrough therapies by the FDA may also be eligible for accelerated approval.

Designation as a breakthrough therapy is within the discretion of the FDA. Accordingly, even if we believe one of our product candidates meets the criteria for designation as a breakthrough therapy, the FDA may disagree and instead determine not to make such designation. In any event, the receipt of a Breakthrough Therapy Designation for a product candidate may not result in a faster development process, review or approval compared to drugs considered for approval under non-expedited FDA review procedures and does not assure ultimate approval by the FDA. In addition, even if one or more of our product candidates qualify as breakthrough therapies, the FDA may later decide that the product no longer meets the conditions for qualification.

Our current product candidates and any future product candidates may not be eligible for Orphan Drug status.

The United States and Europe may designate drugs for relatively small patient populations as orphan drugs. Orphan Drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process, but does make the product eligible for orphan drug exclusivity, reduced filing fees and specific tax credits. Generally, if a company receives the first marketing approval for a product with an Orphan Drug designation in the clinical indication for which it has such designation, the product is entitled to orphan drug exclusivity. Orphan drug exclusivity means that the FDA will not approve another application to market the same drug for the same indication, except in limited circumstances, for a period of seven years in the United States. This exclusivity, however, could block the approval of our proposed product candidates if a competitor obtains marketing approval before us. However, even if we obtain orphan drug exclusivity for any of our proposed product candidates, we may not be able to maintain it. For example, if a competitive product is shown to be clinically superior to our product candidates, any orphan drug exclusivity we have will not block the approval of such competitive product.

If we encounter difficulties enrolling patients in our clinical trials, our clinical development activities could be delayed or otherwise adversely affected.

We may experience difficulties in patient enrollment in our clinical trials for a variety of reasons. The timely completion of clinical trials in accordance with their protocols depends, among other things, on our ability to enroll a sufficient number of patients who remain in the study until its conclusion. The enrollment of patients depends on many factors, including:

- the patient eligibility criteria defined in the protocol;
- the size of the patient population required for analysis of the trial's primary endpoints;
- the proximity of patients to study sites;
- the design of the trial;
- our ability to recruit clinical trial investigators with the appropriate competencies and experience;
- our ability to obtain and maintain patient consents; and
- the risk that patients enrolled in clinical trials will drop out of the trials before completion.

In addition, our clinical trials will compete with other clinical trials for product candidates that are in the same therapeutic areas as our product candidates, and this competition will reduce the number and types of patients available to us, because some patients who might have opted to enroll in our trials may instead opt to enroll in a

[Table of Contents](#)

trial being conducted by one of our competitors. Since the number of qualified clinical investigators is limited, we expect to conduct some of our clinical trials at the same clinical trial sites that some of our competitors use, which will reduce the number of patients who are available for our clinical trials in such clinical trial site.

Delays in patient enrollment may result in increased costs or may affect the timing or outcome of the planned clinical trials, which could prevent completion of these trials and adversely affect our ability to advance the development of our product candidates.

We may expend our limited resources to pursue a particular product candidate or indication and fail to capitalize on product candidates or indications that may be more profitable or for which there is a greater likelihood of success.

Because we have limited financial and managerial resources, we focus on research programs and product candidates that we identify for specific indications among many potential options. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to capitalize on viable commercial medicines or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable medicines. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing, or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate. Any such event could have a material adverse effect on our business, financial condition, results of operations, and prospects.

Even if we complete the necessary clinical trials, we cannot predict when, or if, we will obtain regulatory approval to commercialize a product candidate we may develop, and any such approval may be for a more narrow indication than we seek.

We cannot commercialize a product candidate until the appropriate regulatory authorities have reviewed and approved the product candidate. Even if any product candidates we may develop meet their safety and efficacy endpoints in clinical trials, the regulatory authorities may not complete their review processes in a timely manner, or we may not be able to obtain regulatory approval. Additional delays may result if an FDA Advisory Committee or other regulatory authority recommends non-approval or restrictions on approval. In addition, we may experience delays or rejections based upon additional government regulation from future legislation or administrative action, or changes in regulatory authority policy during the period of product development, clinical trials, and the review process.

Regulatory authorities also may approve a product candidate for more limited indications than requested or they may impose significant limitations in the form of narrow indications, warnings or a Risk Evaluation and Mitigation Strategy, or REMS. These regulatory authorities may require precautions or contra-indications with respect to conditions of use, or they may grant approval subject to the performance of costly post-marketing clinical trials. In addition, regulatory authorities may not approve the labeling claims that are necessary or desirable for the successful commercialization of any product candidates we may develop. Any of the foregoing scenarios could materially harm the commercial prospects for any product candidates we may develop and materially adversely affect our business, financial condition, results of operations, and prospects.

A Fast Track Designation by the FDA, even if granted for any of our product candidates, may not lead to a faster development or regulatory review or approval process, and does not increase the likelihood that our product candidates will receive marketing approval.

If a drug is intended for the treatment of a serious or life-threatening condition and the drug demonstrates the potential to address unmet medical needs for this condition, the drug sponsor may apply for FDA Fast Track

[Table of Contents](#)

Designation for a particular indication. Marketing applications filed by sponsors of products in Fast Track development may qualify for priority review under the policies and procedures offered by the FDA, but the Fast Track Designation does not assure any such qualification or ultimate marketing approval by the FDA. Receipt of Fast Track Designation may not result in a faster development process, review or approval compared to drugs considered for approval under conventional FDA procedures. In addition, the FDA may withdraw any Fast Track Designation at any time. We may seek Fast Track Designation for MGTA-456 or any other product candidates, but there is no assurance that the FDA will grant this status to any of our proposed product candidates.

We may seek priority review designation for MGTA-456 or our other product candidates, but we might not receive such designation, and even if we do, such designation may not lead to a faster development or regulatory review or approval process.

If the FDA determines that a product candidate offers a treatment for a serious condition and, if approved, the product would provide a significant improvement in safety or effectiveness, the FDA may designate the product candidate for priority review. A priority review designation means that the goal for the FDA to review an application is six months, rather than the standard review period of ten months. We may request priority review for our product candidates, however, we cannot assume that MGTA-456 or our other product candidates will meet the criteria for that designation. The FDA has broad discretion with respect to whether or not to grant priority review status to a product candidate, so even if we believe a particular product candidate is eligible for such designation or status, the FDA may decide not to grant it. Moreover, a priority review designation does not necessarily mean a faster development or regulatory review or approval process or necessarily confer any advantage with respect to approval compared to conventional FDA procedures. Receiving priority review from the FDA does not guarantee approval within the six-month review cycle or at all.

Results of preclinical studies and early clinical trials may not be predictive of results of future clinical trials, and such results do not guarantee approval of a product candidate by regulatory authorities.

The outcome of preclinical studies and early clinical trials may not be predictive of the success of later clinical trials, and interim results of clinical trials do not necessarily predict success in the results of completed clinical trials. Many companies in the pharmaceutical and biotechnology industries have suffered significant setbacks in late-stage clinical trials after achieving positive results in earlier development, and we could face similar setbacks. The design of a clinical trial can determine whether its results will support approval of a product and flaws in the design of a clinical trial may not become apparent until the clinical trial is well advanced. In addition, preclinical and clinical data are often susceptible to varying interpretations and analyses. Many companies that believed their product candidates performed satisfactorily in preclinical studies and clinical trials have nonetheless failed to obtain regulatory approval for their product candidates. Even if we complete clinical development of MGTA-456, there can be no assurance that the FDA, EMA, or other regulatory authorities will approve MGTA-456 for marketing.

In some instances, there can be significant variability in safety or efficacy results between different clinical trials of the same product candidate due to numerous factors, including changes in trial procedures set forth in protocols, differences in the size and type of the patient populations, changes in and adherence to the dosing regimen and other clinical trial procedures and the rate of dropout among clinical trial participants. If we fail to receive positive results in clinical trials of our product candidates, the development timeline and regulatory approval and commercialization prospects for our most advanced product candidate, and, correspondingly, our business and financial prospects would be negatively impacted.

Our product candidates for which we intend to seek approval may face competition from generic drugs or biosimilars sooner than anticipated.

With the enactment of the Biologics Price Competition and Innovation Act of 2009, or BPCIA, an abbreviated pathway for the approval of biosimilar and interchangeable biological products was created. The abbreviated

[Table of Contents](#)

regulatory pathway establishes legal authority for the FDA to review and approve biosimilar biologics, including the possible designation of a biosimilar as interchangeable based on its similarity to an existing reference product. Under the BPCIA, an application for a biosimilar product cannot be approved by the FDA until 12 years after the original branded product is approved under a BLA. On March 6, 2015, the FDA approved the first biosimilar product under the BPCIA. However, the law is complex and is still being interpreted and implemented by the FDA. As a result, its ultimate impact, implementation, and meaning are subject to uncertainty. While it is uncertain when such processes intended to implement BPCIA may be fully adopted by the FDA, any such processes could have a material adverse effect on the future commercial prospects for our biological products.

We believe that if any of our product candidates are approved as a biological product under a BLA it should qualify for the 12-year period of exclusivity. However, there is a risk that the FDA will not consider any of our product candidates to be reference products for competing products, potentially creating the opportunity for biosimilar competition sooner than anticipated. Additionally, this period of regulatory exclusivity does not apply to companies pursuing regulatory approval via their own traditional BLA, rather than via the abbreviated pathway. Moreover, the extent to which a biosimilar, once approved, will be substituted for any one of our reference products in a way that is similar to traditional generic substitution for non-biological products is not yet clear, and will depend on a number of marketplace and regulatory factors that are still developing. Finally, there has been public discussion of potentially decreasing the period of exclusivity from the current 12 years. If such a change were to be enacted, our product candidates, if approved, could have a shorter period of exclusivity than anticipated.

Enacted and future legislation may increase the difficulty and cost for us to obtain marketing approval of and commercialize our product candidates and may affect the prices we may set.

In the United States and some foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could, among other things, prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any products for which we obtain marketing approval.

For example, in March 2010, the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Reconciliation Act of 2010, or collectively the Affordable Care Act, or the ACA, was enacted to broaden access to health insurance, reduce or constrain the growth of healthcare spending, enhance remedies against fraud and abuse, add new transparency requirements for health care and health insurance industries, impose new taxes and fees on the health industry and impose additional health policy reforms. As implementation of the ACA is ongoing, the law appears likely to continue the downward pressure on pharmaceutical pricing, especially under the Medicare program, and may also increase our regulatory burdens and operating costs.

Moreover, the Drug Supply Chain Security Act imposes new obligations on manufacturers of pharmaceutical products related to product tracking and tracing. Legislative and regulatory proposals have been made to expand post-approval requirements and restrict sales and promotional activities for pharmaceutical products. We are not sure whether additional legislative changes will be enacted, or whether the current regulations, guidance or interpretations will be changed, or what the impact of such changes on our business, if any, may be.

As an early stage small company that will be competing against numerous large, established companies that have substantially greater financial, technical, research manufacturing, marketing, distribution and other resources than us, we will be at a significant competitive disadvantage.

The pharmaceutical and biopharmaceutical industry is characterized by intense competition and rapid and significant technological changes and advancements. Many companies, research institutions and universities are doing research and development work in a number of areas similar to those that we focus on that could lead to the development of new products which could compete with and be superior to our product candidates.

Most of the companies with which we compete have substantially greater financial, technical, research, manufacturing, marketing, distribution and other resources than those of ours. A number of these companies may have or may develop technologies for developing products for treating various diseases, including certain inherited metabolic diseases such as Hurler's syndrome and leukodystrophies, that could prove to be superior to ours. We expect technological developments in the pharmaceutical and biopharmaceutical and related fields to occur at a rapid rate, and we believe competition will intensify as advances in these fields are made. Accordingly, we will be required to continue to devote substantial resources and efforts to research and development activities in order to potentially achieve and maintain a competitive position in this field. Products that we develop may become obsolete before we are able to market them or to recover all or any portion of our research and development expenses. We will be competing with respect to our products with companies that have significantly more experience and expertise in undertaking preclinical testing and human clinical trials with new or improved therapeutic products and obtaining regulatory approvals of such products. A number of these companies already market and may be in advanced phases of clinical testing of various drugs that will or may compete with our current product candidates or other future potential product candidates. Our competitors may develop or commercialize products more rapidly than we do or with significant advantages over any products we develop. Our competitors may therefore be more successful in commercializing their products than we are, which could adversely affect our competitive position and business.

In addition to larger pharmaceutical or biopharmaceutical companies that may develop different competing technologies or technologies within the transplant field, we will be competing with a number of smaller biotechnology companies that are focused on transplant technologies, which may include among others Gamida Cell Ltd., Nohla Therapeutics, Inc., and ExCellThera Inc. We are aware of Novartis' collaboration with Intellia Therapeutics, Inc. which includes efforts relating to expansion of HSCs that have been modified using CRISPR/Cas9 technology to express therapeutic proteins and delivered to patients for the treatment of potential treatment of blood disorders or primary immune deficiencies. Any programs and technology that develop as a result of this collaboration would likely compete directly with our E478 program.

Colleges, universities, governmental agencies and other public and private research organizations are becoming more active in seeking patent protection and licensing arrangements to collect royalties for use of technologies that they have developed, some of which may be directly competitive with our programs and product candidates, including our lead product candidate, MGTA-456.

Risks Related to Manufacturing and Commercialization

We rely on third parties to conduct our preclinical and clinical trials and will rely on them to perform other tasks for us. If these third parties do not successfully carry out their contractual duties, meet expected deadlines or comply with regulatory requirements, we may not be able to obtain regulatory approval for or commercialize our product candidates and our business could be substantially harmed.

Although we have recruited a team that has experience with clinical trials, as a company we have no experience in conducting clinical trials. Moreover, we do not have the ability to independently conduct preclinical studies and clinical trials, and we have relied upon, and plan to continue to rely upon medical institutions, clinical investigators, contract laboratories and other third parties, or our CROs, to conduct preclinical studies and future clinical trials for our product candidates. We expect to rely heavily on these parties for execution of preclinical and future clinical trials for our product candidates and control only certain aspects of their activities. Nevertheless, we will be responsible for ensuring that each of our preclinical and clinical trials is conducted in accordance with the applicable protocol, legal and regulatory requirements and scientific standards and our reliance on CROs will not relieve us of our regulatory responsibilities. For any violations of laws and regulations during the conduct of our preclinical studies and clinical trials, we could be subject to warning letters or enforcement action that may include civil penalties up to and including criminal prosecution.

We and our CROs will be required to comply with regulations, including cGCPs for conducting, monitoring, recording and reporting the results of preclinical and clinical trials to ensure that the data and results are

scientifically credible and accurate and that the trial patients are adequately informed of the potential risks of participating in clinical trials and their rights are protected. These regulations are enforced by the FDA, the Competent Authorities of the Member States of the European Economic Area and comparable foreign regulatory authorities for any drugs in clinical development. The FDA enforces cGCP regulations through periodic inspections of clinical trial sponsors, principal investigators and trial sites. If we or our CROs fail to comply with applicable cGCPs, the clinical data generated in our clinical trials may be deemed unreliable and the FDA or comparable foreign regulatory authorities may require us to perform additional clinical trials before approving our marketing applications. We cannot assure you that, upon inspection, the FDA will determine that any of our future clinical trials will comply with cGCPs. In addition, our clinical trials must be conducted with product candidates produced in accordance with the requirements in cGMP regulations. Our failure or the failure of our CROs to comply with these regulations may require us to repeat clinical trials, which would delay the regulatory approval process and could also subject us to enforcement action.

Although we intend to design our planned clinical trials for our product candidates, for the foreseeable future CROs will conduct all of our planned clinical trials. As a result, many important aspects of our development programs, including their conduct and timing, will be outside of our direct control. Our reliance on third parties to conduct future preclinical studies and clinical trials will also result in less day-to-day control over the management of data developed through preclinical studies and clinical trials than would be the case if we were relying entirely upon our own staff.

If any of our relationships with these third-party CROs terminate, we may not be able to enter into arrangements with alternative CROs. If CROs do not successfully carry out their contractual duties or obligations or meet expected deadlines, if they need to be replaced or if the quality or accuracy of the clinical data they obtain is compromised due to the failure to adhere to our clinical protocols, regulatory requirements or for other reasons, any preclinical studies or clinical trials with which such CROs are associated with may be extended, delayed or terminated. In such cases, we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. As a result, our financial results and the commercial prospects for our product candidates in the subject indication could be harmed, our costs could increase and our ability to generate revenue could be delayed.

The successful development of biopharmaceuticals and cell-based therapies, is highly uncertain.

Successful development of biopharmaceuticals and cell-based therapies, is highly uncertain and is dependent on numerous factors, many of which are beyond our control. Bone marrow transplant and cell-based therapies that appear promising in the early phases of development may fail to reach the market for several reasons including:

- preclinical study results may show the therapies to be less effective than desired or to have harmful or problematic side effects;
- clinical trial results may show the therapies to be less effective than expected (e.g., the trial failed to meet its primary endpoint) or to have unacceptable side effects or toxicities;
- failure to receive the necessary regulatory approvals or a delay in receiving such approvals. Among other things, such delays may be caused by slow enrollment in clinical trials, length of time to achieve study endpoints, additional time requirements for data analysis, or biologics license application, or BLA, preparation, discussions with the FDA, an FDA request for additional preclinical or clinical data, or unexpected safety or manufacturing issues;
- manufacturing costs, formulation issues, pricing or reimbursement issues, or other factors that make the therapy uneconomical; and
- the proprietary rights of others and their competing products and technologies that may prevent the therapy from being commercialized.

Success in preclinical studies and early clinical trials do not ensure that large-scale clinical trials will be successful. The length of time necessary to complete clinical trials and to submit an application for marketing

approval for a final decision by a regulatory authority varies significantly from one therapy to the next, and may be difficult to predict.

Even if we are successful in getting market approval, commercial success of any of our product candidates will also depend in large part on the availability of coverage and adequate reimbursement from third-party payers, including government payers such as the Medicare and Medicaid programs and managed care organizations, which may be affected by existing and future health care reform measures designed to reduce the cost of health care. Third-party payers could require us to conduct additional studies, including post-marketing studies related to the cost effectiveness of a product, to qualify for reimbursement, which could be costly and divert our resources. If government and other health care payers were not to provide adequate coverage and reimbursement levels for any of our products if approved, market acceptance and commercial success would be reduced.

In addition, if one of our product candidates is approved for marketing, we will be subject to significant regulatory obligations regarding the submission of safety and other post-marketing information and reports and registration, and will need to continue to comply (or ensure that our third party providers) comply with the FDA's current Good Manufacturing Practices, or cGMPs, and the FDA's current Good Clinical Practices, or GCPs, for any clinical trials that we conduct post-approval. In addition, there is always the risk that we or a regulatory authority might identify previously unknown problems with a product post-approval, such as adverse events of unanticipated severity or frequency. Compliance with these requirements is costly, and any failure to comply or other issues with our product candidates' post-market approval could have a material adverse effect on our business, financial condition and results of operations.

We may never obtain FDA approval for any of our product candidates in the United States, and even if we do, we may never obtain approval for or commercialize any of our product candidates in any other jurisdiction, which would limit our ability to realize their full market potential.

In order to eventually market any of our product candidates in any particular foreign jurisdiction, we must establish and comply with numerous and varying regulatory requirements on a jurisdiction-by-jurisdiction basis regarding safety and efficacy. Approval by the FDA in the United States, if obtained, does not ensure approval by regulatory authorities in other countries or jurisdictions. In addition, clinical trials conducted in one country may not be accepted by regulatory authorities in other countries, and regulatory approval in one country does not guarantee regulatory approval in any other country. Approval processes vary among countries and can involve additional product testing and validation and additional administrative review periods. Seeking foreign regulatory approval could result in difficulties and costs for us and require additional preclinical studies or clinical trials which could be costly and time-consuming. Regulatory requirements can vary widely from country to country and could delay or prevent the introduction of our products in those countries. The foreign regulatory approval process involves all of the risks associated with FDA approval. We do not have any product candidates approved for sale in any jurisdiction, including international markets, and we do not have experience in obtaining regulatory approval in international markets. If we fail to comply with regulatory requirements in international markets or to obtain and maintain required approvals, or if regulatory approvals in international markets are delayed, our target market will be reduced and our ability to realize the full market potential of our products will be unrealized.

MGTA-456 has been affected by contamination issues in the past, and any future contamination in our or our third parties' manufacturing process, shortages of raw materials or reagents or failure of any of our key suppliers to deliver necessary components of our product candidates could result in delays in our clinical development or marketing schedules.

Given the nature of biologics manufacturing, there is a risk of contamination. For example, prior to our 2017 license of the product candidate from Novartis, our third-party manufacturer for MGTA-456 experienced contaminations, including microbial contaminations, in connection with the clinical manufacture of MGTA-456 which required disposal of contaminated product and led to delays in the manufacturing process. While we have

[Table of Contents](#)

not experienced contamination events in connection with the manufacture of MGTA-456 for our clinical use since licensing the product candidate, we cannot guarantee that we or our third-party vendors will be able to successfully prevent and remediate contaminations in the future in connection with the manufacture of MGTA-456 or our other current or future product candidates. Any contamination could materially adversely affect our or our third-party vendors' ability to produce our product candidates on schedule and could therefore harm our results of operations and cause reputational damage.

The raw materials required in our and our third-party vendors' manufacturing processes are derived from biological sources. We cannot assure you that we or our third-party vendors have, or will be able to obtain on commercially reasonable terms, or at all, sufficient rights to these materials derived from biological sources. Such raw materials are difficult to procure and may also be subject to contamination or recall. A material shortage, contamination, recall, or restriction on the use of biologically derived substances in the manufacture of our product candidates could adversely impact or disrupt the clinical and commercial manufacturing of our product candidates, which could materially and adversely affect our operating results and development timelines.

We rely on third-party suppliers for the supply and manufacture of certain components of our technology and product candidates, including a single supplier in some cases. For example, an affiliate of the University of Minnesota is our only manufacturing partner for MGTA-456, and Bachem Americas, Inc. is currently the sole manufacturer of MGTA-145. See "Business—Licenses and Collaborations" for additional information regarding these relationships. Should our ability to procure the necessary components for our product candidates from our suppliers be compromised, our ability to continuously operate would be impaired until an alternative supplier is sourced, qualified and tested, which could delay or limit our ability to produce a clinical and commercial supply of our product candidates and harm our business.

If we use biological materials in a manner that causes injury, we may be liable for damages.

Our research and development activities involve the use of biological and hazardous materials. Although we believe our safety procedures for handling and disposing of these materials complies with federal, state and local laws and regulations, we cannot entirely eliminate the risk of accidental injury or contamination from the use, storage, handling or disposal of these materials. We do not carry specific biological waste insurance coverage, workers compensation or property and casualty and general liability insurance policies that include coverage for damages and fines arising from biological exposure or contamination. Accordingly, in the event of contamination or injury, we could be held liable for damages or penalized with fines in an amount exceeding our resources, and our clinical trials or regulatory approvals could be suspended or terminated.

Third-party manufacturers and any third-party collaborators may be unable to successfully scale-up manufacturing of MGTA-456 or our other current or future product candidates in sufficient quality and quantity, which would delay or prevent us from developing MGTA-456 or our other product candidates and commercializing approved products, if any.

In order to conduct clinical trials of MGTA-456 and our other current and future product candidates, we will need to work with third-party manufacturers to manufacture them in sufficient quantities. Our manufacturing partners or our third-party collaborators may be unable to successfully increase the manufacturing capacity of MGTA-456 and our other current or future product candidates in a timely or cost-effective manner, or at all. In addition, quality issues may arise during scale-up activities. If our manufacturing partners or collaborators are unable to successfully scale up the manufacture of our current or future product candidates in sufficient quality and quantity, the development, testing, and clinical trials of that product candidate may be delayed or infeasible, and marketing approval or commercial launch of any resulting product may be delayed or not obtained, which could significantly harm our business.

The commercial success of any of our product candidates will depend upon the degree of market acceptance by physicians, patients, third-party payors and others in the medical community.

Even with the requisite approvals from the FDA in the United States, the EMA in the European Union and other regulatory authorities internationally, the commercial success of our product candidates will depend, in part, on the acceptance of physicians, patients and health care payors of our product candidates as medically necessary, cost-effective and safe. Any product that we commercialize may not gain acceptance by physicians, patients, health care payors and others in the medical community. If these products do not achieve an adequate level of acceptance, we may not generate significant product revenue and may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on several factors, including:

- the efficacy, durability and safety of such product candidates as demonstrated in clinical trials;
- the potential and perceived advantages of product candidates over alternative treatments;
- the cost of treatment relative to alternative treatments;
- the clinical indications for which the product candidate is approved by the FDA or the European Commission;
- the willingness of physicians to prescribe new therapies;
- the willingness of the target patient population to try new therapies;
- the prevalence and severity of any side effects;
- product labeling or product insert requirements of the FDA, EMA or other regulatory authorities, including any limitations or warnings contained in a product's approved labeling;
- relative convenience and ease of administration;
- the strength of marketing and distribution support;
- the timing of market introduction of competitive products;
- publicity concerning our products or competing products and treatments; and
- sufficient third-party payor coverage and adequate reimbursement.

Even if a potential product displays a favorable efficacy and safety profile in preclinical studies and clinical trials, market acceptance of the product will not be fully known until after it is launched.

If we are unable to successfully develop our current programs into a comprehensive portfolio of product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our current and future product candidates.

We are developing our product candidates so that they can each be used individually or in combination with each other. In particular, we are focused on a product development strategy that includes leveraging the synergies among a comprehensive portfolio of our product candidates. Our success may depend, in part, on our ability to develop a complementary product portfolio with product candidates that, together or individually, will address the major unmet needs inherent to the existing bone marrow transplant process. Given our limited experience in developing product candidates that have received marketing approval, we may not be successful in developing some of our product candidates. The failure of one of our product candidates to obtain regulatory approval or market acceptance may affect our ability to expand our market opportunities for our other product candidates or programs. Although we may develop product candidates that ultimately obtain marketing approval, if we are unable to successfully develop our current programs into a comprehensive portfolio of product candidates, or experience significant delays in doing so, we may not realize the full commercial potential of our current and future product candidates.

Coverage and reimbursement may be limited or unavailable in certain market segments for our product candidates, if approved, which could make it difficult for us to sell any product candidates or therapies profitably.

The success of our product candidates, if approved, depends on the availability of adequate coverage and reimbursement from third-party payors. In addition, because our product candidates represent new approaches to bone marrow transplant, we cannot be sure that coverage and reimbursement will be available for, or accurately estimate the potential revenue from our product candidates or assure that coverage and reimbursement will be available for any product that we may develop.

Patients who are provided medical treatment for their conditions generally rely on third-party payors to reimburse all or part of the costs associated with their treatment. Adequate coverage and reimbursement from governmental healthcare programs, such as Medicare and Medicaid, and commercial payors are critical to new product acceptance.

Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which drugs and treatments they will cover and the amount of reimbursement. Coverage and reimbursement by a third-party payor may depend upon a number of factors, including the third-party payor's determination that use of a product is:

- a covered benefit under its health plan;
- safe, effective and medically necessary;
- appropriate for the specific patient;
- cost-effective; and
- neither experimental nor investigational.

In the U.S., no uniform policy of coverage and reimbursement for products exists among third-party payors. As a result, obtaining coverage and reimbursement approval of a product from a government or other third-party payor is a time-consuming and costly process that could require us to provide to each payor supporting scientific, clinical and cost-effectiveness data for the use of our products on a payor-by-payor basis, with no assurance that coverage and adequate reimbursement will be obtained. Even if we obtain coverage for a given product, the resulting reimbursement payment rates might not be adequate for us to achieve or sustain profitability or may require co-payments that patients find unacceptably high. Additionally, third-party payors may not cover, or provide adequate reimbursement for, long-term follow-up evaluations required following the use of product candidates. Patients are unlikely to use our product candidates unless coverage is provided and reimbursement is adequate to cover a significant portion of the cost of our product candidates. Because our product candidates may have a higher cost of goods than conventional therapies, and may require long-term follow up evaluations, the risk that coverage and reimbursement rates may be inadequate for us to achieve profitability may be greater. There is significant uncertainty related to insurance coverage and reimbursement of newly approved products. It is difficult to predict at this time what third-party payors will decide with respect to the coverage and reimbursement for our product candidates.

Payment methodologies may be subject to changes in healthcare legislation and regulatory initiatives. For example, the Middle Class Tax Relief and Job Creation Act of 2012 required that the Centers for Medicare & Medicaid Services, the agency responsible for administering the Medicare program, or CMS, reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which served as a base for 2014 and subsequent years. In addition, effective January 1, 2014, CMS also began bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting. Additional state and federal healthcare reform measures are expected to be adopted in the future, any of which could limit the amounts that federal and state governments will pay for healthcare products and services, which could result in reduced demand for certain pharmaceutical products or additional pricing pressures.

Moreover, increasing efforts by governmental and third-party payors in the United States and abroad to cap or reduce healthcare costs may cause such organizations to limit both coverage and the level of reimbursement for newly approved products and, as a result, they may not cover or provide adequate payment for our product candidates. There has been increasing legislative and enforcement interest in the United States with respect to specialty drug pricing practices. Specifically, there have been several recent U.S. Congressional inquiries and proposed federal and state legislation designed to, among other things, bring more transparency to drug pricing, reduce the cost of prescription drugs under Medicare, review the relationship between pricing and manufacturer patient programs, and reform government program reimbursement methodologies for drugs. We expect to experience pricing pressures in connection with the sale of any of our product candidates due to the trend toward managed healthcare, the increasing influence of health maintenance organizations, cost containment initiatives and additional legislative changes.

Ongoing healthcare legislative and regulatory reform measures may have a material adverse effect on our business and results of operations.

Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example:

(i) changes to our manufacturing arrangements; (ii) additions or modifications to product labeling; (iii) the recall or discontinuation of our products; or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

In the United States, there have been and continue to be a number of legislative initiatives to contain healthcare costs. For example, in March 2010, the Affordable Care Act was passed, which substantially changes the way health care is financed by both governmental and private insurers, and significantly impacts the U.S. pharmaceutical industry. The Affordable Care Act, or the ACA, among other things, subjects biological products to potential competition by lower-cost biosimilars, addresses a new methodology by which rebates owed by manufacturers under the Medicaid Drug Rebate Program are calculated for drugs that are inhaled, infused, instilled, implanted or injected, increases the minimum Medicaid rebates owed by manufacturers under the Medicaid Drug Rebate Program and extends the rebate program to individuals enrolled in Medicaid managed care organizations, establishes annual fees and taxes on manufacturers of certain branded prescription drugs, and creates a new Medicare Part D coverage gap discount program, in which manufacturers must agree to offer 50% point-of-sale discounts (which will be increased to 70% effective January 1, 2019) off negotiated prices of applicable brand drugs to eligible beneficiaries during their coverage gap period, as a condition for the manufacturer's outpatient drugs to be covered under Medicare Part D.

Some of the provisions of the ACA have yet to be fully implemented, while certain provisions have been subject to judicial and Congressional challenges, as well as efforts by the Trump administration to repeal or replace certain aspects of the ACA. For example, in Congress, the U.S. House of Representatives passed Affordable Care Act replacement legislation known as the American Health Care Act of 2017 in May 2017, which was not introduced in the Senate. However, The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the "individual mandate." Congress may consider other legislation to repeal or replace certain elements of the Affordable Care Act. In addition, since January 2017, President Trump has signed two Executive Orders designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Further, the Trump administration has concluded that cost-sharing reduction (CSR) payments to insurance companies required under the ACA have not received necessary appropriations from Congress and announced that it will discontinue these payments immediately until such appropriations are made. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA. A bipartisan bill to appropriate funds for CSR payments was introduced in the Senate, but the future of that bill is uncertain. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

Other legislative changes have been proposed and adopted in the United States since the ACA was enacted. On August 2, 2011, the Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least \$1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. This includes aggregate reductions of Medicare payments to providers of 2% per fiscal year. These reductions went into effect on April 1, 2013 and, due to subsequent legislative amendments to the statute, will remain in effect through 2027 unless additional congressional action is taken. On January 2, 2013, the American Taxpayer Relief Act of 2012 was signed into law, which, among other things, further reduced Medicare payments to several types of providers.

These laws, and future state and federal healthcare reform measures may be adopted in the future, any of which may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our product candidates for which we may obtain regulatory approval or the frequency with which any such product candidate is prescribed or used.

European Union drug marketing and reimbursement regulations may materially affect our ability to market and receive coverage for our products in the European member states.

We intend to seek approval to market our product candidates in both the United States and in selected foreign jurisdictions. If we obtain approval in one or more foreign jurisdictions for our product candidates, we will be subject to rules and regulations in those jurisdictions. In some foreign countries, particularly those in the European Union, the pricing of biologics is subject to governmental control and other market regulations which could put pressure on the pricing and usage of our product candidates. In these countries, pricing negotiations with governmental authorities can take considerable time after obtaining marketing approval of a product candidate. In addition, market acceptance and sales of our product candidates will depend significantly on the availability of adequate coverage and reimbursement from third-party payors for our product candidates and may be affected by existing and future health care reform measures.

Much like the Anti-Kickback Statute prohibition in the United States, the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is also prohibited in the European Union. The provision of benefits or advantages to physicians is governed by the national anti-bribery laws of European Union Member States, such as the UK Bribery Act 2010. Infringement of these laws could result in substantial fines and imprisonment.

Payments made to physicians in certain European Union Member States must be publically disclosed. Moreover, agreements with physicians often must be the subject of prior notification and approval by the physician's employer, his or her competent professional organization and/or the regulatory authorities of the individual European Union Member States. These requirements are provided in the national laws, industry codes or professional codes of conduct, applicable in the European Union Member States. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

In addition, in most foreign countries, including the European Economic Area, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. In some countries, we may be required to conduct a clinical study or other studies that compare the cost-effectiveness of any of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. There can be no assurance that any country that has

price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the European Union do not follow price structures of the United States and generally prices tend to be significantly lower. Publication of discounts by third-party payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If pricing is set at unsatisfactory levels or if reimbursement of our products is unavailable or limited in scope or amount, our revenues from sales by us or our strategic partners and the potential profitability of any of our product candidates in those countries would be negatively affected.

European data collection is governed by restrictive regulations governing the use, processing, and cross-border transfer of personal information.

The collection and use of personal health data in the European Union is governed by the provisions of the Data Protection Directive, and as of May 2018 the General Data Protection Regulation, or GDPR. These directive imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, notification of data processing obligations to the competent national data protection authorities and the security and confidentiality of the personal data. The Data Protection Directive and GDPR also impose strict rules on the transfer of personal data out of the European Union to the United States. Failure to comply with the requirements of the Data Protection Directive, the GDPR, and the related national data protection laws of the European Union Member States may result in fines and other administrative penalties. The GDPR introduces new data protection requirements in the European Union and substantial fines for breaches of the data protection rules. The GDPR regulations may impose additional responsibility and liability in relation to personal data that we process and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects.

Laws and regulations governing international operations may preclude us from developing, manufacturing and selling certain products outside of the United States and require us to develop, implement and maintain costly compliance programs.

If we further expand our operations outside of the United States, we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering, authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the United States to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the United States, or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. If we expand our presence outside of the United States, it will require us to dedicate additional resources to comply with these laws, and these laws may preclude us from developing, manufacturing, or selling certain products and product candidates outside of the United States, which could limit our growth potential and increase our development costs.

[Table of Contents](#)

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The Securities and Exchange Commission, or SEC, also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

We currently have no marketing and sales organization and have no experience in marketing products. If we are unable to establish marketing and sales capabilities or enter into agreements with third parties to market and sell our product candidates, we may not be able to generate product revenue.

We currently have no sales, marketing or distribution capabilities and have no experience in marketing products. We intend to develop an in-house marketing organization and sales force, which will require significant capital expenditures, management resources and time. We will have to compete with other pharmaceutical and biotechnology companies to recruit, hire, train and retain marketing and sales personnel.

If we are unable or decide not to establish internal sales, marketing and distribution capabilities, we will pursue collaborative arrangements regarding the sales and marketing of our products, however, there can be no assurance that we will be able to establish or maintain such collaborative arrangements, or if we are able to do so, that they will have effective sales forces. Any revenue we receive will depend upon the efforts of such third parties, which may not be successful. We may have little or no control over the marketing and sales efforts of such third parties and our revenue from product sales may be lower than if we had commercialized our product candidates ourselves. We also face competition in our search for third parties to assist us with the sales and marketing efforts of our product candidates.

There can be no assurance that we will be able to develop in-house sales and distribution capabilities or establish or maintain relationships with third-party collaborators to commercialize any product in the United States or overseas.

Even if we are able to commercialize any product candidates, such products may become subject to unfavorable pricing regulations, third-party reimbursement practices, or healthcare reform initiatives, which would harm our business.

The regulations that govern marketing approvals, pricing, and reimbursement for new medicines vary widely from country to country. In the United States, recently enacted legislation may significantly change the approval requirements in ways that could involve additional costs and cause delays in obtaining approvals. Some countries require approval of the sale price of a medicine before it can be marketed. In many countries, the pricing review period begins after marketing or product licensing approval is granted. In some foreign markets, prescription pharmaceutical pricing remains subject to continuing governmental control even after initial approval is granted. As a result, we might obtain marketing approval for a medicine in a particular country, but then be subject to price regulations that delay our commercial launch of the medicine, possibly for lengthy time periods, and negatively impact the revenues we are able to generate from the sale of the medicine in that country. Adverse pricing limitations may hinder our ability to recoup our investment in one or more product candidates, even if any product candidates we may develop obtain marketing approval.

Our ability to commercialize any medicines successfully also will depend in part on the extent to which reimbursement for these medicines and related treatments will be available from government health administration authorities, private health insurers, and other organizations. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medications they will pay for and establish reimbursement levels. A primary trend in the U.S. healthcare industry and elsewhere is cost containment. Government authorities and third-party payors have attempted to control costs by limiting coverage and the amount of reimbursement for particular medications. Increasingly, third-party payors are requiring that drug companies provide them with predetermined discounts from list prices and are challenging the prices charged for medical products. We cannot be sure that reimbursement will be available for

any medicine that we commercialize and, if reimbursement is available, the level of reimbursement. Reimbursement may impact the demand for, or the price of, any product candidate for which we obtain marketing approval. If reimbursement is not available or is available only to limited levels, we may not be able to successfully commercialize any product candidate for which we obtain marketing approval.

There may be significant delays in obtaining reimbursement for newly approved medicines, and coverage may be more limited than the purposes for which the medicine is approved by the FDA or similar regulatory authorities outside the United States. Moreover, eligibility for reimbursement does not imply that any medicine will be paid for in all cases or at a rate that covers our costs, including research, development, manufacture, sale, and distribution. Interim reimbursement levels for new medicines, if applicable, may also not be sufficient to cover our costs and may not be made permanent. Reimbursement rates may vary according to the use of the medicine and the clinical setting in which it is used, may be based on reimbursement levels already set for lower cost medicines and may be incorporated into existing payments for other services. Net prices for medicines may be reduced by mandatory discounts or rebates required by government healthcare programs or private payors and by any future relaxation of laws that presently restrict imports of medicines from countries where they may be sold at lower prices than in the United States. Third-party payors often rely upon Medicare coverage policy and payment limitations in setting their own reimbursement policies. Our inability to promptly obtain coverage and profitable payment rates from both government-funded and private payors for any approved medicines we may develop could have a material adverse effect on our operating results, our ability to raise capital needed to commercialize medicines, and our overall financial condition.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of our product candidates.

We face an inherent risk of product liability as a result of the clinical testing of our product candidates and will face an even greater risk if we commercialize any products. For example, we may be sued if our product candidates cause or are perceived to cause injury or are found to be otherwise unsuitable during clinical testing, manufacturing, marketing or sale. Any such product liability claims may include allegations of defects in manufacturing, defects in design, a failure to warn of dangers inherent in the product, negligence, strict liability or a breach of warranties. Claims could also be asserted under state consumer protection acts. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our product candidates. Even successful defense would require significant financial and management resources. Regardless of the merits or eventual outcome, liability claims may result in:

- decreased demand for our products;
- injury to our reputation;
- withdrawal of clinical trial participants and inability to continue clinical trials;
- initiation of investigations by regulators;
- costs to defend the related litigation;
- a diversion of management's time and our resources;
- substantial monetary awards to trial participants or patients;
- product recalls, withdrawals or labeling, marketing or promotional restrictions;
- loss of revenue;
- exhaustion of any available insurance and our capital resources;
- the inability to commercialize any product candidate; and
- a decline in our share price.

Our inability to obtain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of products we develop, alone or with collaborators. Although we currently carry \$5,000,000 of clinical trial insurance, the amount of such insurance coverage may not be adequate, we may be unable to maintain such insurance, or we may not be able to obtain additional or replacement insurance at a reasonable cost, if at all. Our insurance policies may also have various exclusions, and we may be subject to a product liability claim for which we have no coverage. We may have to pay any amounts awarded by a court or negotiated in a settlement that exceed our coverage limitations or that are not covered by our insurance, and we may not have, or be able to obtain, sufficient capital to pay such amounts. Even if our agreements with any future corporate collaborators entitle us to indemnification against losses, such indemnification may not be available or adequate should any claim arise.

Failure to obtain marketing approval in foreign jurisdictions would prevent any product candidates we may develop from being marketed in such jurisdictions, which, in turn, would materially impair our ability to generate revenue.

In order to market and sell any product candidates we may develop in the European Union and many other foreign jurisdictions, we or our third-party collaborators must obtain separate marketing approvals and comply with numerous and varying regulatory requirements. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ substantially from that required to obtain FDA approval. The regulatory approval process outside the United States generally includes all of the risks associated with obtaining FDA approval. In addition, in many countries outside the United States, it is required that the product be approved for reimbursement before the product can be approved for sale in that country. We or these third parties may not obtain approvals from regulatory authorities outside the United States on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one regulatory authority outside the United States does not ensure approval by regulatory authorities in other countries or jurisdictions or by the FDA. We may not be able to file for marketing approvals and may not receive necessary approvals to commercialize our medicines in any jurisdiction, which would materially impair our ability to generate revenue.

Foreign governments often impose strict price controls on approved products, which may adversely affect our future profitability in those countries, and the re-importation of drugs to the United States from foreign countries that impose price controls may adversely affect our future profitability.

Frequently foreign governments impose strict price controls on newly approved therapeutic products. If we obtain regulatory approval to sell products in foreign countries, we may be unable to obtain a price that provides an adequate financial return on our investment. Furthermore, legislation in the United States may permit re-importation of drugs from foreign countries into the United States, including re-importation from foreign countries where the drugs are sold at lower prices than in the United States due to foreign government-mandated price controls. Such a practice, especially if it is conducted on a widespread basis, may significantly reduce our potential United States revenues from any drugs that we are able to develop.

Even if we, or any collaborators we may have, obtain marketing approvals for any product candidates we develop, the terms of approvals and ongoing regulation of our products could require the substantial expenditure of resources and may limit how we, or they, manufacture and market our products, which could materially impair our ability to generate revenue.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising, and promotional activities for such medicine, will be subject to continual requirements of and review by the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information and reports, registration and listing requirements, cGMP requirements relating to quality control, quality assurance and corresponding maintenance of records and documents, and requirements regarding the distribution of samples to physicians and recordkeeping. Even if

marketing approval of a product candidate is granted, the approval may be subject to limitations on the indicated uses for which the medicine may be marketed or to the conditions of approval, or contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the medicine.

Accordingly, assuming we, or any collaborators we may have, receive marketing approval for one or more product candidates we develop, we, and such collaborators, and our and their contract manufacturers will continue to expend time, money, and effort in all areas of regulatory compliance, including manufacturing, production, product surveillance, and quality control. If we and such collaborators are not able to comply with post-approval regulatory requirements, we and such collaborators could have the marketing approvals for our products withdrawn by regulatory authorities and our, or such collaborators', ability to market any future products could be limited, which could adversely affect our ability to achieve or sustain profitability. Further, the cost of compliance with post-approval regulations may have a negative effect on our business, operating results, financial condition, and prospects.

Risks Related to Intellectual Property

We are highly dependent on intellectual property licensed from third parties and termination of any of these licenses could result in the loss of significant rights, which would harm our business.

In April 2017, we entered into a license agreement with Novartis pursuant to which we were granted a worldwide license to certain intellectual property rights owned or controlled by Novartis, including patents, patent applications, proprietary information, know-how and other intellectual property, to develop, commercialize and sell one or more therapeutic products comprising MGTA-456 in the field of non-gene-edited/-modified HSCs. In addition, in November 2016, we entered into a license agreement with Harvard University, or Harvard, pursuant to which we were granted a worldwide license to research, develop and commercialize one or more therapeutic products under certain conditioning- and mobilization-related patents and patent applications owned or controlled by Harvard. Furthermore, in March 2018, we entered into a research, development option and license agreement with Heidelberg Pharma Research GmbH, or Heidelberg Pharma, pursuant to which we intend to combine our proprietary antibodies and Heidelberg Pharma's amanitin conjugates platform. We are dependent on the patents, know-how and proprietary technology, licensed from Novartis and Harvard. Furthermore, if we commercialize any products utilizing Heidelberg Pharma's amanitin conjugates platform, we will be dependent on the intellectual property rights we license from Heidelberg Pharma. Any termination of these licenses, or a finding that such intellectual property lacks legal effect, could result in the loss of significant rights and could harm our ability to commercialize MGTA-456, C100, C200, C300, G100, MGTA-145, and other product candidates.

Certain of our license agreements, including our agreements with Novartis, Harvard and Heidelberg Pharma, require us to use diligent efforts or meet development thresholds to maintain the license, including establishing a set timeline for developing and commercializing products. If we fail to comply with the obligations under our license agreements, including payment terms and diligence terms, our licensors may have the right to terminate our agreements, in which event we may not be able to develop, manufacture, market or sell the products covered by our agreements or may face other penalties under our agreements. Such an occurrence could materially adversely affect the value of the product candidate being developed under any such agreement. Termination of our license agreements or reduction or elimination of our rights under them may result in our having to negotiate a new or reinstated agreement, which may not be available to us on equally favorable terms, or at all, which may mean we are unable to develop or commercialize the affected product candidate or cause us to lose our rights under the agreement. In addition with respect to our license agreement with Novartis, Novartis has granted an exclusive license to Intellia Therapeutics, Inc., or Intellia, in the field of gene-modified HSCs under the same intellectual property that Novartis licensed to us. Accordingly, such rights are unavailable to us and in prosecuting, maintaining, enforcing and defending the licensed patents, Novartis may make decisions that may not be in our best interest. Moreover, if Novartis or Intellia take any action with respect to the licensed patents that results in a successful challenge to the licensed patents by any third party, such patents may be invalidated or held to be unenforceable and we may lose our rights under such patents, which would harm our business. See the

section entitled “Business—Licenses and Collaborations” for additional information regarding our license agreements.

Further, the agreements under which we currently license intellectual property or technology from third parties are complex, and certain provisions in such agreements may be susceptible to multiple interpretations. Accordingly, disputes may arise between us and our licensor, our licensor and its licensors, regarding intellectual property subject to a license agreement, including those relating to:

- the scope of rights, if any, granted under the license agreement and other interpretation-related issues;
- whether and the extent to which our technology and processes infringe on intellectual property of the licensor that is not subject to the license agreement;
- whether our licensor or its licensor had the right to grant the license agreement;
- whether third parties are entitled to compensation or equitable relief, such as an injunction, for our use of the intellectual property without their authorization;
- our right to sublicense patent and other rights to third parties under collaborative development relationships;
- whether we are complying with our obligations with respect to the use of the licensed technology in relation to our development and commercialization of product candidates;
- our involvement in the prosecution of the licensed patents and our licensors’ overall patent enforcement strategy;
- the allocation of ownership of inventions and know-how resulting from the joint creation or use of intellectual property by our licensors and by us and our partners; and
- the amounts of royalties, milestones or other payments due under the license agreement.

The resolution of any contract interpretation disagreement that may arise could narrow what we believe to be the scope of our rights to the relevant intellectual property or technology, or increase what we believe to be our financial or other obligations under the relevant agreement. If disputes over intellectual property that we have licensed prevent or impair our ability to maintain our current licensing arrangements on acceptable terms, or are insufficient to provide us the necessary rights to use the intellectual property, we may be unable to successfully develop and commercialize the affected product candidates. If we or any such licensors fail to adequately protect this intellectual property, our ability to commercialize our products could suffer. Any disputes with our licensors or any termination of the licenses on which we depend could have a material adverse effect on our business, financial condition, results of operations and prospects.

Our commercial success depends on our ability to obtain, maintain and protect our intellectual property and proprietary technology.

Our commercial success depends in large part on our ability to obtain, maintain and protect intellectual property protection through patents, trademarks, and trade secrets in the United States and other countries with respect to our proprietary product candidates. If we do not adequately protect our intellectual property rights, competitors may be able to erode, negate or preempt any competitive advantage we may have, which could harm our business and ability to achieve profitability.

To protect our proprietary position, we have submitted patent applications and may file other patent applications in the United States or abroad related to our product candidates that are important to our business. Although we in-license certain issued patents from Novartis related to our MGTA-456 product candidate, we do not own any issued patents related to our product candidates in any major market and most of the patent applications that we own in the United States are provisional patent applications. Provisional patent applications are not eligible to

become issued patents until, among other things, we file a non-provisional patent application within 12 months of the filing of one or more of our related provisional patent applications. If we do not timely file any non-provisional patent applications, we may lose our priority date with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. While we intend to timely file non-provisional patent applications relating to our provisional patent applications, we cannot predict whether any such patent applications will result in the issuance of patents that provide us with any competitive advantage. Moreover, the patent application and approval process is expensive and time-consuming. We may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

In some instances, agreements through which we license patent rights may not give us control over patent prosecution or maintenance, so that we may not be able to control which claims or arguments are presented, how claims are amended, and may not be able to secure, maintain, or successfully enforce necessary or desirable patent protection from those patent rights. We have not had and do not have primary control over patent prosecution and maintenance for certain of the patents and patent applications we license, including under our agreement with Novartis, and therefore cannot guarantee that these patents and applications will be prosecuted or maintained in a manner consistent with the best interests of our business. We cannot be certain that patent prosecution and maintenance activities by our licensors have been or will be conducted in compliance with applicable laws and regulations or will result in valid and enforceable patents. Moreover, some of our in-licensed patents and patent applications are, and our future owned and licensed patents may be, co-owned with third parties. If we are unable to obtain an exclusive license to any such third party co-owners' interest in such patents or patent applications, such co-owners may be able to license their rights to other third parties, including our competitors, and our competitors could market competing products and technology. In addition, we may need the cooperation of any such co-owners of our patents in order to enforce such patents against third parties, and such cooperation may not be provided to us.

If the scope of the patent protection we or our licensors obtain is not sufficiently broad, we may not be able to prevent others from developing and commercializing technology and products similar or identical to ours. The degree of patent protection we require to successfully compete in the marketplace may be unavailable or severely limited in some cases and may not adequately protect our rights or permit us to gain or keep any competitive advantage. We cannot provide any assurances that any of our licensed patents have, or that any of our pending owned or licensed patent applications that mature into issued patents will include, claims with a scope sufficient to protect our product candidates or otherwise provide any competitive advantage, nor can we assure you that our licenses will remain in force. Other parties have developed or may develop technologies that may be related or competitive with our approach, and may have filed or may file patent applications and may have been issued or may be issued patents with claims that overlap or conflict with our patent applications, either by claiming the same compounds, formulations or methods or by claiming subject matter that could dominate our patent position. In addition, the laws of foreign countries may not protect our rights to the same extent as the laws of the United States. Furthermore, patents have a limited lifespan. In the United States, the natural expiration of a patent is generally twenty years after it is filed. Various extensions may be available; however, the life of a patent, and the protection it affords, is limited. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized. As a result, our patent portfolio may not provide us with adequate and continuing patent protection sufficient to exclude others from commercializing products similar to our product candidates. In addition, the patent portfolio licensed to us is, or may be, licensed to third parties, such as outside our field, and such third parties may have certain enforcement rights. Thus, patents licensed to us and any patents we own in the future could be put at risk of being invalidated or interpreted narrowly in litigation filed by or against another licensee or in administrative proceedings brought by or against another licensee in response to such litigation or for other reasons.

The patent protection we obtain for our product candidates may not be sufficient enough to provide us with any competitive advantage or our patents may be challenged.

Our owned and licensed patents and pending patent applications, if issued, may not provide us with any meaningful protection or prevent competitors from designing around our patent claims to circumvent our patents by developing similar or alternative technologies or therapeutics in a non-infringing manner. For example, a third party may develop a competitive therapy that provides benefits similar to one or more of our product candidates but falls outside the scope of our patent protection or license rights. If the patent protection provided by the patents and patent applications we hold or pursue with respect to our product candidates is not sufficiently broad to impede such competition, our ability to successfully commercialize our product candidates could be negatively affected, which would harm our business. Currently, a significant portion of our patents and patent applications are in-licensed, though similar risks would apply to any patents or patent applications that we now own or may own or in-license in the future.

We, or any future partners, collaborators, or licensees, may fail to identify patentable aspects of inventions made in the course of development and commercialization activities before it is too late to obtain patent protection on them. Therefore, we may miss potential opportunities to strengthen our patent position.

It is possible that defects of form in the preparation or filing of our patents or patent applications may exist, or may arise in the future, for example with respect to proper priority claims, inventorship, claim scope, or requests for patent term adjustments. If we or our partners, collaborators, licensees, or licensors, whether current or future, fail to establish, maintain or protect such patents and other intellectual property rights, such rights may be reduced or eliminated. If our partners, collaborators, licensees, or licensors, are not fully cooperative or disagree with us as to the prosecution, maintenance or enforcement of any patent rights, such patent rights could be compromised. If there are material defects in the form, preparation, prosecution, or enforcement of our patents or patent applications, such patents may be invalid and/or unenforceable, and such applications may never result in valid, enforceable patents. Any of these outcomes could impair our ability to prevent competition from third parties, which may have an adverse impact on our business.

The patent position of biotechnology and pharmaceutical companies carries uncertainty. In addition, the determination of patent rights with respect to pharmaceutical compounds commonly involves complex legal and factual questions, which are dependent upon the current legal and intellectual property context, extant legal precedent and interpretations of the law by individuals. As a result, the issuance, scope, validity, enforceability and commercial value of our patent rights are characterized by uncertainty.

Pending patent applications cannot be enforced against third parties practicing the technology claimed in such applications unless and until a patent issues from such applications. Assuming the other requirements for patentability are met, currently, the first to file a patent application is generally entitled to the patent. However, prior to March 16, 2013, in the United States, the first to invent was entitled to the patent. Publications of discoveries in the scientific literature often lag behind the actual discoveries, and patent applications in the United States and other jurisdictions are not published until 18 months after filing, or in some cases not at all. Therefore, we cannot be certain that we were the first to make the inventions claimed in our patents or pending patent applications, or that we were the first to file for patent protection of such inventions. Similarly, we cannot be certain that parties from whom we do or may license or purchase patent rights were the first to make relevant claimed inventions, or were the first to file for patent protection for them. If third parties have filed prior patent applications on inventions claimed in our patents or applications that were filed on or before March 15, 2013, an interference proceeding in the United States can be initiated by such third parties to determine who was the first to invent any of the subject matter covered by the patent claims of our applications. If third parties have filed such prior applications after March 15, 2013, a derivation proceeding in the United States can be initiated by such third parties to determine whether our invention was derived from theirs.

Moreover, because the issuance of a patent is not conclusive as to its inventorship, scope, validity or enforceability, our owned and licensed patents or pending patent applications may be challenged in the courts or

patent offices in the United States and abroad. There is no assurance that all of the potentially relevant prior art relating to our patents and patent applications has been found. If such prior art exists, it may be used to invalidate a patent, or may prevent a patent from issuing from a pending patent application. For example, such patent filings may be subject to a third-party submission of prior art to the U.S. Patent and Trademark Office, or USPTO, or to other patent offices around the world. Alternately or additionally, we may become involved in post-grant review procedures, oppositions, derivation proceedings, *ex parte* reexaminations, *inter partes* review, supplemental examinations, or interference proceedings or challenges in district court, in the United States or in various foreign patent offices, including both national and regional, challenging patents or patent applications in which we have rights, including patents on which we rely to protect our business. An adverse determination in any such challenges may result in loss of the patent or in patent or patent application claims being narrowed, invalidated or held unenforceable, in whole or in part, or in denial of the patent application or loss or reduction in the scope of one or more claims of the patent or patent application, any of which could limit our ability to stop others from using or commercializing similar or identical technology and products, or limit the duration of the patent protection of our technology and products. In addition, given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such candidates might expire before or shortly after such candidates are commercialized.

Pending and future patent applications may not result in patents being issued that protect our business, in whole or in part, or which effectively prevent others from commercializing competitive products. Competitors may also be able to design around our patents. Changes in either the patent laws or interpretation of the patent laws in the United States and other countries may diminish the value of our patents or narrow the scope of our patent protection. In addition, the laws of foreign countries may not protect our rights to the same extent or in the same manner as the laws of the United States. For example, patent laws in various jurisdictions, including significant commercial markets such as Europe, restrict the patentability of methods of treatment of the human body more than United States law does. If these developments were to occur, they could have a material adverse effect on our ability to generate revenue.

The patent application process is subject to numerous risks and uncertainties, and there can be no assurance that we or any of our future development partners will be successful in protecting our product candidates by obtaining and defending patents. These risks and uncertainties include the following:

- the USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other provisions during the patent process. There are situations in which noncompliance can result in abandonment or lapse of a patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. In such an event, competitors might be able to enter the market earlier than would otherwise have been the case;
- patent applications may not result in any patents being issued;
- patents that may be issued or in-licensed may be challenged, invalidated, modified, revoked, circumvented, found to be unenforceable or otherwise may not provide any competitive advantage;
- our competitors, many of whom have substantially greater resources and many of whom have made significant investments in competing technologies, may seek or may have already obtained patents that will limit, interfere with or eliminate our ability to make, use, and sell our potential product candidates;
- there may be significant pressure on the U.S. government and international governmental bodies to limit the scope of patent protection both inside and outside the United States for disease treatments that prove successful, as a matter of public policy regarding worldwide health concerns; and
- countries other than the United States may have patent laws less favorable to patentees than those upheld by U.S. courts, allowing foreign competitors a better opportunity to create, develop and market competing product candidates.

Issued patents that we have or may obtain or license may not provide us with any meaningful protection, prevent competitors from competing with us or otherwise provide us with any competitive advantage. Our competitors

may be able to circumvent our patents by developing similar or alternative technologies or products in a non-infringing manner. Our competitors may also seek approval to market their own products similar to or otherwise competitive with our products. Alternatively, our competitors may seek to market generic versions of any approved products by submitting Abbreviated New Drug Applications, or ANDAs, to the FDA in which they claim that patents owned or licensed by us are invalid, unenforceable or not infringed. In these circumstances, we may need to defend or assert our patents, or both, including by filing lawsuits alleging patent infringement. In any of these types of proceedings, a court or other agency with jurisdiction may find our patents invalid or unenforceable, or that our competitors are competing in a non-infringing manner. Thus, even if we have valid and enforceable patents, these patents still may not provide protection against competing products or processes sufficient to achieve our business objectives. Any of the foregoing could have a material adverse effect on our business, financial condition, results of operations and prospects.

If we are unable to protect the confidentiality of our trade secrets, our business and competitive position may be harmed.

In addition to the protection afforded by patents, we rely upon unpatented trade secret protection, unpatented know-how and continuing technological innovation to develop and maintain our competitive position. We seek to protect our proprietary technology and processes, in part, by entering into confidentiality agreements with our contractors, collaborators, scientific advisors, employees and consultants and invention assignment agreements with our consultants and employees. However, we may not obtain these agreements in all circumstances, and individuals with whom we have these agreements may not comply with their terms. The assignment of intellectual property rights under these agreements may not be self-executing or the assignment agreements may be breached, and we may be forced to bring claims against third parties, or defend claims that they may bring against us, to determine the ownership of what we regard as our intellectual property. In addition, we may not be able to prevent the unauthorized disclosure or use of our technical know-how or other trade secrets by the parties to these agreements despite the existence generally of confidentiality agreements and other contractual restrictions. Monitoring unauthorized uses and disclosures is difficult and we do not know whether the steps we have taken to protect our proprietary technologies will be effective. If any of the contractors, collaborators, scientific advisors, employees and consultants who are parties to these agreements breaches or violates the terms of any of these agreements, we may not have adequate remedies for any such breach or violation. As a result, we could lose our trade secrets. Enforcing a claim against a third party that illegally obtained and is using our trade secrets, like patent litigation, is expensive and time-consuming and the outcome is unpredictable. In addition, courts outside the United States are sometimes less willing or unwilling to protect trade secrets.

Moreover, our trade secrets could otherwise become known or be independently discovered by our competitors or other third parties. Competitors and other third parties could purchase our product candidates and attempt to replicate some or all of the competitive advantages we derive from our development efforts, willfully infringe our intellectual property rights, design around our protected technology or develop their own competitive technologies that fall outside of our intellectual property rights. If any of our trade secrets were to be lawfully obtained or independently developed by a competitor or other third party, we would have no right to prevent them, or those to whom they communicate it, from using that technology or information to compete with us. If our trade secrets are not adequately protected or sufficient to provide an advantage over our competitors, our competitive position could be adversely affected, as could our business. Additionally, if the steps taken to maintain our trade secrets are deemed inadequate, we may have insufficient recourse against third parties for misappropriating our trade secrets.

Third-party claims of intellectual property infringement, misappropriation or other violations may prevent or delay our product discovery and development efforts and have a material adverse effect on our business.

Our commercial success depends in part on our avoiding infringement, misappropriation and other violations of the patents and proprietary rights of third parties. There is a substantial amount of litigation involving patents and other intellectual property rights in the biotechnology and pharmaceutical industries, as well as administrative

[Table of Contents](#)

proceedings for challenging patents, including interference and reexamination proceedings before the USPTO or oppositions and other comparable proceedings in foreign jurisdictions. Recently, under U.S. patent reform, new procedures including *inter partes* review and post grant review have been implemented. As stated above, this reform will bring uncertainty to the possibility of challenge to our patents in the future. Numerous U.S. and foreign issued patents and pending patent applications, which are owned by third parties, exist in the fields in which we are developing our product candidates. As the biotechnology and pharmaceutical industries expand and more patents are issued, the risk increases that our product candidates may give rise to claims of infringement of the patent rights of others.

Third parties may assert that we are employing their proprietary technology without authorization. For example, we are aware of certain patent applications owned by a third party with claims that if issued in their present form could be construed to cover C200. If such patent claims are issued, the third party may seek to allege that our development and commercialization of C200 infringes such patents and file a patent infringement lawsuit against us in the future. While we believe we would have valid defenses against any such allegation or lawsuit, such defenses may be unsuccessful. In this regard, patents issued in the U.S. by law enjoy a presumption of validity that can be rebutted only with evidence that is “clear and convincing,” a heightened standard of proof. There may also be third-party patents of which we are currently unaware with claims to materials, formulations, methods of manufacture or methods for treatment related to the use or manufacture of our product candidates. Because patent applications can take many years to issue, there may be currently pending patent applications which may later result in issued patents that our product candidates may infringe. In addition, third parties may obtain patents in the future and claim that use of our technologies infringes upon these patents. If any third-party patents were held by a court of competent jurisdiction to cover the manufacturing process of our product candidates, constructs or molecules used in or formed during the manufacturing process, or any final product itself, the holders of any such patents may be able to block our ability to commercialize the product candidate unless we obtained a license under the applicable patents, or until such patents expire or they are finally determined to be held invalid or unenforceable. Similarly, if any third-party patent were held by a court of competent jurisdiction to cover aspects of our formulations, processes for manufacture or methods of use, including combination therapy or patient selection methods, the holders of any such patent may be able to block our ability to develop and commercialize the product candidate unless we obtained a license or until such patent expires or is finally determined to be held invalid or unenforceable. In either case, such a license may not be available on commercially reasonable terms or at all. Even if we obtained such a license, it may only be non-exclusive, which would permit third parties to use the same intellectual property and compete with us. If we are unable to obtain a necessary license to a third-party patent on commercially reasonable terms, or at all, we may be unable to commercialize our product candidates or such efforts may be impaired or delayed, which could in turn significantly harm our business.

Parties making claims against us may seek and obtain injunctive or other equitable relief, which could effectively block our ability to further develop and commercialize our product candidates. Defense of these claims, regardless of their merit, would involve substantial litigation expense and would be a substantial diversion of employee resources from our business. We may not have sufficient resources to bring these actions to a successful conclusion. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of shares of our common stock.

In the event of a successful claim of infringement against us, we may have to pay substantial damages, including treble damages and attorneys’ fees for willful infringement, obtain one or more licenses from third parties, pay royalties or redesign our infringing products, which may be impossible or require substantial time and monetary expenditure. We cannot predict whether any such license would be available at all or whether it would be available on commercially reasonable terms. Furthermore, even in the absence of litigation, we may need to obtain licenses from third parties to advance our research or allow commercialization of our product candidates. We may fail to obtain any of these licenses at a reasonable cost or on reasonable terms, if at all. In that event, we would be unable to further develop and commercialize our product candidates, which could harm our business

significantly. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

Obtaining and maintaining our patent protection depends on compliance with various procedural, document submission, fee payment and other requirements imposed by governmental patent agencies, and our patent protection could be reduced or eliminated for non-compliance with these requirements.

Periodic maintenance fees on any issued patent are due to be paid to the USPTO and foreign patent agencies in several stages over the lifetime of the patent. The USPTO and various foreign governmental patent agencies require compliance with a number of procedural, documentary, fee payment and other similar provisions during the patent application process. While an inadvertent lapse can in many cases be cured by payment of a late fee or by other means in accordance with the applicable rules, there are situations in which noncompliance can result in abandonment or lapse of the patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Noncompliance events that could result in abandonment or lapse of a patent or patent application include, but are not limited to, failure to respond to official actions within prescribed time limits, non-payment of fees and failure to properly legalize and submit formal documents. In such an event, our competitors might be able to enter the market, which would have a material adverse effect on our business.

Some intellectual property that we have in-licensed may have been discovered through government funded programs and thus may be subject to federal regulations such as “march-in” rights, certain reporting requirements and a preference for U.S.-based companies. Compliance with such regulations may limit our exclusive rights, and limit our ability to contract with non-U.S. manufacturers.

Many of the intellectual property rights we have licensed are generated through the use of U.S. government funding and are therefore subject to certain federal regulations. As a result, the U.S. government may have certain rights to intellectual property embodied in our current or future product candidates pursuant to the Bayh-Dole Act of 1980, or Bayh-Dole Act. These U.S. government rights in certain inventions developed under a government-funded program include a non-exclusive, non-transferable, irrevocable worldwide license to use inventions for any governmental purpose. In addition, the U.S. government has the right to require us to grant exclusive, partially exclusive, or non-exclusive licenses to any of these inventions to a third party if it determines that: (i) adequate steps have not been taken to commercialize the invention; (ii) government action is necessary to meet public health or safety needs; or (iii) government action is necessary to meet requirements for public use under federal regulations (also referred to as “march-in rights”). The U.S. government also has the right to take title to these inventions if we, or the applicable licensor, fail to disclose the invention to the government and fail to file an application to register the intellectual property within specified time limits. Intellectual property generated under a government funded program is also subject to certain reporting requirements, compliance with which may require us or the applicable licensor to expend substantial resources. In addition, the U.S. government requires that any products embodying the subject invention or produced through the use of the subject invention be manufactured substantially in the United States. The manufacturing preference requirement can be waived if the owner of the intellectual property can show that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible. This preference for U.S. manufacturers may limit our ability to contract with non-U.S. product manufacturers for products covered by such intellectual property. To the extent any of our current or future intellectual property is generated through the use of U.S. government funding, the provisions of the Bayh-Dole Act may similarly apply.

We may become involved in lawsuits to protect or enforce our patents or other intellectual property, which could be expensive, time-consuming and unsuccessful.

Competitors may infringe our patents, trademarks, copyrights or other intellectual property. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time-consuming and divert the time and attention of our management and scientific personnel. Any claims we

assert against perceived infringers could provoke these parties to assert counterclaims against us alleging that we infringe their patents, in addition to counterclaims asserting that our patents are invalid or unenforceable, or both. In any patent infringement proceeding, there is a risk that a court will decide that a patent of ours is invalid or unenforceable, in whole or in part, and that we do not have the right to stop the other party from using the invention at issue. There is also a risk that, even if the validity of such patents is upheld, the court will construe the patent's claims narrowly or decide that we do not have the right to stop the other party from using the invention at issue on the grounds that our patent claims do not cover the invention. An adverse outcome in a litigation or proceeding involving our patents could limit our ability to assert our patents against those parties or other competitors, and may curtail or preclude our ability to exclude third parties from making and selling similar or competitive products. Any of these occurrences could adversely affect our competitive business position, business prospects and financial condition. Similarly, if we assert trademark infringement claims, a court may determine that the marks we have asserted are invalid or unenforceable, or that the party against whom we have asserted trademark infringement has superior rights to the marks in question. In this case, we could ultimately be forced to cease use of such trademarks.

Even if we establish infringement, the court may decide not to grant an injunction against further infringing activity and instead award only monetary damages, which may or may not be an adequate remedy. Furthermore, because of the substantial amount of discovery required in connection with intellectual property litigation, there is a risk that some of our confidential information could be compromised by disclosure during litigation. There could also be public announcements of the results of hearings, motions or other interim proceedings or developments. If securities analysts or investors perceive these results to be negative, it could have a material adverse effect on the price of shares of our common stock. Moreover, there can be no assurance that we will have sufficient financial or other resources to file and pursue such infringement claims, which typically last for years before they are concluded. Even if we ultimately prevail in such claims, the monetary cost of such litigation and the diversion of the attention of our management and scientific personnel could outweigh any benefit we receive as a result of the proceedings. Any of the foregoing may have a material adverse effect on our business, financial condition, results of operations and prospects.

Changes to the patent law in the United States and other jurisdictions could diminish the value of patents in general, thereby impairing our ability to protect our product candidates.

As is the case with other biopharmaceutical companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biopharmaceutical industry involve both technological and legal complexity, and is therefore costly, time-consuming and inherently uncertain. In addition, the United States has recently enacted and is currently implementing wide-ranging patent reform legislation. Recent U.S. Supreme Court rulings have narrowed the scope of patent protection available in certain circumstances and weakened the rights of patent owners in certain situations. In addition to increasing uncertainty with regard to our ability to obtain patents in the future, this combination of events has created uncertainty with respect to the value of patents, once obtained. Depending on decisions by the U.S. Congress, the federal courts, and the USPTO, the laws and regulations governing patents could change in unpredictable ways that would weaken our ability to obtain new patents or to enforce our existing patents and patents that we might obtain in the future. For example, in the case, *Assoc. for Molecular Pathology v. Myriad Genetics, Inc.*, the U.S. Supreme Court held that certain claims to DNA molecules are not patentable. While we do not believe that any of the patents owned or licensed by us will be found invalid based on this decision, we cannot predict how future decisions by the courts, the U.S. Congress or the USPTO may impact the value of our patents.

We may not be able to protect our intellectual property rights throughout the world.

Filing, prosecuting, maintaining, defending and enforcing patents on our product candidates in all countries throughout the world would be prohibitively expensive, and our intellectual property rights in some countries outside the United States can be less extensive than those in the United States. In addition, the laws of some foreign countries do not protect intellectual property rights to the same extent as federal and state laws in the

United States. Consequently, we may not be able to prevent third parties from practicing our inventions in all countries outside the United States, or from selling or importing products made using our inventions in and into the United States or other jurisdictions. Competitors may use our technologies in jurisdictions where we have not obtained patent protection to develop their own drugs and may export otherwise infringing drugs to territories where we have patent protection, but enforcement rights are not as strong as those in the United States. These drugs may compete with our product candidates and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

Many companies have encountered significant problems in protecting and defending intellectual property rights in foreign jurisdictions. The legal systems of some countries do not favor the enforcement of patents and other intellectual property protection, which could make it difficult for us to stop the infringement of our patents generally. Proceedings to enforce our patent rights in foreign jurisdictions could result in substantial costs and divert our efforts and attention from other aspects of our business, could put our patents at risk of being invalidated or interpreted narrowly and our patent applications at risk of not issuing and could provoke third parties to assert claims against us. We may not prevail in any lawsuits that we initiate, and the damages or other remedies awarded, if any, may not be commercially meaningful.

Many countries have compulsory licensing laws under which a patent owner may be compelled under specified circumstances to grant licenses to third parties. In addition, many countries limit the enforceability of patents against government agencies or government contractors. In those countries, we may have limited remedies if patents are infringed or if we are compelled to grant a license to a third party, which could materially diminish the value of those patents. This could limit our potential revenue opportunities. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license, which could adversely affect our business, financial condition, results of operations, and prospects.

Patent terms may be inadequate to protect our competitive position on our product candidates for an adequate amount of time.

Patents have a limited lifespan. In the U.S., if all maintenance fees are timely paid, the natural expiration of a patent is generally 20 years from its earliest U.S. non-provisional filing date. Various extensions may be available, but the life of a patent, and the protection it affords, is limited. Even if patents covering our product candidates are obtained, once the patent life has expired for a product candidate, we may be open to competition from competitive medications, including generic medications. Given the amount of time required for the development, testing and regulatory review of new product candidates, patents protecting such product candidates might expire before or shortly after such product candidates are commercialized. As a result, our owned and licensed patent portfolio may not provide us with sufficient rights to exclude others from commercializing product candidates similar or identical to ours.

Depending upon the timing, duration and conditions of any FDA marketing approval of our product candidates, one or more of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, referred to as the Hatch-Waxman Amendments, and similar legislation in the European Union. The Hatch-Waxman Amendments permit a patent term extension of up to five years for a patent covering an approved product as compensation for effective patent term lost during product development and the FDA regulatory review process. However, we may not receive an extension if we fail to exercise due diligence during the testing phase or regulatory review process, fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Moreover, the length of the extension could be less than we request. Only one patent per approved product can be extended, the extension cannot extend the total patent term beyond 14 years from approval and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. If we are unable to obtain patent term extension or the term of any such extension is less than we request, the period during which we can enforce our patent rights for the applicable product candidate will be shortened and our

competitors may obtain approval to market competing products sooner. As a result, our revenue from applicable products could be reduced. Further, if this occurs, our competitors may take advantage of our investment in development and trials by referencing our clinical and preclinical data and launch their product earlier than might otherwise be the case, and our competitive position, business, financial condition, results of operations, and prospects could be materially harmed.

Third parties may assert that our employees or consultants have wrongfully used or disclosed confidential information or misappropriated trade secrets.

We employ individuals who were previously employed at universities or other biopharmaceutical companies, including our competitors or potential competitors. Although we try to ensure that our employees and consultants do not use the proprietary information or know-how of others in their work for us, we may be subject to claims that we or our employees, consultants or independent contractors have inadvertently or otherwise used or disclosed intellectual property, including trade secrets or other proprietary information, of a former employer or other third parties. Litigation may be necessary to defend against these claims. If we fail in defending any such claims, in addition to paying monetary damages, we may lose valuable intellectual property rights or personnel. Even if we are successful in defending against such claims, litigation could result in substantial costs and be a distraction to management and other employees.

Intellectual property rights do not necessarily address all potential threats.

The degree of future protection afforded by our intellectual property rights is uncertain because intellectual property rights have limitations and may not adequately protect our business or permit us to maintain our competitive advantage. For example:

- others may be able to make products that are similar to any product candidates we may develop or utilize similar technology but that are not covered by the claims of the patents that we license or may own in the future;
- we, or our current or future licensors might not have been the first to make the inventions covered by the issued patent or pending patent application that we license or may own in the future;
- we, or our current or future licensors might not have been the first to file patent applications covering certain of our or their inventions;
- others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our owned or licensed intellectual property rights;
- it is possible that our pending owned or licensed patent applications or those that we may own or license in the future will not lead to issued patents;
- issued patents that we hold rights to may be held invalid or unenforceable, including as a result of legal challenges by our competitors;
- our competitors might conduct research and development activities in countries where we do not have patent rights and then use the information learned from such activities to develop competitive products for sale in our major commercial markets;
- we may not develop additional proprietary technologies that are patentable;
- the patents of others may harm our business; and
- we may choose not to file a patent in order to maintain certain trade secrets or know-how, and a third party may subsequently file a patent covering such intellectual property.

Should any of these events occur, they could harm our business, financial condition, results of operations, and prospects.

Risks Related to Our Dependence on Third Parties

We expect to depend on collaborations with third parties for the research, development, and commercialization of certain of the product candidates we may develop. If any such collaborations are not successful, we may not be able to capitalize on the market potential of those product candidates.

We anticipate seeking third-party collaborators for the research, development, and commercialization of certain of the product candidates we may develop. Our likely collaborators for any other collaboration arrangements include large and mid-size pharmaceutical companies, regional and national pharmaceutical companies, and biotechnology companies. If we enter into any such arrangements with any third parties, we will likely have limited control over the amount and timing of resources that our collaborators dedicate to the development or commercialization of any product candidates we may seek to develop with them. Our ability to generate revenues from these arrangements will depend on our collaborators' abilities to successfully perform the functions assigned to them in these arrangements. We cannot predict the success of any collaboration that we enter into.

Collaborations involving our research programs or any product candidates we may develop, pose the following risks to us:

- Collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations.
- Collaborators may not pursue development and commercialization of any product candidates we may develop or may elect not to continue or renew development or commercialization programs based on clinical trial results, changes in the collaborator's strategic focus or available funding or external factors such as an acquisition that diverts resources or creates competing priorities.
- Collaborators may delay clinical trials, provide insufficient funding for a clinical trial program, stop a clinical trial or abandon a product candidate, repeat or conduct new clinical trials, or require a new formulation of a product candidate for clinical testing.
- Collaborators could independently develop, or develop with third parties, products that compete directly or indirectly with our medicines or product candidates if the collaborators believe that competitive products are more likely to be successfully developed or can be commercialized under terms that are more economically attractive than ours.
- Collaborators with marketing and distribution rights to one or more medicines may not commit sufficient resources to the marketing and distribution of such medicine or medicines.
- Collaborators may not properly obtain, maintain, enforce, or defend our intellectual property or proprietary rights or may use our proprietary information in such a way as to invite litigation that could jeopardize or invalidate our proprietary information or expose us to potential litigation.
- Disputes may arise between the collaborators and us that result in the delay or termination of the research, development, or commercialization of our medicines or product candidates or that result in costly litigation or arbitration that diverts management attention and resources.
- We may lose certain valuable rights under circumstances identified in our collaborations, including if we undergo a change of control.
- Collaborations may be terminated and, if terminated, may result in a need for additional capital to pursue further development or commercialization of the applicable product candidates.
- Collaboration agreements may not lead to development or commercialization of product candidates in the most efficient manner or at all. If a present or future collaborator of ours were to be involved in a business combination, the continued pursuit and emphasis on our product development or commercialization program under such collaboration could be delayed, diminished, or terminated.

If our collaborations do not result in the successful development and commercialization of products, or if one of our collaborators terminates its agreement with us, we may not receive any future research funding or milestone

[Table of Contents](#)

or royalty payments under the collaboration. If we do not receive the funding we expect under these agreements, our development of product candidates could be delayed, and we may need additional resources to develop product candidates. In addition, if one of our collaborators terminates its agreement with us, we may find it more difficult to find a suitable replacement collaborator or attract new collaborators, and our development programs may be delayed or the perception of us in the business and financial communities could be adversely affected. All of the risks relating to product development, regulatory approval, and commercialization described in this prospectus apply to the activities of our collaborators.

We have in the past and may in the future decide to collaborate with pharmaceutical and biotechnology companies for the development and potential commercialization of any product candidates we may develop. These relationships, or those like them, may require us to incur non-recurring and other charges, increase our near- and long-term expenditures, issue securities that dilute our existing stockholders, or disrupt our management and business. In addition, we could face significant competition in seeking appropriate collaborators, and the negotiation process is time-consuming and complex. Our ability to reach a definitive collaboration agreement will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration, and the proposed collaborator's evaluation of several factors. If we license rights to any product candidates we or our collaborators may develop, we may not be able to realize the benefit of such transactions if we are unable to successfully integrate them with our existing operations and company culture.

We are developing E478 specifically to partner with gene therapy and genome editing companies. If we are unable to find willing collaborators, this may adversely affect the development of E478 and our business.

We are developing E478 specifically to partner and collaborate with gene therapy and genome editing companies. In particular, we seek to selectively pursue collaboration arrangements with companies that have particular technology, expertise or resources for the development of E478, if approved. However, we may not be able to execute on such collaboration and any collaboration that we may enter into may not be successful. If we are unable to identify partners whose capabilities complement and integrate well with ours and reach collaboration arrangements with such partners on a timely basis, on acceptable terms or at all, or if the arrangements we establish are unproductive for us, we may fail to meet our business and development objectives for E478, which may adversely affect our business.

If we are not able to establish collaborations on commercially reasonable terms, we may have to alter our development and commercialization plans.

Our product development and research programs and the potential commercialization of any product candidates we may develop will require substantial additional cash to fund expenses. For some of the product candidates we may develop, we may decide to collaborate with other pharmaceutical and biotechnology companies for the development and potential commercialization of those product candidates. For example, in connection with our license agreement with Novartis, we issued to Novartis, 2,500,000 shares of Series A redeemable convertible preferred stock and 643,550 shares of Series B redeemable convertible preferred stock, causing our stockholders to experience dilution. If in the future, we enter into collaborations with other third parties, we may issue additional equity as part of such collaboration.

We face significant competition in seeking appropriate collaborators. Whether we reach a definitive agreement for a collaboration will depend, among other things, upon our assessment of the collaborator's resources and expertise, the terms and conditions of the proposed collaboration, and the proposed collaborator's evaluation of a number of factors. Those factors may include the design or results of clinical trials, the likelihood of approval by the FDA or similar regulatory authorities outside the United States, the potential market for the subject product candidate, the costs and complexities of manufacturing and delivering such product candidate to patients, the potential of competing products, the existence of uncertainty with respect to our ownership of technology, which can exist if there is a challenge to such ownership without regard to the merits of the challenge, and industry and

market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us.

Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

If any party to which we have outsourced certain functions fails to perform its obligations under agreements with us, the development and commercialization of our product candidates and any future product candidates could be delayed or terminated.

To the extent that we rely on third party individuals or other companies to manage the day-to-day conduct of our clinical trials or to manufacture, sell or market our current product candidates or any future product candidates, we will be dependent on the timeliness and effectiveness of their efforts. If a clinical research management organization that we might utilize is unable to allocate sufficient qualified personnel to our studies or if the work performed by it does not fully satisfy the rigorous requirements of the FDA, we may encounter substantial delays and increased costs in completing our clinical trials. If a firm producing humanized forms of our molecular antibody product candidates or a manufacturer of the raw material or finished product for our clinical trials is unable to meet our time schedules or cost parameters, the timing of our clinical trials and development of our product candidates may be adversely affected. Any manufacturer that we select may encounter difficulties in scaling-up the manufacture of new products in commercial quantities, including problems involving product yields, product stability or shelf life, quality control, adequacy of control procedures and policies, compliance with FDA regulations and the need for further FDA approval of any new manufacturing processes and facilities. The manufacture of clinical supplies for studies and commercial quantities of our current product candidates and any future product candidates are likely to be inherently more difficult and costly than typical chemical pharmaceuticals. This could delay commercialization of any of our product candidates, if approved, or reduce the profitability of these candidates for us. If any of these occur, the development and commercialization of our product candidates could be delayed, curtailed or terminated because we may not have sufficient financial resources or capabilities to continue such development and commercialization on our own.

We expect to continue to rely on third parties to manufacture our clinical product supplies, and we intend to rely on third parties to produce and process our product candidates, if approved.

We do not currently own any facility that may be used as our clinical-scale manufacturing and processing facility and must eventually rely on outside vendors to manufacture supplies and process our product candidates. We have not yet caused any product candidates to be manufactured or processed on a commercial scale and may not be able to do so for any of our product candidates. We will make changes as we work to optimize the manufacturing process, and we cannot be sure that even minor changes in the process will result in therapies that are safe and effective.

The facilities used by our contract manufacturers to manufacture our product candidates must be approved by the FDA or other foreign regulatory agencies pursuant to inspections that will be conducted after we submit an application to the FDA or other foreign regulatory agencies. We do not control the manufacturing process of, and will be completely dependent on, our contract manufacturing partners for compliance with regulatory requirements, known as cGMP requirements for manufacture of our product candidates. If our contract manufacturers cannot successfully manufacture material that conforms to our specifications and the strict regulatory requirements of the FDA or other regulatory authorities, they will not be able to secure and/or maintain regulatory approval for their manufacturing facilities. In addition, we have no control over the ability of our contract manufacturers to maintain adequate quality control, quality assurance and qualified personnel. If the FDA or a comparable foreign regulatory authority does not approve these facilities for the manufacture of our product candidates or if it withdraws any such approval in the future, we may need to find alternative

manufacturing facilities, which would significantly impact our ability to develop, obtain regulatory approval for or market our product candidates, if approved.

In addition, should any of our agreements with our contract manufacturers terminate, in particular the agreements with the University of Minnesota and Heidelberg Pharma, they may be difficult to replace if we were no longer able to rely on them.

Risks Related to Employee Matters, Managing Growth and Other Risks Related to Our Business

We will need to grow the size of our organization, and we may experience difficulties in managing this growth.

As of April 30, 2018, we had 48 full-time employees. As our development, manufacturing and commercialization plans and strategies develop, and as we transition into operating as a public company, we expect to need and are actively recruiting additional managerial, operational, sales, marketing, financial and other personnel. Future growth would impose significant added responsibilities on members of management, including:

- identifying, recruiting, integrating, maintaining and motivating additional employees;
- managing our internal development efforts effectively, including the clinical, FDA and international regulatory review process for our product candidates, while complying with our contractual obligations to contractors and other third parties; and
- improving our operational, financial and management controls, reporting systems and procedures.

Our future financial performance and our ability to develop, manufacture and commercialize our product candidates will depend, in part, on our ability to effectively manage any future growth, and our management may also have to divert financial and other resources, and a disproportionate amount of its attention away from day-to-day activities in order to devote a substantial amount of time, to managing these growth activities.

We currently rely, and for the foreseeable future will continue to rely, in substantial part on certain independent organizations, advisors and consultants to provide certain services, including substantially all aspects of regulatory approval, clinical management and manufacturing. We cannot assure you that the services of independent organizations, advisors and consultants will continue to be available to us on a timely basis when needed, or that we can find qualified replacements. In addition, if we are unable to effectively manage our outsourced activities or if the quality or accuracy of the services provided by consultants is compromised for any reason, our clinical trials may be extended, delayed or terminated, and we may not be able to obtain regulatory approval of our product candidates or otherwise advance our business. We cannot assure you that we will be able to manage our existing consultants or find other competent outside contractors and consultants on economically reasonable terms, or at all.

If we are not able to effectively expand our organization by hiring new employees and expanding our groups of consultants and contractors, we may not be able to successfully implement the tasks necessary to further develop and commercialize our product candidates and, accordingly, may not achieve our research, development and commercialization goals.

We expect to expand our development, regulatory, and future sales and marketing capabilities, and as a result, we may encounter difficulties in managing our growth, which could disrupt our operations.

We expect to experience significant growth in the number of our employees and the scope of our operations, particularly in the areas of drug development, regulatory affairs, and sales and marketing. To manage our anticipated future growth, we must continue to implement and improve our managerial, operational, and financial systems, expand our facilities, and continue to recruit and train additional qualified personnel. Due to our limited financial resources and the limited experience of our management team in managing a company with such

Table of Contents

anticipated growth, we may not be able to effectively manage the expected expansion of our operations or recruit and train additional qualified personnel. Moreover, the expected physical expansion of our operations may lead to significant costs and may divert our management and business development resources. Any inability to manage growth could delay the execution of our business plans or disrupt our operations.

If we lose key management personnel, or if we fail to recruit additional highly skilled personnel, our ability to identify and develop new or next generation product candidates will be impaired, could result in loss of markets or market share and could make us less competitive.

Our ability to compete in the highly competitive biotechnology and pharmaceutical industries depends upon our ability to attract and retain highly qualified managerial, scientific and medical personnel. We are highly dependent on our management, particularly our Chief Executive Officer, the members of our executive team listed under “Management” located elsewhere in this prospectus, and key scientific and medical personnel employees. The loss of the services of any of our executive officers, key employees, and scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business. The loss of the services of any of our executive officers, key employees, and scientific and medical advisors, and our inability to find suitable replacements, could result in delays in product development and harm our business.

We conduct our operations at our facility in Cambridge, Massachusetts. This region is headquarters to many other biopharmaceutical companies and many academic and research institutions. Competition for skilled personnel in our market is intense and may limit our ability to hire and retain highly qualified personnel on acceptable terms or at all.

To induce valuable employees to remain at our company, in addition to salary and cash incentives, we have provided stock options that vest over time. The value to employees of stock options that vest over time may be significantly affected by movements in our stock price that are beyond our control, and may at any time be insufficient to counteract more lucrative offers from other companies. Despite our efforts to retain valuable employees, members of our management, scientific and development teams may terminate their employment with us on short notice. Although we have employment offer letters with our key employees, these agreements provide for at-will employment, which means that any of our employees could leave our employment at any time, with or without notice. We do not maintain “key man” insurance policies on the lives of these individuals or the lives of any of our other employees. Our success also depends on our ability to continue to attract, retain and motivate highly skilled junior, mid-level and senior managers as well as junior, mid-level and senior scientific and medical personnel.

If we fail to maintain an effective system of internal control over financial reporting, we may not be able to accurately report our financial results or prevent fraud. As a result, stockholders could lose confidence in our financial and other public reporting, which would harm our business and the trading price of our common stock.

Effective internal controls over financial reporting are necessary for us to provide reliable financial reports and, together with adequate disclosure controls and procedures, are designed to prevent fraud. Any failure to implement required new or improved controls, or difficulties encountered in their implementation could cause us to fail to meet our reporting obligations. In addition, any testing by us conducted in connection with Section 404 of the Sarbanes-Oxley Act of 2002, or any subsequent testing by our independent registered public accounting firm, may reveal deficiencies in our internal controls over financial reporting that are deemed to be material weaknesses or that may require prospective or retroactive changes to our financial statements or identify other areas for further attention or improvement. Inferior internal controls could also cause investors to lose confidence in our reported financial information, which could have a negative effect on the trading price of our stock.

We will be required to disclose changes made in our internal controls and procedures on a quarterly basis and our management will be required to assess the effectiveness of these controls annually. However, for as long as we

are an “emerging growth company” under the JOBS Act, our independent registered public accounting firm will not be required to attest to the effectiveness of our internal controls over financial reporting pursuant to Section 404. We could be an “emerging growth company” for up to five years. An independent assessment of the effectiveness of our internal controls over financial reporting could detect problems that our management’s assessment might not. Undetected material weaknesses in our internal controls over financial reporting could lead to financial statement restatements and require us to incur the expense of remediation.

Unstable market and economic conditions may have serious adverse consequences on our business, financial condition and stock price.

As widely reported, global credit and financial markets have experienced extreme volatility and disruptions in the past several years, including severely diminished liquidity and credit availability, declines in consumer confidence, declines in economic growth, increases in unemployment rates and uncertainty about economic stability. There can be no assurance that further deterioration in credit and financial markets and confidence in economic conditions will not occur. Our general business strategy may be adversely affected by any such economic downturn, volatile business environment or continued unpredictable and unstable market conditions. If the current equity and credit markets deteriorate, or do not improve, it may make any necessary debt or equity financing more difficult, more costly, and more dilutive. Failure to secure any necessary financing in a timely manner and on favorable terms could have a material adverse effect on our growth strategy, financial performance and stock price and could require us to delay or abandon clinical development plans. In addition, there is a risk that one or more of our current service providers, manufacturers and other partners may not survive these difficult economic times, which could directly affect our ability to attain our operating goals on schedule and on budget.

At March 31, 2018, we had approximately \$41.5 million of cash and cash equivalents. While we are not aware of any downgrades, material losses, or other significant deterioration in the fair value of our cash equivalents since March 31, 2018, no assurance can be given that further deterioration of the global credit and financial markets would not negatively impact our current portfolio of cash equivalents or our ability to meet our financing objectives. Furthermore, our stock price may decline due in part to the volatility of the stock market and the general economic downturn.

Business disruptions could seriously harm our future revenue and financial condition and increase our costs and expenses.

Our operations, and those of our CMOs, our CROs and other contractors and consultants, could be subject to earthquakes, power shortages, telecommunications failures, water shortages, floods, hurricanes, typhoons, fires, extreme weather conditions, medical epidemics and other natural or man-made disasters or business interruptions, for which we are predominantly self-insured. The occurrence of any of these business disruptions could seriously harm our operations and financial condition and increase our costs and expenses. Our ability to obtain clinical supplies of our product candidates could be disrupted if the operations of these suppliers are affected by a man-made or natural disaster or other business interruption.

Our internal computer systems, or those used by our CMOs, CROs or other contractors or consultants, may fail or suffer security breaches.

Despite the implementation of security measures, our internal computer systems and those of our future CMOs, future CROs and other contractors and consultants are vulnerable to damage from computer viruses and unauthorized access. While we have not experienced any such material system failure or security breach to date, if such an event were to occur and cause interruptions in our operations, it could result in a material disruption of our development programs and our business operations. For example, the loss of clinical trial data from completed or future clinical trials could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. Likewise, we may rely on third parties for the manufacture of

our product candidates and to conduct clinical trials, and similar events relating to their computer systems could also have a material adverse effect on our business. To the extent that any disruption or security breach were to result in a loss of, or damage to, our data or applications, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the further development and commercialization of our product candidates could be delayed.

Our employees, independent contractors, consultants, commercial partners and vendors may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements.

We are exposed to the risk of employee fraud or other illegal activity by our employees, independent contractors, consultants, commercial partners and vendors. Misconduct by these parties could include intentional, reckless and/or negligent conduct that fails to comply with the laws of the FDA and other similar foreign regulatory bodies, provide true, complete and accurate information to the FDA and other similar foreign regulatory bodies, comply with manufacturing standards we have established, comply with healthcare fraud and abuse laws in the United States and similar foreign fraudulent misconduct laws, or report financial information or data accurately or to disclose unauthorized activities to us. If we obtain FDA approval of any of our product candidates and begin commercializing those products in the United States, our potential exposure under such laws will increase significantly, and our costs associated with compliance with such laws are also likely to increase. These laws may impact, among other things, our current activities with principal investigators and research patients, as well as proposed and future sales, marketing and education programs.

Our relationships with healthcare providers and physicians and third-party payors will be subject to applicable anti-kickback, fraud and abuse and other healthcare laws and regulations, which could expose us to criminal sanctions, civil penalties, contractual damages, reputational harm and diminished profits and future earnings.

Healthcare providers, physicians and third-party payors in the United States and elsewhere play a primary role in the recommendation and prescription of pharmaceutical products. Arrangements with third-party payors and customers can expose pharmaceutical manufacturers to broadly applicable fraud and abuse and other healthcare laws and regulations, including, without limitation, the federal Anti-Kickback Statute and the federal False Claims Act, which may constrain the business or financial arrangements and relationships through which such companies sell, market and distribute pharmaceutical products. In particular, the promotion, sales and marketing of healthcare items and services, as well as certain business arrangements in the healthcare industry, are subject to extensive laws designed to prevent fraud, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, structuring and commission(s), certain customer incentive programs and other business arrangements generally. Activities subject to these laws also involve the improper use of information obtained in the course of patient recruitment for clinical trials. The applicable federal, state and foreign healthcare laws and regulations laws that may affect our ability to operate include, but are not limited to:

- the federal Anti-Kickback Statute, which prohibits, among other things, knowingly and willfully soliciting, receiving, offering or paying any remuneration (including any kickback, bribe, or rebate), directly or indirectly, overtly or covertly, in cash or in kind, to induce, or in return for, either the referral of an individual, or the purchase, lease, order or recommendation of any good, facility, item or service for which payment may be made, in whole or in part, under a federal healthcare program, such as the Medicare and Medicaid programs. A person or entity can be found guilty of violating the statute without actual knowledge of the statute or specific intent to violate it. In addition, a claim including items or services resulting from a violation of the federal Anti-Kickback Statute constitutes a false or fraudulent claim for purposes of the False Claims Act. The Anti-Kickback Statute has been interpreted to apply to arrangements between pharmaceutical manufacturers on the one hand and prescribers, purchasers, and formulary managers on the other. There are a number of statutory exceptions and regulatory safe harbors protecting some common activities from prosecution;

[Table of Contents](#)

- federal civil and criminal false claims laws and civil monetary penalty laws, including the False Claims Act, or FCA, which prohibit, among other things, individuals or entities from knowingly presenting, or causing to be presented, false or fraudulent claims for payment to, or approval by Medicare, Medicaid, or other federal healthcare programs, knowingly making, using or causing to be made or used a false record or statement material to a false or fraudulent claim or an obligation to pay or transmit money to the federal government, or knowingly concealing or knowingly and improperly avoiding or decreasing an obligation to pay money to the federal government. Manufacturers can be held liable under the FCA even when they do not submit claims directly to government payors if they are deemed to “cause” the submission of false or fraudulent claims. The FCA also permits a private individual acting as a “whistleblower” to bring actions on behalf of the federal government alleging violations of the FCA and to share in any monetary recovery;
- the federal Health Insurance Portability and Accountability Act of 1996, or HIPAA, which created new federal criminal statutes that prohibit knowingly and willfully executing, or attempting to execute, a scheme to defraud any healthcare benefit program or obtain, by means of false or fraudulent pretenses, representations, or promises, any of the money or property owned by, or under the custody or control of, any healthcare benefit program, regardless of the payor (e.g., public or private) and knowingly and willfully falsifying, concealing or covering up by any trick or device a material fact or making any materially false statements in connection with the delivery of, or payment for, healthcare benefits, items or services relating to healthcare matters. Similar to the federal Anti-Kickback Statute, a person or entity can be found guilty of violating HIPAA without actual knowledge of the statute or specific intent to violate it;
- HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose, among other things, requirements on certain covered healthcare providers, health plans, and healthcare clearinghouses as well as their respective business associates that perform services for them that involve the use, or disclosure of, individually identifiable health information, relating to the privacy, security and transmission of individually identifiable health information without appropriate authorization. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys’ fees and costs associated with pursuing federal civil actions;
- the federal Physician Payment Sunshine Act, created under the Health Reform Law, and its implementing regulations, which require manufacturers of drugs, devices, biologicals and medical supplies for which payment is available under Medicare, Medicaid or the Children’s Health Insurance Program (with certain exceptions) to report annually to the United States Department of Health and Human Services, or HHS, information related to payments or other transfers of value made to physicians (defined to include doctors, dentists, optometrists, podiatrists and chiropractors) and teaching hospitals, as well as ownership and investment interests held by physicians and their immediate family members; and
- federal consumer protection and unfair competition laws, which broadly regulate marketplace activities and activities that potentially harm consumers.

Additionally, we are subject to state and foreign equivalents of each of the healthcare laws described above, among others, some of which may be broader in scope and may apply regardless of the payor.

Pricing and rebate programs must comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990 and more recent requirements in the Affordable Care Act. If products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Products must meet applicable child-resistant packaging requirements under the U.S. Poison Prevention Packaging Act. Manufacturing, sales, promotion and other activities also are potentially subject to federal and state consumer protection and unfair competition laws.

The distribution of pharmaceutical products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage and security requirements intended to prevent the unauthorized sale of pharmaceutical products.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies often scrutinize interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time- and resource-consuming and can divert a company's attention from the business.

The failure to comply with any of these laws or regulatory requirements subjects entities to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in civil, criminal and administrative penalties, damages, fines, disgorgement, individual imprisonment, possible exclusion from participation in federal and state funded healthcare programs, contractual damages and the curtailment or restricting of our operations, as well as additional reporting obligations and oversight if we become subject to a corporate integrity agreement or other agreement to resolve allegations of non-compliance with these laws. Any action for violation of these laws, even if successfully defended, could cause a pharmaceutical manufacturer to incur significant legal expenses and divert management's attention from the operation of the business. Prohibitions or restrictions on sales or withdrawal of future marketed products could materially affect business in an adverse way. Effective upon the completion of this offering, we will adopt a code of business conduct and ethics, but it is not always possible to identify and deter employee misconduct, and the precautions we take to detect and prevent inappropriate conduct may not be effective in controlling unknown or unmanaged risks or losses or in protecting us from governmental investigations or other actions or lawsuits stemming from a failure to be in compliance with such laws or regulations. Efforts to ensure that our business arrangements will comply with applicable healthcare laws may involve substantial costs. It is possible that governmental and enforcement authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law interpreting applicable fraud and abuse or other healthcare laws and regulations. If any such actions are instituted against us, and we are not successful in defending ourselves or asserting our rights, those actions could have a significant impact on our business, including the imposition of civil, criminal and administrative penalties, damages, disgorgement, monetary fines, possible exclusion from participation in Medicare, Medicaid and other federal healthcare programs, contractual damages, reputational harm, diminished profits and future earnings, and curtailment of our operations, any of which could adversely affect our ability to operate our business and our results of operations. In addition, the approval and commercialization of any of our product candidates outside the United States will also likely subject us to foreign equivalents of the healthcare laws mentioned above, among other foreign laws.

Our ability to utilize our net operating loss carryforwards and certain other tax attributes may be limited.

Under Sections 382 and 383 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change" (generally defined as a greater than 50% change (by value) in its equity ownership over a three-year period), the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes to offset its post-change income may be limited. As a result of our most recent private placements and other transactions that have occurred over the past three years, we may have experienced, and, upon completion of this offering, may experience, an "ownership change." We may also experience ownership changes in the future as a result of subsequent shifts in our stock ownership. As of December 31, 2017, we had U.S. net operating loss carryforwards of approximately \$18.7 million and U.S. research and development credits of \$1.0 million, which could be limited if we experience an "ownership change."

We may not be successful in finding strategic collaborators for continuing development of certain of our product candidates or successfully commercializing or competing in the market for certain indications.

Because we have limited financial and managerial resources, we focus on research programs and product candidates that we identify for specific indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential. Our resource allocation decisions may cause us to fail to timely capitalize on viable commercial products or profitable market opportunities. Our spending on current and future research and development programs and product candidates for specific indications may not yield any commercially viable products. If we do not accurately evaluate the commercial potential or target market for a particular product candidate, we may relinquish valuable rights to that product candidate through collaboration, licensing or other royalty arrangements in cases in which it would have been more advantageous for us to retain sole development and commercialization rights to such product candidate. and industry and market conditions generally. The collaborator may also consider alternative product candidates or technologies for similar indications that may be available to collaborate on and whether such a collaboration could be more attractive than the one with us for our product candidate. The terms of any additional collaborations or other arrangements that we may establish may not be favorable to us.

We may also be restricted under existing collaboration agreements from entering into future agreements on certain terms with potential collaborators. Collaborations are complex and time-consuming to negotiate and document. In addition, there have been a significant number of recent business combinations among large pharmaceutical companies that have resulted in a reduced number of potential future collaborators.

We may not be able to negotiate collaborations on a timely basis, on acceptable terms, or at all. If we are unable to do so, we may have to curtail the development of the product candidate for which we are seeking to collaborate, reduce or delay its development program or one or more of our other development programs, delay its potential commercialization or reduce the scope of any sales or marketing activities, or increase our expenditures and undertake development or commercialization activities at our own expense. If we elect to increase our expenditures to fund development or commercialization activities on our own, we may need to obtain additional capital, which may not be available to us on acceptable terms or at all. If we do not have sufficient funds, we may not be able to further develop our product candidates or bring them to market and generate product revenue.

In addition, any collaborations that we enter into may not be successful. The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators. Collaborators generally have significant discretion in determining the efforts and resources that they will apply to these collaborations. Disagreements between parties to a collaboration arrangement regarding clinical development and commercialization matters can lead to delays in the development process or commercializing the applicable product candidate and, in some cases, termination of the collaboration arrangement. These disagreements can be difficult to resolve if neither of the parties has final decision-making authority. Collaborations with pharmaceutical or biotechnology companies and other third parties often are terminated or allowed to expire by the other party. Any such termination or expiration would adversely affect us financially and could harm our business reputation.

We face significant competition from other biotechnology and pharmaceutical companies, and our operating results will suffer if we fail to compete effectively.

The biopharmaceutical industry is characterized by intense competition and rapid innovation. Our competitors may be able to develop other compounds or drugs that are able to achieve similar or better results. Our potential competitors include major multinational pharmaceutical companies, established biotechnology companies, specialty pharmaceutical companies and universities and other research institutions. Many of our competitors have substantially greater financial, technical and other resources, such as larger research and development staff and experienced marketing and manufacturing organizations and well-established sales forces. Smaller or early-

[Table of Contents](#)

stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies. Mergers and acquisitions in the biotechnology and pharmaceutical industries may result in even more resources being concentrated in our competitors. Competition may increase further as a result of advances in the commercial applicability of technologies and greater availability of capital for investment in these industries. Our competitors, either alone or with collaborative partners, may succeed in developing, acquiring or licensing on an exclusive basis drug or biologic products that are more effective, safer, more easily commercialized or less costly than our product candidates or may develop proprietary technologies or secure patent protection that we may need for the development of our technologies and products. We believe the key competitive factors that will affect the development and commercial success of our product candidates are efficacy, safety, tolerability, reliability, convenience of use, price and reimbursement.

Our competitors include companies focused on developing technologies to improve the distinct steps of bone marrow transplant.

Competitors in our stem cell expansion programs include: Gamida Cell Ltd., Nohla Therapeutics, Inc., ExCellThera Inc., Angiocrine Bioscience, Inc. and Intellia Therapeutics, Inc. In particular, Intellia Therapeutics, Inc. has exclusively licensed from Novartis the AHR antagonist that we use to manufacture MGTA-456 for expansion of gene-modified HSCs only, and it is likely that the programs developed under this license would compete directly with our E478 program.

We also face competition in our conditioning programs from Actinium Pharmaceuticals, Inc., Stanford University, Forty Seven, Inc. and Molecular Templates, Inc., and in our post-transplant complications program (GvHD) from Bellicum Pharmaceuticals, Inc., Kiadis Pharma NV and Abbvie Inc. Additionally, BioLineRx Ltd. is a competitor in our mobilization program.

In addition, we anticipate competing with the largest pharmaceutical companies in the world, such as Novartis, which is currently conducting research relating to expansion of HSCs that have been modified using CRISPR/Cas9 technology to express therapeutic proteins and delivered to patients for the treatment of potential treatment of blood disorders or primary immune deficiencies, which has greater financial and human resources than we currently have.

Even if we obtain regulatory approval of our product candidates, the availability and price of our competitors' products could limit the demand and the price we are able to charge for our product candidates. We may not be able to implement our business plan if the acceptance of our product candidates is inhibited by price competition or the reluctance of physicians to switch from existing methods of treatment to our product candidates, or if physicians switch to other new drug or biologic products or choose to reserve our product candidates for use in limited circumstances. For additional information regarding our competition, see "Business—Competition."

If we fail to comply with environmental, health and safety laws and regulations, we could become subject to fines or penalties or incur costs that could have a material adverse effect on the success of our business.

We are subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. Our operations involve the use of hazardous and flammable materials, including chemicals and biological materials. Our operations also produce hazardous waste products. We generally contract with third parties for the disposal of these materials and wastes. We cannot eliminate the risk of contamination or injury from these materials, which could cause an interruption of our commercialization efforts, research and development efforts and business operations, environmental damage resulting in costly clean-up and liabilities under applicable laws and regulations governing the use, storage, handling and disposal of these materials and specified waste products. Although we believe that the safety procedures utilized by our third-party manufacturers for handling and disposing of these materials generally comply with the standards prescribed by these laws and regulations, we cannot guarantee that this is the case or eliminate the risk of accidental contamination or injury from these

[Table of Contents](#)

materials. In such an event, we may be held liable for any resulting damages and such liability could exceed our resources and state or federal or other applicable authorities may curtail our use of certain materials and/or interrupt our business operations. Furthermore, environmental laws and regulations are complex, change frequently and have tended to become more stringent. We cannot predict the impact of such changes and cannot be certain of our future compliance. In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. These current or future laws and regulations may impair our research, development or production efforts. Failure to comply with these laws and regulations also may result in substantial fines, penalties or other sanctions. We do not currently carry biological or hazardous waste insurance coverage.

Although we maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees resulting from the use of hazardous materials or other work-related injuries, this insurance may not provide adequate coverage against potential liabilities.

We may not be successful in our efforts to identify additional product candidates. Due to our limited resources and access to capital, we must prioritize development of certain product candidates; these decisions may prove to be wrong and may adversely affect our business.

Although we intend to explore other therapeutic opportunities, in addition to the product candidates that we are currently developing, we may fail to identify successful product candidates for clinical development for a number of reasons. If we fail to identify additional potential product candidates, our business could be materially harmed.

Research programs to pursue the development of our planned product candidates for additional indications and to identify new product candidates and disease targets require substantial technical, financial and human resources whether or not they are ultimately successful. Our research programs may initially show promise in identifying potential indications and/or product candidates, yet fail to yield results for clinical development for a number of reasons, including:

- the research methodology used may not be successful in identifying potential indications and/or product candidates;
- potential product candidates may, after further study, be shown to have harmful adverse effects or other characteristics that indicate they are unlikely to be effective drugs; or
- it may take greater human and financial resources than we will possess to identify additional therapeutic opportunities for our product candidates or to develop suitable potential product candidates through internal research programs, thereby limiting our ability to develop, diversify and expand our product portfolio.

Because we have limited financial and human resources, we intend to initially focus on research programs and product candidates for a limited set of indications. As a result, we may forego or delay pursuit of opportunities with other product candidates or for other indications that later prove to have greater commercial potential or a greater likelihood of success. Our resource allocation decisions may cause us to fail to capitalize on viable commercial products or profitable market opportunities.

Accordingly, there can be no assurance that we will ever be able to identify additional therapeutic opportunities for our product candidates or to develop suitable potential product candidates through internal research programs, which could materially adversely affect our future growth and prospects. We may focus our efforts and resources on potential product candidates or other potential programs that ultimately prove to be unsuccessful.

Risks Related to Our Common Stock and This Offering

An active trading market for our common stock may not develop or be sustainable. If an active trading market does not develop, investors may not be able to resell their shares at or above the initial public offering price and our ability to raise capital in the future may be impaired.

Prior to this offering, there has been no public market for our common stock. The initial public offering price for our common stock will be determined through negotiations with the underwriters. This price may not reflect the price at which investors in the market will be willing to buy and sell our shares following this offering. Although we intend to list our common stock on The NASDAQ Global Market, an active trading market for our shares may never develop or, if developed, be maintained following this offering. If an active market for our common stock does not develop or is not maintained, it may be difficult for you to sell shares you purchase in this offering without depressing the market price for the shares or at all. An inactive trading market may also impair our ability to raise capital to continue to fund operations by selling shares and may impair our ability to acquire other companies or technologies by using our shares as consideration.

If you purchase shares of common stock in this offering, you will suffer immediate dilution in the net tangible book value of your investment.

The initial public offering price of our common stock is substantially higher than the net tangible book value per share of our common stock. Therefore, if you purchase shares of our common stock in this offering, you will pay a price per share that substantially exceeds our net tangible book value per share after this offering. Based on the assumed initial public offering price of \$ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, you will experience immediate dilution of \$ per share, representing the difference between our pro forma net tangible book value per share after giving effect to this offering and the assumed initial public offering price. Purchasers of common stock in this offering will have contributed approximately % of the aggregate price paid by all purchasers of our capital stock and will own approximately % of our common stock outstanding after this offering, excluding any shares of our common stock that they may have acquired prior to this offering. Furthermore, if the underwriters exercise their over-allotment option or our previously issued options and other rights to acquire common stock at prices below the assumed initial public offering price are exercised, you will experience further dilution. For additional information on the dilution that you will experience immediately after this offering, see the section titled “Dilution.”

The trading price of our common stock is likely to be highly volatile, which could result in substantial losses for purchasers of our common stock in this offering. Securities class action or other litigation involving our company or members of our management team could also substantially harm our business, financial condition and results of operations.

Our stock price is likely to be highly volatile. The stock market in general and the market for smaller pharmaceutical and biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, you may not be able to sell your common stock at or above the initial public offering price and you may lose some or all of your investment. The market price for our common stock may be influenced by many factors, including:

- the success of existing or new competitive products or technologies;
- regulatory actions with respect to our product candidates or our competitors’ products and product candidates;
- announcements by us or our competitors of significant acquisitions, strategic partnerships, joint ventures, collaborations or capital commitments;
- the timing and results of preclinical studies for any of our product candidates;
- the timing and results of clinical trials of MGTA-456 and any other product candidates;

[Table of Contents](#)

- commencement or termination of collaborations for E478 or any of our current and future programs and product candidates;
- failure or discontinuation of any of our development programs;
- results of clinical trials of product candidates of our competitors;
- regulatory or legal developments in the United States and other countries;
- developments or disputes concerning patent applications, issued patents or other proprietary rights;
- the recruitment or departure of key personnel;
- the level of expenses related to any of our product candidates or clinical development programs;
- the results of our efforts to develop additional product candidates or products;
- actual or anticipated changes in estimates as to financial results or development timelines;
- announcement or expectation of additional financing efforts;
- sales of our common stock by us, our insiders or other stockholders;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in estimates or recommendations by securities analysts, if any, that cover us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors;
- general economic, industry and market conditions; and
- the other factors described in this “Risk Factors” section.

In the past, securities class action litigation has often been brought against a company following a decline in the market price of its securities. This risk is especially relevant for biopharmaceutical companies, which have experienced significant stock price volatility in recent years.

We have broad discretion in the use of the net proceeds from this offering and may invest or spend the proceeds in ways with which you do not agree and in ways that may not yield a return on your investment.

Although we currently intend to use the net proceeds from this offering in the manner described in the section titled “Use of Proceeds” in this prospectus, our management will have broad discretion in the application of the net proceeds from this offering and could spend the proceeds in ways that do not improve our results of operations or enhance the value of our common stock. You will not have the opportunity to influence our decisions on how to use the net proceeds from this offering. The failure by our management to apply these funds effectively could result in financial losses that could harm our business, cause the price of our common stock to decline and delay the development of our product candidates. Pending their use, we may invest the net proceeds from this offering in a manner that does not produce income or that loses value.

We are an “emerging growth company,” and the reduced disclosure requirements applicable to emerging growth companies may make our common stock less attractive to investors.

We are an emerging growth company, as defined in the Jumpstart Our Business Startups Act, or the JOBS Act, enacted in April 2012. For as long as we continue to be an emerging growth company, we may take advantage of exemptions from various reporting requirements that are applicable to other public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, as amended, or the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements and exemptions from the requirements of holding nonbinding advisory votes on executive compensation and

[Table of Contents](#)

stockholder approval of any golden parachute payments not previously approved. We could be an emerging growth company for up to five years following the year in which we complete this offering, although circumstances could cause us to lose that status earlier. We will remain an emerging growth company until the earlier of (1) the last day of the fiscal year (a) following the fifth anniversary of the completion of this offering, (b) in which we have total annual gross revenue of at least \$1.07 billion or (c) in which we are deemed to be a large accelerated filer, which requires the market value of our common stock that is held by non-affiliates to exceed \$700 million as of the prior June 30th, and (2) the date on which we have issued more than \$1.0 billion in non-convertible debt during the prior three-year period.

Even after we no longer qualify as an emerging growth company, we may still qualify as a “smaller reporting company” which would allow us to take advantage of many of the same exemptions from disclosure requirements including not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act and reduced disclosure obligations regarding executive compensation in this prospectus and our periodic reports and proxy statements. We cannot predict if investors will find our common stock less attractive because we may rely on these exemptions. If some investors find our common stock less attractive as a result, there may be a less active trading market for our common stock and our stock price may be more volatile.

Under the JOBS Act, emerging growth companies can also delay adopting new or revised accounting standards until such time as those standards apply to private companies. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. We have elected not to “opt out” of such extended transition period, which means that when a standard is issued or revised and it has different application dates for public or private companies, we will adopt the new or revised standard at the time private companies adopt the new or revised standard and will do so until such time that we either (1) irrevocably elect to “opt out” of such extended transition period or (2) no longer qualify as an emerging growth company.

We will incur increased costs as a result of operating as a public company, and our management will be required to devote substantial time to new compliance initiatives and corporate governance practices.

As a public company, and particularly after we are no longer an “emerging growth company,” we will incur significant legal, accounting and other expenses that we did not incur as a private company, including costs associated with public company reporting requirements. We also anticipate that we will incur costs associated with relatively recently adopted corporate governance requirements, including requirements of the SEC, and The NASDAQ Global Market. We expect these rules and regulations to increase our legal and financial compliance costs and to make some activities more time-consuming and costly. We also expect that these rules and regulations may make it more difficult and more expensive for us to obtain director and officer liability insurance and we may be required to accept reduced policy limits and coverage or incur substantially higher costs to obtain the same or similar coverage. As a result, it may be more difficult for us to attract and retain qualified individuals to serve on our board of directors or as executive officers.

We are currently evaluating and monitoring developments with respect to these rules, and we cannot predict or estimate the amount of additional costs we may incur or the timing of such costs. These rules and regulations are often subject to varying interpretations, in many cases due to their lack of specificity, and, as a result, their application in practice may evolve over time as new guidance is provided by regulatory and governing bodies. This could result in continuing uncertainty regarding compliance matters and higher costs necessitated by ongoing revisions to disclosure and governance practices.

Pursuant to Section 404 of the Sarbanes-Oxley Act, or Section 404, we will be required to furnish a report by our management on our internal control over financial reporting beginning with our second filing of an Annual Report on Form 10-K with the SEC after we become a public company. However, while we remain an emerging growth company, we will not be required to include an attestation report on internal control over financial reporting issued by our independent registered public accounting firm. To achieve compliance with Section 404

[Table of Contents](#)

within the prescribed period, we will be engaged in a process to document and evaluate our internal control over financial reporting, which is both costly and challenging. In this regard, we will need to continue to dedicate internal resources, potentially engage outside consultants and adopt a detailed work plan to assess and document the adequacy of internal control over financial reporting, continue steps to improve control processes as appropriate, validate through testing that controls are functioning as documented and implement a continuous reporting and improvement process for internal control over financial reporting. Despite our efforts, there is a risk that we will not be able to conclude, within the prescribed timeframe or at all, that our internal control over financial reporting is effective as required by Section 404. If we identify one or more material weaknesses, it could result in an adverse reaction in the financial markets due to a loss of confidence in the reliability of our financial statements.

Sales of a substantial number of shares of our common stock by our existing stockholders in the public market could cause our stock price to fall.

If our existing stockholders sell, or indicate an intention to sell, substantial amounts of our common stock in the public market after the lock-up and other legal restrictions on resale discussed in this prospectus lapse, the trading price of our common stock could decline. Based on shares of common stock outstanding as of April 30, 2018, upon the closing of this offering we will have outstanding a total of _____ shares of common stock. Of these shares, only the shares of common stock sold in this offering by us, plus any shares sold upon exercise of the underwriters' option to purchase additional shares, will be freely tradable without restriction in the public market immediately following this offering. J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, however, may, in their sole discretion, permit our officers, directors and other stockholders who are subject to these lock-up agreements to sell shares prior to the expiration of the lock-up agreements.

We expect that the lock-up agreements pertaining to this offering will expire 180 days from the date of this prospectus. In addition, shares of common stock that are either subject to outstanding options or reserved for future issuance under our 2018 Stock Option and Incentive Plan, as amended, will become eligible for sale in the public market to the extent permitted by the provisions of various vesting schedules, the lock-up agreements and Rule 144 and Rule 701 under the Securities Act of 1933, as amended (the "Securities Act"). Additionally, the number of shares of our common stock reserved for issuance under our 2018 Stock Option and Incentive Plan will automatically increase each January 1, beginning on January 1, 2019, by 4% of the total number of shares of our common stock outstanding on December 31 of the preceding calendar year, or a lesser number of shares determined by our board of directors. Unless our board of directors elects not to increase the number of shares available for future grant each year, our stockholders may experience additional dilution. If these additional shares of common stock are sold, or if it is perceived that they will be sold, in the public market, the trading price of our common stock could decline.

After this offering, the holders of _____ shares of our common stock as of April 30, 2018 will be entitled to rights with respect to the registration of their shares under the Securities Act, subject to the 180-day lock-up agreements described above. See "Description of Capital Stock—Registration Rights." Registration of these shares under the Securities Act would result in the shares becoming freely tradable without restriction under the Securities Act, except for shares held by affiliates, as defined in Rule 144 under the Securities Act. Any sales of securities by these stockholders could have a material adverse effect on the trading price of our common stock.

We do not anticipate paying any cash dividends on our capital stock in the foreseeable future. Accordingly, stockholders must rely on capital appreciation, if any, for any return on their investment.

We have never declared nor paid cash dividends on our capital stock. We currently plan to retain all of our future earnings, if any, to finance the operation, development and growth of our business. In addition, the terms of any future debt or credit agreements may preclude us from paying dividends. As a result, capital appreciation, if any, of our common stock will be your sole source of gain for the foreseeable future.

Concentration of ownership of our common stock among our existing executive officers, directors and principal stockholders may prevent new investors from influencing significant corporate decisions.

Based upon shares outstanding as of April 30, 2018, and after giving effect to the conversion of all outstanding shares of preferred stock into shares of our common stock, upon the closing of this offering, our executive officers and directors, combined with our stockholders who owned more than 5% of our outstanding common stock before this offering and their affiliates, will, in the aggregate, beneficially own shares representing approximately % of our common stock. This concentration of ownership control may:

- delay, defer or prevent a change in control;
- entrench our management or the board of directors; or
- impede a merger, consolidation, takeover or other business combination involving us that other stockholders may desire.

Some of these persons or entities may have interests different than yours. For example, because many of these stockholders purchased their shares at prices substantially below the price at which shares are being sold in this offering and have held their shares for a longer period, they may be more interested in selling our company to an acquirer than other investors or they may want us to pursue strategies that deviate from the interests of other stockholders.

Provisions in our corporate charter documents and under Delaware law may prevent or frustrate attempts by our stockholders to change our management or hinder efforts to acquire a controlling interest in us.

Provisions in our corporate charter and our bylaws that will become effective upon the closing of this offering may discourage, delay or prevent a merger, acquisition or other change in control of us that stockholders may consider favorable, including transactions in which you might otherwise receive a premium for your shares. These provisions could also limit the price that investors might be willing to pay in the future for shares of our common stock, thereby depressing the market price of our common stock. In addition, because our board of directors is responsible for appointing the members of our management team, these provisions may frustrate or prevent any attempts by our stockholders to replace or remove our current management by making it more difficult for stockholders to replace members of our board of directors. Among other things, these provisions:

- establish a classified board of directors such that all members of the board are not elected at one time;
- allow the authorized number of our directors to be changed only by resolution of our board of directors;
- limit the manner in which stockholders can remove directors from the board;
- establish advance notice requirements for nominations for election to the board of directors or for proposing matters that can be acted on at stockholder meetings;
- require that stockholder actions must be effected at a duly called stockholder meeting and prohibit actions by our stockholders by written consent;
- limit who may call a special meeting of stockholders;
- authorize our board of directors to issue preferred stock without stockholder approval, which could be used to institute a “poison pill” that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our board of directors; and
- require the approval of the holders of at least % of the votes that all our stockholders would be entitled to cast to amend or repeal certain provisions of our charter or bylaws.

Moreover, because we are incorporated in Delaware, we are governed by the provisions of Section 203 of the General Corporation Law of the State of Delaware, which prohibits a person who owns in excess of 15% of our outstanding voting stock from merging or combining with us for a period of three years after the date of the

[Table of Contents](#)

transaction in which the person acquired in excess of 15% of our outstanding voting stock, unless the merger or combination is approved in a prescribed manner. This could discourage, delay or prevent someone from acquiring us or merging with us, whether or not it is desired by, or beneficial to, our stockholders. This could also have the effect of discouraging others from making tender offers for our common stock, including transactions that may be in your best interests. These provisions may also prevent changes in our management or limit the price that investors are willing to pay for our stock.

Our amended and restated bylaws will provide that, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for most legal actions between us and our stockholders, which could limit our stockholders' ability to obtain a favorable judicial forum for disputes with us or our directors, officers, employees or agents.

Pursuant to our amended and restated bylaws, as will be in effect upon the completion of this offering, unless we consent in writing to the selection of an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (1) any derivative action or proceeding brought on our behalf, (2) any action asserting a claim of or based on a breach of a fiduciary duty owed by any of our current or former directors, officers or other employees to us or our stockholders, (3) any action asserting a claim against us or any of our current or former directors, officers, employees or stockholders arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws or (4) any action asserting a claim governed by the internal affairs doctrine. Our amended and restated bylaws will further provide that the United States District Court for the District of Massachusetts will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. In addition, our amended and restated bylaws will provide that any person or entity purchasing or otherwise acquiring any interest in shares of our common stock is deemed to have notice of and consented to the foregoing provisions. We have chosen the United States District Court for the District of Massachusetts as the exclusive forum for such causes of action because our principal executive offices are located in Cambridge, Massachusetts. Some companies that have adopted similar federal district court forum selection provisions are currently subject to a suit in the Court of Chancery of the State of Delaware brought by stockholders who assert that the federal district court forum selection provision is not enforceable. We recognize that the federal district court forum selection clause may impose additional litigation costs on stockholders who assert the provision is not enforceable and may impose more general additional litigation costs in pursuing any such claims, particularly if the stockholders do not reside in or near the Commonwealth of Massachusetts. Additionally, the forum selection clauses in our amended and restated bylaws may limit our stockholders' ability to obtain a favorable judicial forum for disputes with us. Alternatively, if the federal district court forum selection provision is found inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could have an adverse effect on our business, financial condition or results of operations. The United States District Court for the District of Massachusetts may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments may be more or less favorable to us than our stockholders.

If securities or industry analysts do not publish research or publish inaccurate or unfavorable research about our business, our share price and trading volume could decline.

The trading market for our common stock will be influenced by the research and reports that industry or securities analysts publish about us or our business. We do not currently have and may never obtain research coverage by securities and industry analysts. If no or few securities or industry analysts commence coverage of us, or one or more of the analysts who cover us issues an adverse opinion about our company, our stock price would likely decline. If one or more of these analysts ceases research coverage of us or fails to regularly publish reports on us, we could lose visibility in the financial markets, which in turn could cause our stock price or trading volume to decline.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, including the sections entitled “Prospectus Summary,” “Risk Factors,” “Management’s Discussion and Analysis of Financial Condition and Results of Operations” and “Business,” contains forward-looking statements that are based on our management’s belief and assumptions and on information currently available to our management. Although we believe that the expectations reflected in these forward-looking statements are reasonable, these statements relate to our strategy, future operations, future financial position, future revenue, projected costs, prospects, plans, objectives of management and expected market growth, and involve known and unknown risks, uncertainties and other factors that may cause our actual results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied by these forward-looking statements. Forward-looking statements in this prospectus include, but are not limited to, statements about:

- our expected uses of the net proceeds to us from this offering;
- the timing and the success of clinical trials of MGTA-456 and any other product candidates;
- the outcomes of our preclinical studies, including under our C200 program;
- our ability to enroll patients in our clinical trials at the pace that we project;
- whether the results of our trials will be sufficient to support domestic or foreign regulatory approvals for MGTA-456 or any other product candidates we may develop;
- regulatory actions with respect to our product candidates or our competitors’ products and product candidates;
- our ability to obtain, including on an expedited basis, and maintain regulatory approval of MGTA-456 or any other product candidates we may develop;
- the level of expenses related to any of our product candidates or clinical development programs;
- our expectation that our existing capital resources and the net proceeds from this offering will be sufficient to enable us to fund our planned development of MGTA-456 and any other product candidates we may identify and pursue;
- the benefits of the use of MGTA-456 or any other product candidate, if approved;
- our ability to successfully commercialize MGTA-456 or any other product candidates we may identify and pursue, if approved;
- our ability to successfully find collaborators for E478 or any of our current and future programs and product candidates;
- the rate and degree of market acceptance of MGTA-456 or any other product candidates we may identify and pursue;
- our ability to obtain orphan drug designation for any of our product candidates we may identify;
- our expectations regarding government and third-party payor coverage and reimbursement;
- our ability to manufacture MGTA-456 or any other product candidate in conformity with the Food and Drug Administration’s requirements and to scale up manufacturing of our product candidates to commercial scale, if approved;
- our ability to successfully build a specialty sales force and commercial infrastructure;
- our ability to compete with companies currently producing or engaged in the clinical development of treatments for the disease indications that we pursue and treatment modalities that we develop;
- our reliance on third parties to conduct our clinical trials;

[Table of Contents](#)

- our reliance on third-party contract manufacturers to manufacture and supply our product candidates for us;
- our ability to retain and recruit key personnel;
- our ability to obtain and maintain intellectual property protection for MGTA-456 or any other product candidates we may identify and pursue;
- our estimates of our expenses, ongoing losses, future revenue, capital requirements and our needs for or ability to obtain additional financing;
- our expectations regarding the time during which we will be an emerging growth company under the JOBS Act;
- our financial performance; and
- developments and projections relating to our competitors or our industry.

In some cases, you can identify forward-looking statements by terminology such as “may,” “will,” “could”, “should,” “expects,” “intends,” “plans,” “anticipates,” “believes,” “estimates,” “predicts,” “projects”, “potential,” “continue” or the negative of these terms or other comparable terminology. These statements are only predictions. You should not place undue reliance on forward-looking statements because they involve known and unknown risks, uncertainties and other factors, which are, in some cases, beyond our control and which could materially affect results. Factors that may cause actual results to differ materially from current expectations include, among other things, those listed under “Risk Factors” and elsewhere in this prospectus. If one or more of these risks or uncertainties occur, or if our underlying assumptions prove to be incorrect, actual events or results may vary significantly from those implied or projected by the forward-looking statements. No forward-looking statement is a guarantee of future performance. You should read this prospectus and the documents that we reference in this prospectus and have filed with the SEC as exhibits to the registration statement, of which this prospectus is a part, completely and with the understanding that our actual future results may be materially different from any future results expressed or implied by these forward-looking statements.

The forward-looking statements in this prospectus represent our views as of the date of this prospectus. We anticipate that subsequent events and developments will cause our views to change. However, while we may elect to update these forward-looking statements at some point in the future, we assume no obligation to update or revise any forward-looking statements except to the extent required by applicable law. You should, therefore, not rely on these forward-looking statements as representing our views as of any date subsequent to the date of this prospectus.

This prospectus also contains estimates, projections and other information concerning our industry, our business, and the markets for certain diseases, including data regarding the estimated size of those markets, and the incidence and prevalence of certain medical conditions. Information that is based on estimates, forecasts, projections, market research or similar methodologies is inherently subject to uncertainties and actual events or circumstances may differ materially from events and circumstances reflected in this information. Unless otherwise expressly stated, we obtained this industry, business, market and other data from reports, research surveys, studies and similar data prepared by market research firms and other third parties, industry, medical and general publications, government data and similar sources.

USE OF PROCEEDS

We estimate that our net proceeds from the sale of shares of our common stock in this offering will be approximately \$ million, or \$ million if the underwriters exercise in full their option to purchase additional shares, assuming an initial public offering price of \$ per share, the midpoint of the price range set forth on the cover page of this prospectus, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ per share, the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the net proceeds to us from this offering by \$ million, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) our net proceeds from this offering by \$ million, assuming no change in the assumed initial public offering price per share and after deducting underwriting discounts and commissions and estimated offering expenses payable by us.

We intend to use the net proceeds from this offering and our cash and cash equivalents on hand as follows:

- Approximately \$ million to fund the development of our lead conditioning program and related product candidates, including establishing GMP manufacturing capabilities and completing IND-enabling studies for our lead conditioning program;
- Approximately \$ million to fund development of MGTA-456, including the completion of our ongoing Phase II clinical trial in patients with inherited metabolic diseases, initiation of a pivotal clinical trial for inherited metabolic diseases, evaluating additional indications beyond inherited metabolic diseases such as sickle cell disease and blood cancers, and planned expansion of our late-stage clinical and early commercial manufacturing capabilities through third parties;
- Approximately \$ million to fund the development of MGTA-145, including establishing GMP manufacturing capabilities, initiation and completion of a first-in-human study and initiation of a proof-of-concept clinical trial; and
- The remaining proceeds, if any, to fund new and ongoing research and development activities, our new product engine, working capital and other general corporate purposes, which may include funding for the hiring of additional personnel, capital expenditures and the costs of operating as a public company.

Based on our current plans, we believe our cash and cash equivalents, together with the net proceeds to us from this offering, will be sufficient to fund our operations through .

We may also use a portion of the net proceeds to in-license, acquire or invest in new businesses, technology or assets. Although we have no specific agreements, commitments or understandings with respect to any in-license or acquisition, we evaluate such opportunities and engage in related discussions with other companies from time to time.

This expected use of the net proceeds from this offering represents our intentions based upon our current plans and business conditions. As of the date of this prospectus, we cannot predict with certainty all of the particular uses for the net proceeds to be received upon the completion of this offering or the amounts that we will actually spend on the uses set forth above. The amounts and timing of our actual expenditures and the extent of our preclinical and clinical development activities may vary significantly depending on numerous factors, including the progress of our development efforts, the status of and results from preclinical studies and our ongoing clinical trial or any clinical trials we may commence in the future, our ability to take advantage of expedited programs or to obtain regulatory approval for MGTA-456 and any other product candidates we may identify and pursue, the timing and costs associated with the manufacture and supply of MGTA-456 and any other product candidates we may identify and pursue for clinical development or commercialization, and any unforeseen cash needs. As a result, our management will retain broad discretion over the allocation of the net proceeds from this offering.

Pending our use of the net proceeds from this offering, we intend to invest the net proceeds in a variety of capital preservation investments, including short-term, investment-grade, interest-bearing instruments and U.S. government securities.

DIVIDEND POLICY

We have never declared or paid dividends on our capital stock. We do not anticipate paying any dividends on our capital stock in the foreseeable future. We currently intend to retain all available funds and any future earnings to fund the development and growth of our business. Any future determination to declare dividends will be subject to the discretion of our board of directors and will depend on various factors, including applicable laws, our results of operations, financial condition, future prospects and any other factors deemed relevant by our board of directors. Investors should not purchase our common stock with the expectation of receiving cash dividends.

CAPITALIZATION

The following table sets forth our cash and cash equivalents and our capitalization as of March 31, 2018:

- on an actual basis;
- on a pro forma basis to give effect to:
 - our sale of 11,223,102 shares of Series C redeemable convertible preferred stock in April 2018 for gross proceeds of \$52.3 million;
 - the automatic conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of 60,401,629 shares of our common stock upon the closing of this offering; and
 - the filing and effectiveness of our amended and restated certificate of incorporation; and
- on a pro forma as adjusted basis to give further effect to our issuance and sale of _____ shares of our common stock in this offering at an assumed initial public offering price of \$ _____ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The pro forma as adjusted information below is illustrative only, and our capitalization following the closing of this offering will be adjusted based on the actual initial public offering price and other terms of this offering determined at pricing. You should read this table together with our financial statements and the related notes appearing at the end of this prospectus and the sections of this prospectus titled “Selected Financial Data” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations.”

	At March 31, 2018		
	Actual	Pro Forma	Pro Forma As Adjusted
	(In thousands, except share and per share data)		
Cash and cash equivalents	\$ 41,462	\$ 93,762	
Redeemable convertible preferred stock (Series A and B), \$0.001 par value; 49,178,527 shares authorized, issued and outstanding, actual; no shares authorized, issued or outstanding, pro forma and pro forma as adjusted	92,439	—	
Stockholders’ Equity (Deficit)			
Preferred stock, _____ par value; no shares authorized, issued or outstanding, actual; _____ shares authorized and no shares issued or outstanding, pro forma and pro forma as adjusted	—	—	
Common stock, \$0.001 par value; 70,000,000 shares authorized, 11,494,853 shares issued and 6,770,806 shares outstanding, actual; _____ shares authorized, 71,896,482 shares issued and 67,172,435 shares outstanding, pro forma; _____ shares authorized, _____ shares issued and _____ shares outstanding, pro forma as adjusted	7	67	
Additional paid-in capital	4,511	149,190	
Accumulated deficit	(56,372)	(56,372)	
Total stockholders’ equity (deficit)	(51,854)	92,885	
Total capitalization	\$ 40,585	\$ 92,885	

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ _____ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, total stockholders’ equity and total capitalization

[Table of Contents](#)

by \$ million, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting discounts and commissions. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) the pro forma as adjusted amount of each of cash and cash equivalents, total stockholders' equity and total capitalization by \$ million, assuming no change in the assumed initial public offering price per share and after deducting estimated underwriting discounts and commissions.

The table above does not include:

- 3,583,000 shares of common stock issuable upon the exercise of stock options outstanding as of March 31, 2018 under the 2016 Plan at a weighted average exercise price of \$2.48 per share;
- 2,594,587 shares of common stock reserved and available for future issuance under the 2016 Plan, as of March 31, 2018 (which does not include an increase of 4,870,417 shares of common stock reserved for future issuance under our 2016 Plan effected in April 2018); and
- shares of our common stock reserved for future issuance under our 2018 Plan, which will become effective upon the completion of this offering, as well as any future increases in the number of shares of common stock reserved for future increases in the number of shares of common stock reserved for future issuances under our 2018 Plan.

DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted immediately to the extent of the difference between the initial public offering price per share of our common stock and the pro forma as adjusted net tangible book value per share of our common stock immediately after this offering.

Our historical net tangible book value (deficit) as of March 31, 2018 was \$(53.3) million, or \$(4.63) per share of our common stock. Our historical net tangible book value (deficit) is the amount of our total tangible assets less our total liabilities and preferred stock, which is not included within our stockholders' equity (deficit). Historical net tangible book value per share represents historical net tangible book value (deficit) divided by the 11,494,853 shares of our common stock outstanding as of March 31, 2018, including 4,724,047 shares of unvested restricted stock subject to repurchase by us.

Our pro forma net tangible book value as of March 31, 2018 was \$91.5 million, or \$1.27 per share of our common stock. Pro forma net tangible book value represents the amount of our total tangible assets less our total liabilities, after giving effect to (i) our sale of 11,223,102 shares of Series C redeemable convertible preferred stock in April 2018 for gross proceeds of \$52.3 million and (ii) the automatic conversion of all outstanding shares of our redeemable convertible preferred stock into an aggregate of 60,401,629 shares of our common stock upon the closing of this offering. Pro forma net tangible book value per share represents pro forma net tangible book value divided by the total number of shares outstanding as of March 31, 2018 after giving effect to the pro forma adjustment described above.

After giving further effect to our issuance and sale of _____ shares of our common stock in this offering at an assumed initial public offering price of \$ _____ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us, our pro forma as adjusted net tangible book value as of March 31, 2018 would have been \$ _____ million, or \$ _____ per share. This represents an immediate increase in pro forma as adjusted net tangible book value per share of \$ _____ to existing stockholders and immediate dilution of \$ _____ per share in pro forma as adjusted net tangible book value per share to new investors purchasing common stock in this offering. Dilution per share to new investors is determined by subtracting pro forma as adjusted net tangible book value per share after this offering from the assumed initial public offering price per share paid by new investors. The following table illustrates this dilution on a per share basis:

Assumed initial public offering price per share	\$
Historical net tangible book value (deficit) per share as of March 31, 2018	\$(4.63)
Increase per share attributable to the pro forma adjustment described above	<u>5.90</u>
Pro forma net tangible book value per share as of March 31, 2018	\$ 1.27
Increase in pro forma as adjusted net tangible book value per share attributable to new investors purchasing common stock in this offering	<u> </u>
Pro forma as adjusted net tangible book value per share after this offering	<u> </u>
Dilution per share to new investors purchasing common stock in this offering	<u> </u>

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ _____ per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) our pro forma as adjusted net tangible book value per share after this offering by \$ _____ and dilution per share to new investors purchasing common stock in this offering by \$ _____, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting estimated underwriting

Table of Contents

discounts and commissions. An increase of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase our pro forma as adjusted net tangible book value per share after this offering by \$ [redacted] and decrease the dilution per share to new investors purchasing common stock in this offering by \$ [redacted], assuming no change in the assumed initial public offering price per share and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. A decrease of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would decrease our pro forma as adjusted net tangible book value per share after this offering by \$ [redacted] and increase the dilution per share to new investors purchasing common stock in this offering by \$ [redacted], assuming no change in the assumed initial public offering price and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

If the underwriters fully exercise their option to purchase [redacted] additional shares of common stock in this offering, our pro forma as adjusted net tangible book value per share after this offering would be \$ [redacted] and the dilution in pro forma as adjusted net tangible book value per share to new investors purchasing common stock in this offering would be \$ [redacted], assuming no change in the initial public offering price per share and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The following table summarizes, as of March 31, 2018, on the pro forma as adjusted basis described above, the total number of shares of common stock purchased from us on an as converted to common stock basis, the total consideration paid, or to be paid, and the average price per share paid or to be paid by existing shareholders and by new investors in this offering at an assumed initial public offering price of \$ [redacted] per share, which is the midpoint of the price range set forth on the cover page of this prospectus, before deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. As the table shows, new investors purchasing common stock in this offering will pay an average price per share substantially higher than our existing stockholders paid.

	<u>Shares Purchased</u>		<u>Total Consideration</u>		<u>Average Price</u>
	<u>Number</u>	<u>Percent</u>	<u>Amount</u>	<u>Percentage</u>	<u>Per Share</u>
Existing stockholders		%	\$	%	\$
New investors					\$
Total		<u>100%</u>	<u>\$</u>	<u>100%</u>	

A \$1.00 increase (decrease) in the assumed initial public offering price of \$ [redacted] per share, which is the midpoint of the price range set forth on the cover page of this prospectus, would increase (decrease) the total consideration paid by new investors by \$ [redacted] million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by [redacted] percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by [redacted] percentage points, assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. An increase (decrease) of 1,000,000 shares in the number of shares offered by us, as set forth on the cover page of this prospectus, would increase (decrease) the total consideration paid by new investors by \$ [redacted] million and, in the case of an increase, would increase the percentage of total consideration paid by new investors by [redacted] percentage points and, in the case of a decrease, would decrease the percentage of total consideration paid by new investors by [redacted] percentage points, assuming no change in the assumed initial public offering price per share.

The table above assumes no exercise of the underwriters' option to purchase additional shares in this offering. If the underwriters' option to purchase additional shares is fully exercised, the number of shares of our common stock held by existing stockholders would be reduced to [redacted] % of the total number of shares of our common stock outstanding after this offering, and the number of shares of common stock held by new investors purchasing common stock in this offering would be increased to [redacted] % of the total number of shares of our common stock outstanding after this offering.

[Table of Contents](#)

The number of shares of common stock to be outstanding after this offering is based on 71,896,482 shares of common stock outstanding as of March 31, 2018, which includes 4,724,047 shares of unvested restricted stock subject to repurchase by us, after giving effect to (i) our sale of 11,223,102 shares of Series C redeemable convertible preferred stock in April 2018, for gross proceeds of \$52.3 million and (ii) the automatic conversion of all outstanding shares of our preferred stock and excludes:

- 3,583,000 shares of common stock issuable upon the exercise of stock options outstanding as of March 31, 2018 under the 2016 Plan, at a weighted average exercise price of \$2.48 per share;
- 2,594,587 shares of common stock reserved and available for future issuance under the 2016 Plan, as of March 31, 2018 (which does not include an increase of 4,870,417 shares of common stock reserved for future issuance under our 2016 Plan effected in April 2018); and
- shares of our common stock reserved for future issuance under our 2018 Plan, which will become effective upon the completion of this offering, as well as any future increases in the number of shares of common stock reserved for future increases in the number of shares of common stock reserved for future issuances under our 2018 Plan.

If additional shares are issued in connection with the exercise of outstanding options, if new stock options are issued under our equity incentive plan, or if we issue additional shares of common stock in the future, there will be further dilution to investors purchasing common stock in this offering. In addition, we may choose to raise additional capital because of market conditions or strategic considerations, even if we believe that we have sufficient funds for our current or future operating plans. If we raise additional capital through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

SELECTED FINANCIAL DATA

You should read the following selected financial data together with our financial statements and the related notes appearing at the end of this prospectus and the “Management’s Discussion and Analysis of Financial Condition and Results of Operations” section of this prospectus. We have derived the statement of operations data for the years ended December 31, 2016 and 2017 and the balance sheet data as of December 31, 2016 and 2017 from our audited financial statements appearing at the end of this prospectus. Our historical results are not necessarily indicative of the results that may be expected in the future. We have derived the statement of operations data for the three months ended March 31, 2017 and 2018 and the balance sheet data as of March 31, 2018 from our unaudited interim financial statements appearing at the end of this prospectus. The unaudited interim financial statements have been prepared on the same basis as the audited financial statements and reflect, in the opinion of management, all adjustments of a normal, recurring nature that are necessary for a fair statement of the financial information included in those unaudited interim financial statements. Our historical results are not necessarily indicative of the results that may be expected in the future, and the results for the three months ended March 31, 2018 are not necessarily indicative of results to be expected for the full year or any other period.

	<u>Year Ended December 31,</u>		<u>Three Months Ended March 31,</u>	
	<u>2016</u>	<u>2017</u>	<u>2017</u>	<u>2018</u>
(in thousands, except share and per share data)				
Statement of Operations Data:				
Revenue	\$ —	\$ —	\$ —	\$ —
Operating expenses:				
Research and development	5,782	27,899	3,322	7,849
General and administrative	3,486	7,828	1,489	3,457
Total operating expenses	<u>9,268</u>	<u>35,727</u>	<u>4,811</u>	<u>11,306</u>
Loss from operations	<u>(9,268)</u>	<u>(35,727)</u>	<u>(4,811)</u>	<u>(11,306)</u>
Other income (expense):				
Interest expense	(163)	—	—	—
Interest and other income, net	—	236	—	145
Total other income (expense), net	<u>(163)</u>	<u>236</u>	<u>—</u>	<u>145</u>
Net loss	\$ (9,431)	\$ (35,491)	\$ (4,811)	\$ (11,161)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)	—	—
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)	(354)	—
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634	—	—
Net loss attributable to common stockholders	<u>\$ (9,735)</u>	<u>\$ (35,507)</u>	<u>\$ (5,165)</u>	<u>\$ (11,161)</u>
Net loss per share attributable to common stockholders—basic and diluted	<u>\$ (25.21)</u>	<u>\$ (7.40)</u>	<u>\$ (1.39)</u>	<u>\$ (1.75)</u>
Weighted average common shares outstanding—basic and diluted	<u>386,083</u>	<u>4,798,213</u>	<u>3,716,695</u>	<u>6,373,006</u>
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)		<u>\$ (0.80)</u>		<u>\$ (0.20)</u>
Pro forma weighted average common shares outstanding—basic and diluted (unaudited)		<u>44,294,374</u>		<u>55,551,533</u>

[Table of Contents](#)

	December 31, 2017	March 31, 2018
	(in thousands)	
Balance Sheet Data:		
Cash and cash equivalents	\$ 51,402	\$ 41,462
Working capital ⁽¹⁾	48,361	37,134
Total assets	54,463	46,078
Redeemable convertible preferred stock	92,439	92,439
Total stockholders' deficit	(42,118)	(51,854)

(1) We define working capital as current assets less current liabilities.

MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with the section entitled "Selected Financial Data" and our financial statements and related notes appearing at the end of this prospectus. Some of the information contained in this discussion and analysis or set forth elsewhere in this prospectus, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. As a result of many factors, including those factors set forth in the "Risk Factors" section of this prospectus, our actual results could differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients. Transplant is a well-established and often curative medical procedure, and emerging data on stem cell gene therapy, which is bone marrow transplant using gene-modified stem cells, suggest the potential for meaningful benefit with this newer form of transplant. Bone marrow transplant and stem cell gene therapies use the same widely-adopted decades old transplant process. As it exists today, bone marrow transplant is a large market opportunity, and improvements to the current approaches could extend bone marrow transplant to more patients. The ability to treat patients with a bone marrow transplant is limited by the challenge of obtaining sufficient cells to perform the procedure, the inherent morbidity and mortality of current methods used to prepare patients for transplant, and complications following transplant.

At Magenta, we believe we are uniquely positioned to overcome these challenges and to lead a new era in transplant medicine. Our portfolio of product candidates includes biologics, small molecules and a cell therapy designed to address deficiencies in existing approaches and extend the curative power of bone marrow transplant to more patients across many diseases. Currently, only a fraction of eligible patients with these diseases receive a transplant because the risks and challenges outweigh the potential for a cure. These include diseases where bone marrow transplant is a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and autoimmune diseases. Emerging clinical data suggest that bone marrow transplant may represent a breakthrough approach with curative potential for patients with severe autoimmune diseases. For example, recent results from multiple clinical trials show that patients with autoimmune diseases, including multiple sclerosis and scleroderma, can be cured with a transplant. However, based on our epidemiology analyses, currently only approximately 1 to 2% of eligible patients with multiple sclerosis or scleroderma in the United States and Europe receive a bone marrow transplant.

To address the major unmet medical needs in the existing bone marrow transplant process, we are developing a stem cell biology discovery platform and building a comprehensive portfolio of novel therapeutics. Our programs will improve stem cell dose (expansion), stem cell collection (mobilization), patient preparation for transplant (conditioning) and potential post-transplant complications, to address key limitations of the bone marrow transplant process to allow more patients to benefit. Within our expansion program, MGTA-456, our most advanced clinical product candidate, is a cell therapy that has achieved clinical proof of concept in 36 patients with blood cancers and is now being studied in patients with fatal inherited metabolic diseases. MGTA-456 is produced by significantly expanding the number of stem cells in cord blood units, and has the potential to allow product candidate more patients to have a better chance for a successful stem cell transplant. Within our mobilization program, MGTA-145 is focused on enabling physicians to more easily harvest a greater number of blood stem cells, known as hematopoietic stem cells or HSCs, from patients and donors to improve patient outcomes. Our targeted transplant conditioning programs, which prepare the patient for transplant, are designed to selectively remove stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the

[Table of Contents](#)

decades-old radiation and chemotherapy-based approaches which are still the only available options. Our post-transplant complications program is designed to target the donor immune cells within the patient that cause Graft vs. Host Disease, or GvHD, which can be a fatal complication of transplant.

We intend to become a fully integrated discovery, development and commercial company in the field of transplant medicine. We believe that our product portfolio will offer significant commercial synergies. We are developing our products so that they can each be used individually or in combination with each other. As a result, our portfolio could be utilized in a manner tailored to the patient's disease, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.

Since our inception in 2015, we have focused substantially all of our efforts and financial resources on organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying potential product candidates, and undertaking preclinical studies, and in the case of MGTA-456, clinical trials. We do not have any products approved for sale and have not generated any revenue from product sales. To date, we have funded our operations primarily with proceeds from the sales of redeemable convertible preferred stock and issuance of convertible notes. Through March 31, 2018, we had received net proceeds of \$82.7 million from sales of our redeemable convertible preferred stock (including proceeds from convertible notes, which converted into redeemable convertible preferred stock in 2016). In April 2018, we received gross proceeds of \$52.3 million from our sale of our Series C redeemable convertible preferred stock, or Series C preferred stock.

Since our inception, we have incurred significant operating losses. Our ability to generate product revenue sufficient to achieve profitability will depend heavily on the successful development and eventual commercialization of one or more of our product candidates. Our net loss was \$9.4 million for the year ended December 31, 2016, \$35.5 million for the year ended December 31, 2017 and \$11.2 million for the three months ended March 31, 2018. As of March 31, 2018, we had an accumulated deficit of \$56.4 million. We expect to continue to incur significant expenses and increasing operating losses for at least the next several years. We expect our expenses and capital requirements will increase substantially in connection with our ongoing activities, particularly as we:

- continue enrollment in our Phase II clinical trial of MGTA-456;
- prepare for and initiate our preclinical studies and clinical trials of our product candidates;
- develop any other future product candidates we may choose to pursue;
- continue research and development and drug discovery and initiate additional clinical trials;
- seek marketing approval for any of our product candidates that successfully complete clinical development;
- maintain compliance with applicable regulatory requirements;
- develop and scale up our capabilities to support our ongoing preclinical activities and clinical trials for our product candidates and commercialization of any of our product candidates for which we obtain marketing approval;
- maintain, expand, protect and enforce our intellectual property portfolio;
- develop and expand our sales, marketing and distribution capabilities for our product candidates for which we obtain marketing approval, if any; and
- expand our operational, financial and management systems and increase personnel, including to support our clinical development and commercialization efforts and our operations as a public company.

We will not generate revenue from product sales unless and until we successfully complete clinical development and obtain regulatory approval for our product candidates. If we obtain regulatory approval for any of our

product candidates, we expect to incur significant expenses related to developing our commercialization capability to support product sales, marketing and distribution. Further, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company.

As a result, we will need substantial additional funding to support our continuing operations and pursue our growth strategy. Until such time as we can generate significant revenue from product sales, if ever, we expect to finance our operations through a combination of equity offerings, debt financings, collaborations, strategic alliances and marketing, distribution or licensing arrangements. We may be unable to raise additional funds or enter into such other agreements or arrangements when needed on favorable terms, or at all. If we fail to raise capital or enter into such agreements as, and when, needed, we may have to significantly delay, scale back or discontinue the development and commercialization of one or more of our product candidates.

Because of the numerous risks and uncertainties associated with pharmaceutical product development, we are unable to accurately predict the timing or amount of increased expenses or when or if we will be able to achieve or maintain profitability. Even if we are able to generate product sales, we may not become profitable. If we fail to become profitable or are unable to sustain profitability on a continuing basis, then we may be unable to continue our operations at planned levels and be forced to reduce or terminate our operations.

As of March 31, 2018, we had cash and cash equivalents of \$41.5 million. In April 2018, we received gross proceeds of \$52.3 million from the sale of our Series C preferred stock. We believe that the net proceeds from this offering, together with our existing cash and cash equivalents, will enable us to fund our operating expenses and capital expenditure requirements through . See “—Liquidity and Capital Resources.”

Components of Our Results of Operations

Revenue

To date, we have not generated any revenue from product sales and do not expect to generate any revenue from the sale of products in the foreseeable future. If our development efforts for our product candidates are successful and result in regulatory approval, we may generate revenue in the future from product sales. If we enter into license or collaboration agreements for any of our product candidates or intellectual property, we may generate revenue in the future from payments as a result of such license or collaboration agreements. We cannot predict if, when, or to what extent we will generate revenue from the commercialization and sale of our product candidates. We may never succeed in obtaining regulatory approval for any of our product candidates.

Operating Expenses

Research and Development Expenses

Research and development expenses consist primarily of costs incurred for our research activities, including our drug discovery efforts, and the development of our product candidates, which include:

- employee-related expenses, including salaries and related costs, and stock-based compensation expense, for employees engaged in research and development functions;
- expenses incurred in connection with the preclinical and clinical development of our product candidates, including under agreements with contract research organizations, or CROs;
- the cost of consultants and contract manufacturing organizations, or CMOs, that manufacture drug products for use in our preclinical studies and clinical trials;
- facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities, insurance and supplies; and
- payments made under third-party licensing agreements.

[Table of Contents](#)

We expense research and development costs to operations as incurred. Advance payments for goods or services to be received in the future for use in research and development activities are recorded as prepaid expenses. The prepaid amounts are expensed as the related goods are delivered or the services are performed.

Our direct research and development expenses are tracked on a program-by-program basis and consist primarily of external costs, such as fees paid to consultants, central laboratories, contractors, CMOs and CROs in connection with our preclinical and clinical development activities. We do not allocate employee costs, costs associated with our platform technology or facility expenses, including depreciation or other indirect costs, to specific product development programs because these costs are deployed across multiple product development programs and, as such, are not separately classified.

The table below summarizes our research and development expenses incurred by development program:

	Year Ended December 31,		Three Months Ended March 31,	
	2016	2017	2017	2018
	(in thousands)			
Conditioning	\$ 303	\$ 6,259	\$ 1,208	\$ 2,797
Mobilization	431	1,416	319	437
Expansion	13	11,045	156	866
GvHD	—	—	—	228
Unallocated expenses	5,035	9,179	1,639	3,521
Total research and development expenses	<u>\$ 5,782</u>	<u>\$27,899</u>	<u>\$ 3,322</u>	<u>7,849</u>

The successful development and commercialization of our product candidates is highly uncertain. This is due to the numerous risks and uncertainties, including the following:

- successful completion of preclinical studies and clinical trials;
- receipt and related terms of marketing approvals from applicable regulatory authorities;
- raising additional funds necessary to complete clinical development of and commercialize our product candidates;
- obtaining and maintaining patent, trade secret and other intellectual property protection and regulatory exclusivity for our product candidates;
- making arrangements with third-party manufacturers, or establishing manufacturing capabilities, for both clinical and commercial supplies of our product candidates;
- developing and implementing marketing and reimbursement strategies;
- establishing sales, marketing and distribution capabilities and launching commercial sales of our products, if and when approved, whether alone or in collaboration with others;
- acceptance of our products, if and when approved, by patients, the medical community and third-party payors;
- effectively competing with other therapies;
- obtaining and maintaining third-party coverage and adequate reimbursement;
- protecting and enforcing our rights in our intellectual property portfolio; and
- maintaining a continued acceptable safety profile of the products following approval.

A change in the outcome of any of these variables with respect to the development of any of our product candidates would significantly change the costs and timing associated with the development of that product candidate. We may never succeed in obtaining regulatory approval for any of our product candidates.

[Table of Contents](#)

Research and development activities are central to our business model. Product candidates in later stages of clinical development generally have higher development costs than those in earlier stages of clinical development, primarily due to the increased size and duration of later-stage clinical trials. We expect research and development costs to increase significantly for the foreseeable future as our product candidate development programs progress. However, we do not believe that it is possible at this time to accurately project total program-specific expenses through commercialization. There are numerous factors associated with the successful commercialization of any of our product candidates, including future trial design and various regulatory requirements, many of which cannot be determined with accuracy at this time based on our stage of development. Additionally, future commercial and regulatory factors beyond our control will impact our clinical development programs and plans.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and related costs, and stock-based compensation, for personnel in executive, finance and administrative functions. General and administrative expenses also include direct and allocated facility-related costs as well as professional fees for legal, patent, consulting, accounting and audit services.

We anticipate that our general and administrative expenses will increase in the future as we increase our headcount to support our continued research activities and development of our product candidates. We also anticipate that we will incur increased accounting, audit, legal, regulatory, compliance, and director and officer insurance costs as well as investor and public relations expenses associated with operating as a public company.

Other Income (Expense)

Interest Expense. Interest expense consisted of interest accrued on convertible promissory notes, all of which notes and accrued interest were converted into redeemable convertible preferred stock in November 2016.

Interest and Other Income, Net. Interest and other income, net, consists of interest income and insignificant amounts of miscellaneous income and expense unrelated to our core operations.

Income Taxes

Since our inception, we have not recorded any U.S. federal or state income tax benefits for the net losses we have incurred in each year or for our earned research and development tax credits, due to our uncertainty of realizing a benefit from those items. As of December 31, 2017, we had federal and state net operating loss carryforwards of \$18.7 million and \$19.3 million, respectively, which begin to expire in 2035. As of December 31, 2017, we also had federal and state research and development tax credit carryforwards of \$1.0 million and \$0.4 million, respectively, which begin to expire in 2035 and 2030, respectively.

On December 22, 2017, the Tax Cuts and Jobs Act, or TCJA, was signed into United States law. The TCJA includes a number of changes to existing tax law, including, among other things, a permanent reduction in the federal corporate income tax rate from 35% to 21%, effective as of January 1, 2018, as well as limitation of the deduction for net operating losses to 80% of annual taxable income and elimination of net operating loss carrybacks, in each case, for losses arising in taxable years beginning after December 31, 2017 (though any such net operating losses may be carried forward indefinitely). The tax rate change resulted in (i) a reduction in the gross amount of our deferred tax assets as of December 31, 2017, without an impact on the net amount of our deferred tax assets, which are recorded with a full valuation allowance, and (ii) no income tax expense or benefit being recognized as of the enactment date of the TCJA.

Critical Accounting Policies and Significant Judgments and Estimates

Our financial statements are prepared in accordance with generally accepted accounting principles in the United States, or GAAP. The preparation of our financial statements and related disclosures requires us to make

[Table of Contents](#)

estimates and judgments that affect the reported amounts of assets, liabilities, costs and expenses, and the disclosure of contingent assets and liabilities in our financial statements. We base our estimates on historical experience, known trends and events and various other factors that we believe are reasonable under the circumstances, the results of which form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. We evaluate our estimates and assumptions on an ongoing basis. Our actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in Note 2 to our financial statements appearing at the end of this prospectus, we believe that the following accounting policies are those most critical to the judgments and estimates used in the preparation of our financial statements.

Accrued Research and Development Expenses

As part of the process of preparing our financial statements, we are required to estimate our accrued research and development expenses. This process involves reviewing open contracts and purchase orders, communicating with our applicable personnel to identify services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for the service when we have not yet been invoiced or otherwise notified of actual costs. The majority of our service providers invoice us in arrears for services performed, on a pre-determined schedule or when contractual milestones are met; however, some require advance payments. We make estimates of our accrued expenses as of each balance sheet date in the financial statements based on facts and circumstances known to us at that time. We periodically confirm the accuracy of the estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include fees paid to:

- vendors in connection with the preclinical development activities;
- CROs in connection with preclinical and clinical trials;
- CMOs in connection with the production of preclinical and clinical trial materials; and
- investigative sites in connection with clinical trials.

We base our expenses related to preclinical studies and clinical trials on our estimates of the services received and efforts expended pursuant to quotes and contracts with multiple research institutions and CROs that conduct and manage preclinical studies and clinical trials on our behalf. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows. There may be instances in which payments made to our vendors will exceed the level of services provided and result in a prepayment of the expense. In accruing service fees, we estimate the time period over which services will be performed and the level of effort to be expended in each period. If the actual timing of the performance of services or the level of effort varies from the estimate, we adjust the accrual or prepaid expense accordingly. Although we do not expect our estimates to be materially different from amounts actually incurred, our understanding of the status and timing of services performed relative to the actual status and timing of services performed may vary and may result in reporting amounts that are too high or too low in any particular period. To date, there have not been any material adjustments to our prior estimates of accrued research and development expenses.

Determination of Fair Value of Common and Preferred Stock

As there has been no public market for our common stock to date, the estimated fair value of our common stock has been determined by our board of directors as of the date of each award grant, with input from management, considering our most recently available third-party valuations of common stock and our board of directors' assessment of additional objective and subjective factors that it believed were relevant and which may have changed from the date of the most recent valuation through the date of the grant. These third-party valuations were performed in accordance with the guidance outlined in the American Institute of Certified Public

[Table of Contents](#)

Accountants' Accounting and Valuation Guide, *Valuation of Privately-Held-Company Equity Securities Issued as Compensation*. Our common stock valuations were prepared using either an option pricing method, or OPM, or a hybrid method, both of which used market approaches to estimate our enterprise value. The OPM treats common stock and preferred stock as call options on the total equity value of a company, with exercise prices based on the value thresholds at which the allocation among the various holders of a company's securities changes. Under this method, the common stock has value only if the funds available for distribution to stockholders exceeded the value of the preferred stock liquidation preferences at the time of the liquidity event, such as a strategic sale or a merger. A discount for lack of marketability of the common stock is then applied to arrive at an indication of value for the common stock. The hybrid method is a probability-weighted expected return method, or PWERM, where the equity value in one or more scenarios is calculated using an OPM. The PWERM is a scenario-based methodology that estimates the fair value of common stock based upon an analysis of future values for the company, assuming various outcomes. The common stock value is based on the probability-weighted present value of expected future investment returns considering each of the possible outcomes available as well as the rights of each class of stock. The future value of the common stock under each outcome is discounted back to the valuation date at an appropriate risk-adjusted discount rate and probability weighted to arrive at an indication of value for the common stock. These third-party valuations were performed at various dates, which resulted in valuations of our common stock of \$1.87 per share as of April 30, 2017, \$2.98 per share as of December 31, 2017 and \$3.67 per share as of April 2, 2018. In addition to considering the results of these third-party valuations, our board of directors considered various objective and subjective factors to determine the fair value of our common stock as of each grant date, which may be at a date later than the most recent third-party valuation date, including:

- the prices at which we sold shares of preferred stock and the superior rights and preferences of the preferred stock relative to our common stock at the time of each grant;
- the progress of our research and development programs, including the status of preclinical studies and clinical trials for our product candidates;
- our stage of development and commercialization and our business strategy;
- external market conditions affecting the biotechnology industry, and trends within the biotechnology industry;
- our financial position, including cash on hand, and our historical and forecasted performance and operating results;
- the lack of an active public market for our common stock and our preferred stock;
- the likelihood of achieving a liquidity event, such as an initial public offering, or IPO, or a sale of our company in light of prevailing market conditions; and
- the analysis of IPOs and the market performance of similar companies in the biopharmaceutical industry.

The assumptions underlying these valuations represent management's best estimates, which involve inherent uncertainties and the application of management judgment. As a result, if factors or expected outcomes change and we use significantly different assumptions or estimates, our stock-based compensation expense could be materially different.

Following the closing of this offering, the fair value of our common stock will be determined based on the quoted market price of our common stock.

We estimated the fair value of our Series A redeemable convertible preferred stock, or Series A preferred stock, and Series B redeemable convertible preferred stock, or Series B preferred stock, as of April 30, 2017 to be \$2.71 per share and \$3.88 per share, respectively, using the OPM valuation method and other relevant factors as described above.

Common and Preferred Stock Issued for Licenses

When common and preferred stock are issued in exchange for a license, we determine the fair value of the common and preferred stock granted as either the fair value of the consideration received or the fair value of the equity instruments issued. For the common and preferred stock issued for licenses during the years ended December 31, 2016 and 2017, we determined the expense based on the fair value of the stock issued as it was more readily determinable.

Stock-Based Compensation

We measure all stock options and other stock-based awards granted to employees and directors based on the fair value on the date of the grant and recognize compensation expense of those awards over the requisite service period, which is generally the vesting period of the respective award. Generally, we issue stock options and restricted stock awards, or RSAs, with service-based vesting conditions and record the expense for these awards using the straight-line method. We have historically granted stock options with exercise prices equivalent to the fair value of our common stock as of the date of the grant. We estimate the fair value of each stock option award using the Black-Scholes option-pricing model, which uses as inputs the fair value of our common stock and assumptions we make for the volatility of our common stock, the expected term of our stock options, the risk-free interest rate for a period that approximates the expected term of our stock options and our expected dividend yield and the then-current fair value of common stock for restricted stock.

We measure the fair value of stock-based awards granted to non-employees on the date at which the related service is complete. Compensation expense is recognized over the period during which services are rendered by such non-employee consultants until completed. At the end of each financial reporting period prior to completion of the service, the fair value of these awards is re-measured using the then-current fair value of our common stock and updated assumption inputs in the Black-Scholes option-pricing model for options and the then-current fair value of our common stock for restricted stock.

We do not estimate and apply a forfeiture rate as we have elected to account for forfeitures as they occur.

Grants of Stock-Based Awards

The following table sets forth by grant date the number of shares of restricted stock and shares subject to options granted between January 1, 2017 and April 30, 2018, the per share exercise price of the options, the fair value of common stock per share on each grant date, and the per share estimated fair value of the award:

<u>Grant Date</u>	<u>Type of Award</u>	<u>Number of Shares Subject to Award</u>	<u>Per Share Exercise Price of Options</u>	<u>Fair Value of Common Stock per Share on Grant Date</u>	<u>Per Share Estimated Fair Value of Award</u>
March 31, 2017	RSA	565,000	—	\$ 1.87	\$ 1.87
September 28, 2017	Option	1,351,000	\$ 1.87	\$ 1.87	\$ 1.28
October 7, 2017	Option	12,500	\$ 1.87	\$ 1.87	\$ 1.26
November 30, 2017	Option	250,000	\$ 1.87	\$ 1.87	\$ 1.27
January 31, 2018	Option	1,969,500	\$ 2.98	\$ 2.98	\$ 2.05
April 27, 2018	Option	1,187,560	\$ 3.67	\$ 3.67	\$ 2.64

Results of Operations

Comparison of the Three Months Ended March 31, 2017 and 2018

The following table summarizes our results of operations for the three months ended March 31, 2017 and 2018:

	Three Months Ended March 31,		Change
	2017	2018	
	(in thousands)		
Revenue	\$ —	\$ —	\$ —
Operating expenses:			
Research and development	3,322	7,849	4,527
General and administrative	1,489	3,457	1,968
Total operating expenses	<u>4,811</u>	<u>11,306</u>	<u>6,495</u>
Loss from operations	<u>(4,811)</u>	<u>(11,306)</u>	<u>(6,495)</u>
Other income (expense):			
Interest and other income, net	—	145	145
Total other income (expense), net	<u>—</u>	<u>145</u>	<u>145</u>
Net loss	<u><u>\$(4,811)</u></u>	<u><u>\$(11,161)</u></u>	<u><u>\$(6,350)</u></u>

Research and Development Expenses

	Three Months Ended March 31,		Change
	2017	2018	
	(in thousands)		
Direct research and development expenses by program:			
Conditioning	\$1,208	\$2,797	\$1,589
Mobilization	319	437	118
Expansion	156	866	710
GvHD	—	228	228
Unallocated expenses:			
Personnel related (including stock-based compensation)	806	1,918	1,112
Consultant fees	311	775	464
Facility related and other	<u>522</u>	<u>828</u>	<u>306</u>
Total research and development expenses	<u><u>\$3,322</u></u>	<u><u>\$7,849</u></u>	<u><u>\$4,527</u></u>

Expenses related to our conditioning program increased primarily as a result of costs incurred in connection with our collaboration agreement with Heidelberg Pharma Research GmbH for an upfront technology access fee, research exclusivity fees and payments for research support related to our drug discovery efforts, primarily lead optimization. Conditioning program costs also increased due to our ongoing proof of mechanism non-human primate study. Expenses related to our expansion program increased primarily due to clinical trial costs incurred for our MGTA-456 Phase II study for inherited metabolic diseases, which we initiated in December 2017, and preparation for planned additional clinical trials in indications beyond inherited metabolic diseases. The increase in spending related to our GvHD program was due to costs related to our drug discovery efforts, primarily target validation.

The increase in personnel-related costs included in unallocated expenses was due to an increase in headcount in our research and development function. Personnel-related costs for the three months ended March 31, 2017 and

[Table of Contents](#)

2018 included stock-based compensation expense of \$0.1 million and \$0.2 million, respectively. The increase in consultant fees was primarily due to an increase in stock-based compensation from \$0.2 million for the three months ended March 31, 2017 to \$0.7 million for the three months ended March 31, 2018. The increase in facility related and other costs was primarily due to rent expense under our lease agreement for our Cambridge, Massachusetts facility, which we entered into in February 2017, as well as higher costs related to laboratory supplies and equipment.

General and Administrative Expenses

	Three Months Ended March 31,		Change
	2017	2018	
	(in thousands)		
Personnel related (including stock-based compensation)	\$ 570	\$1,814	\$1,244
Professional and consultant fees	676	1,149	473
Facility related and other	243	494	251
Total general and administrative expenses	<u>\$1,489</u>	<u>\$3,457</u>	<u>\$1,968</u>

The increase in personnel-related costs was primarily a result of an increase in headcount. Personnel-related costs for the three months ended March 31, 2017 and 2018 included stock-based compensation expense of \$0.1 million and \$0.5 million, respectively. The increase in professional and consultant fees was primarily due to an increase in legal and patent costs related to our ongoing business activities and preparations to operate as a public company. The increase in facility related and other costs was primarily due to higher facility and other costs related to our Cambridge, Massachusetts facility lease, which we entered into in February 2017, as well as our growth.

Other Income (Expense)

There was no interest and other income, net for the three months ended March 31, 2017. There was \$0.1 million interest and other income, net for the three months ended March 31, 2018 primarily related to interest income earned on our invested cash balances.

Comparison of the Years Ended December 31, 2016 and 2017

The following table summarizes our results of operations for the years ended December 31, 2016 and 2017:

	Year Ended December 31,		Change
	2016	2017	
	(in thousands)		
Revenue	\$ —	\$ —	\$ —
Operating expenses:			
Research and development	5,782	27,899	22,117
General and administrative	3,486	7,828	4,342
Total operating expenses	<u>9,268</u>	<u>35,727</u>	<u>26,459</u>
Loss from operations	<u>(9,268)</u>	<u>(35,727)</u>	<u>(26,459)</u>
Other income (expense):			
Interest expense	(163)	—	163
Interest and other income, net	—	236	236
Total other income (expense), net	<u>(163)</u>	<u>236</u>	<u>399</u>
Net loss	<u>\$ (9,431)</u>	<u>\$ (35,491)</u>	<u>\$ (26,060)</u>

Research and Development Expenses

	Year Ended December 31,		Change
	2016	2017	
	(in thousands)		
Direct external research and development expenses by program:			
Conditioning	\$ 303	\$ 6,259	\$ 5,956
Mobilization	431	1,416	985
Expansion	13	11,045	11,032
Unallocated expenses:			
Personnel related (including stock-based compensation)	1,527	4,384	2,857
Consultant fees	1,442	2,364	922
Facility related and other	2,066	2,431	365
Total research and development expenses	<u>\$5,782</u>	<u>\$27,899</u>	<u>\$22,117</u>

Expenses related to our conditioning program increased primarily as a result of our drug discovery efforts for target validation, lead identification and lead optimization. The increase in our mobilization program was due to an increase in preclinical costs for toxicology studies and manufacturing to support our Investigational New Drug, or IND, enabling studies. Expenses related to our expansion program increased primarily due to the cost of in-licensing technology of \$9.3 million for the rights to MGTA-456 under a license agreement with Novartis. The cost of in-licensing technology was a result of the issuance of preferred stock to Novartis which was recorded at the fair value of the preferred stock issued. Expansion program costs also increased due to clinical trial costs incurred in preparation for our MGTA-456 Phase II study for inherited metabolic diseases, which we initiated in December 2017.

The increase in personnel-related costs included in unallocated expenses was due to an increase in headcount in our research and development function. Personnel-related costs for the years ended December 31, 2016 and 2017 included stock-based compensation expense of \$0.1 million and \$0.3 million, respectively. The increase in consultant fees was primarily due to an increase in stock-based compensation from \$0.4 million for the year ended December 31, 2016 to \$1.3 million for the year ended December 31, 2017. The increase in facility-related and other costs included in unallocated expenses was primarily due to rent expense under our new lease agreement for our Cambridge, Massachusetts facility, which we entered into in February 2017.

General and Administrative Expenses

	Year Ended December 31,		Change
	2016	2017	
	(in thousands)		
Personnel related (including stock-based compensation)	\$1,205	\$3,369	\$2,164
Professional and consultant fees	1,942	3,217	1,275
Facility related and other	339	1,242	903
Total general and administrative expenses	<u>\$3,486</u>	<u>\$7,828</u>	<u>\$4,342</u>

The increase in personnel-related costs was primarily a result of an increase in headcount. Personnel-related costs for the years ended December 31, 2016 and 2017 included stock-based compensation expense of \$0.2 million and \$0.6 million, respectively. The increase in professional and consultant fees was primarily due to an increase in legal, audit and recruiting fees related to ongoing business activities and our preparations to operate as a public

[Table of Contents](#)

company as well as an increase of \$0.4 million related to market research activities. The increase in facility-related and other costs was primarily due to rent expense under our new lease agreement for our Cambridge, Massachusetts facility, which we entered into in February 2017.

Other Income (Expense)

Interest expense was \$0.2 million for the year ended December 31, 2016. There was no interest expense for the year ended December 31, 2017. The decrease of \$0.2 million in interest expense was due to the conversion of outstanding convertible notes into redeemable convertible preferred stock in November 2016.

There was no other income or expense for the year ended December 31, 2016. There was \$0.2 million other income, net for the year ended December 31, 2017 primarily related to interest income earned on our invested cash balances.

Liquidity and Capital Resources

Since our inception, we have incurred significant operating losses. We have not yet commercialized any of our product candidates and we do not expect to generate revenue from sales of any product candidates for several years, if at all. To date, we have funded our operations primarily with proceeds from the sales of redeemable convertible preferred stock and issuance of convertible notes. Through March 31, 2018, we had received net proceeds of \$82.7 million from sales of our redeemable convertible preferred stock (including proceeds from convertible notes, which converted into redeemable convertible preferred stock in November 2016). As of March 31, 2018, we had cash and cash equivalents of \$41.5 million. In April 2018, we received gross proceeds of \$52.3 million from the sale of Series C preferred stock.

Cash Flows

The following table summarizes our sources and uses of cash for each of the periods presented:

	Year Ended December 31,		Three Months Ended March 31,	
	2016	2017	2017	2018
	(in thousands)			
Cash used in operating activities	\$ (6,529)	\$ (22,263)	\$ (4,030)	\$ (9,604)
Cash used in investing activities	(169)	(2,334)	(731)	(161)
Cash provided by (used in) financing activities	10,711	71,486	6,214	(175)
Net increase (decrease) in cash and cash equivalents	<u>\$ 4,013</u>	<u>\$ 46,889</u>	<u>\$ 1,453</u>	<u>\$ (9,940)</u>

Operating Activities

During the three months ended March 31, 2018, operating activities used \$9.6 million of cash, primarily resulting from our net loss of \$11.2 million, partially offset by non-cash charges of \$1.6 million.

During the three months ended March 31, 2017, operating activities used \$4.0 million of cash, primarily resulting from our net loss of \$4.8 million, partially offset by non-cash charges of \$0.3 million and cash provided by changes in our operating assets and liabilities of \$0.4 million. Net cash provided by changes in our operating assets and liabilities for the three months ended March 31, 2017 consisted primarily of a \$0.5 million increase in accounts payable and accrued expenses partially offset by an increase of \$0.1 million in prepaid expenses and other current assets.

During the year ended December 31, 2017, operating activities used \$22.3 million of cash, primarily resulting from our net loss of \$35.5 million, partially offset by non-cash charges of \$11.9 million and cash provided by

[Table of Contents](#)

changes in our operating assets and liabilities of \$1.3 million. Net cash provided by changes in our operating assets and liabilities for the year ended December 31, 2017 consisted primarily of a \$2.2 million increase in accounts payable and accrued expenses, partially offset by an increase of \$0.9 million in prepaid expenses and other current assets.

During the year ended December 31, 2016, operating activities used \$6.5 million of cash, primarily resulting from our net loss of \$9.4 million, partially offset by non-cash charges of \$1.3 million and cash provided by changes in our operating assets and liabilities of \$1.6 million. Net cash provided by changes in our operating assets and liabilities for the year ended December 31, 2016 consisted primarily of a \$1.6 million increase in accounts payable and accrued expenses.

Changes in accounts payable, accrued expenses and prepaid expenses in both periods were generally due to growth in our business and the timing of vendor invoicing and payments.

Investing Activities

During the three months ended March 31, 2018 and 2017, we used \$0.2 million and \$0.6 million, respectively, to purchase property and equipment. During the three months ended March 31, 2017, we increased our restricted cash by \$0.2 million to secure a letter of credit related to a lease agreement.

During the years ended December 31, 2017 and 2016, we used \$2.2 million and \$0.1 million, respectively, to purchase property and equipment.

Financing Activities

During the three months ended March 31, 2018, net cash used by financing activities was \$0.2 million, consisting primarily of payments of initial public offering costs.

During the three months ended March 31, 2017, net cash provided by financing activities was \$6.2 million, consisting primarily of \$6.3 million of the remaining proceeds received in January 2017 from the sale of Series A redeemable convertible preferred stock that we recorded as other receivable as of December 31, 2016.

During the year ended December 31, 2017, net cash provided by financing activities was \$71.5 million, consisting primarily of \$6.3 million of the remaining proceeds received in January 2017 from the sale of Series A preferred stock that we recorded as other receivable as of December 31, 2016, \$15.4 million of proceeds from the sale of additional shares of Series A preferred stock and \$49.8 million of net proceeds received from the sale of Series B preferred stock.

During the year ended December 31, 2016, net cash provided by financing activities was \$10.7 million, consisting primarily of proceeds of \$6.5 million from the sale of convertible promissory notes and net proceeds of \$4.2 million from the sale of Series A preferred stock that we received in 2016.

Funding Requirements

We expect our expenses to increase substantially in connection with our ongoing activities, particularly as we advance the preclinical activities and clinical trials for our product candidates in development. In addition, upon the closing of this offering, we expect to incur additional costs associated with operating as a public company. The timing and amount of our operating expenditures will depend largely on:

- the initiation, progress, timing, costs and results of current and future preclinical studies and clinical trials for our product candidates;
- the clinical development plans we establish for these product candidates;

[Table of Contents](#)

- the number and characteristics of product candidates that we develop or may in-license;
- the terms of any collaboration agreements we may choose to conclude;
- the outcome, timing and cost of meeting and maintaining compliance with regulatory requirements established by the FDA, the EMA and other comparable foreign regulatory authorities;
- the cost of filing, prosecuting, defending and enforcing our patent claims and other intellectual property rights;
- the cost of defending intellectual property disputes, including patent infringement actions brought by third parties against us;
- the effect of existing or new competing technological and market developments;
- the cost and timing of completion of commercial-scale outsourced manufacturing activities; and
- the cost of establishing sales, marketing and distribution capabilities for any product candidates for which we may receive regulatory approval in regions where we choose to commercialize our products on our own.

As of March 31, 2018, we had cash and cash equivalents of \$41.5 million. In April 2018, we received gross proceeds of \$52.3 million from the sale of our Series C preferred stock. We believe that the net proceeds from this offering, together with our existing cash and cash equivalents, will enable us to fund our operating expenses and capital expenditure requirements through . We have based these estimates on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we expect. Because of the numerous risks and uncertainties associated with research, development and commercialization of pharmaceutical product candidates, we are unable to estimate the exact amount of our working capital requirements. Our future funding requirements will depend on and could increase significantly as a result of many factors, including those listed above.

Without giving effect to the anticipated net proceeds from this offering, we expect that our existing cash and cash equivalents of \$41.5 million as of March 31, 2018, together with the gross proceeds of \$52.3 million from the sale of Series C preferred stock in April 2018, will be sufficient to fund our operating expenses and capital expenditure requirements through 12 months from the issuance date of our financial statements.

Until such time, if ever, as we can generate substantial product revenue, we expect to finance our operations through a combination of equity financings, debt financings, collaborations with other companies or other strategic transactions. We do not currently have any committed external source of funds. To the extent that we raise additional capital through the sale of equity or convertible debt securities, your ownership interest will be diluted, and the terms of these securities may include liquidation or other preferences that adversely affect your rights as a common stockholder. Debt financing and preferred equity financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making acquisitions or capital expenditures or declaring dividends. If we raise additional funds through collaborations, strategic alliances or marketing, distribution or licensing arrangements with third parties, we may have to relinquish valuable rights to our technologies, future revenue streams, research programs or product candidates or grant licenses on terms that may not be favorable to us. If we are unable to raise additional funds through equity or debt financings or other arrangements when needed, we may be required to delay, limit, reduce or terminate our research, product development or future commercialization efforts or grant rights to develop and market product candidates that we would otherwise prefer to develop and market ourselves.

Contractual Obligations and Commitments

The following table summarizes our contractual obligations as of December 31, 2017 and the effects that such obligations are expected to have on our liquidity and cash flows in future periods:

	Payments Due By Period				
	Total	Less Than 1 Year	1 to 3 Years (in thousands)	4 to 5 Years	More Than 5 Years
Operating lease commitments ⁽¹⁾	\$612	\$ 612	\$ —	\$ —	\$ —
Total	\$612	\$ 612	\$ —	\$ —	\$ —

(1) Reflects payments due for our sublease of office and laboratory space in Cambridge, Massachusetts under an operating lease agreement that expires in August 2018.

We enter into contracts in the normal course of business with CROs, CMOs and other third parties for clinical trials, preclinical research studies and testing and manufacturing services. These contracts are cancelable by us upon prior written notice. Payments due upon cancellation consist only of payments for services provided or expenses incurred, including noncancelable obligations of our service providers, up to the date of cancellation. These payments are not included in the preceding table as the amount and timing of such payments are not known.

We have also entered into license and collaboration agreements with third parties, which are in the normal course of business. We have not included future payments under these agreements in the table of contractual obligations above since obligations under these agreements are contingent upon future events such as our achievement of specified development, regulatory, and commercial milestones, or royalties on net product sales. As of December 31, 2017, we were unable to estimate the timing or likelihood of achieving these milestones or generating future product sales.

Off-Balance Sheet Arrangements

We did not have during the periods presented, and we do not currently have, any off-balance sheet arrangements, as defined in the rules and regulations of the Securities and Exchange Commission.

Recently Issued and Adopted Accounting Pronouncements

A description of recently issued accounting pronouncements that may potentially impact our financial position and results of operations is disclosed in Note 2 to our financial statements appearing at the end of this prospectus.

Quantitative and Qualitative Disclosures about Market Risks

We are exposed to market risk related to changes in interest rates. Our primary exposure to market risk is interest rate sensitivity, which is affected by changes in the general level of U.S. interest rates, particularly because our cash equivalents are in the form of a money market fund, which is primarily invested in short-term U.S. Treasury obligations. However, because of the short-term nature of the investments in our portfolio, an immediate 10% change in market interest rates would not have a material impact on the fair market value of our investment portfolio or on our financial position or results of operations.

We are not currently exposed to significant market risk related to changes in foreign currency exchange rates; however, we have contracted with and may continue to contract with foreign vendors that are located in Europe. Our operations may be subject to fluctuations in foreign currency exchange rates in the future.

Inflation generally affects us by increasing our cost of labor. We do not believe that inflation had a material effect on our business, financial condition or results of operations during the years ended December 31, 2016 and 2017.

Emerging Growth Company Status

We are an “emerging growth company,” as defined in the Jumpstart Our Business Startups Act of 2012, or the JOBS Act. Under the JOBS Act, emerging growth companies can delay adopting new or revised accounting standards issued subsequent to the enactment of the JOBS Act until such time as those standards apply to private companies. We have elected not to “opt out” of such extended transition period, which means that when a standard is issued or revised and it has different application dates for public or private companies, we will adopt the new or revised standard at the time private companies adopt the new or revised standard and will do so until such time that we either (1) irrevocably elect to “opt out” of such extended transition period or (2) no longer qualify as an emerging growth company.

We are in the process of evaluating the benefits of relying on other exemptions and reduced reporting requirements under the JOBS Act. Subject to certain conditions, as an emerging growth company, we may rely on certain of these exemptions, including without limitation, providing an auditor’s attestation report on our system of internal controls over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act. We would cease to be an emerging growth company upon the earliest of: (1) the last day of the fiscal year ending after the fifth anniversary of our initial public offering; (2) the last day of the fiscal year in which we have more than \$1.07 billion in annual revenue; (3) the last day of the fiscal year in which we qualify as a “large accelerated filer,” with at least \$700.0 million of equity securities held by non-affiliates as of the prior June 30th; or (4) the issuance, in any three-year period, by our company of more than \$1.0 billion in non-convertible debt securities held by non-affiliates.

BUSINESS

Overview

For more than 50 years, doctors and patients have had difficult conversations about bone marrow transplant: the procedure can save patients' lives and cure them of disease, but the risk of toxicity and even mortality is often a significant deterrent. At Magenta, we believe we can refocus that conversation on the cure and enable many more patients with devastating diseases such as severe autoimmune diseases, including multiple sclerosis; blood cancers, including leukemia; and genetic diseases such as sickle cell disease to benefit from advances in transplant medicine.

We are a clinical-stage biotechnology company developing novel medicines to bring the curative power of bone marrow transplant to more patients.

Transplant is a well-established and often curative medical procedure, and emerging data on stem cell gene therapy, which is bone marrow transplant using gene-modified stem cells, suggest the potential for meaningful benefit with this newer form of transplant. Bone marrow transplant and stem cell gene therapies use the same widely-adopted decades-old transplant process. As it exists today, bone marrow transplant is a large market opportunity, and improvements to the current approaches could extend bone marrow transplant to more patients. The ability to treat patients with a bone marrow transplant is limited by the challenge of obtaining sufficient cells to perform the procedure, the inherent morbidity and mortality of current methods used to prepare patients for transplant, and complications following transplant.

At Magenta, we believe we are uniquely positioned to overcome these challenges and to lead a new era in transplant medicine. Our portfolio of product candidates includes biologics, small molecules and a cell therapy designed to address deficiencies in existing approaches and extend the curative power of bone marrow transplant to more patients across many diseases. Currently, only a fraction of eligible patients with these diseases receive a transplant because the risks and challenges outweigh the potential for a cure. These include diseases where bone marrow transplant is a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and autoimmune diseases. Emerging clinical data suggest that bone marrow transplant may represent a breakthrough approach with curative potential for patients with severe autoimmune diseases. For example, recent results from multiple clinical trials show that patients with autoimmune diseases, including multiple sclerosis and scleroderma, can be cured with a transplant. However, based on our epidemiology analyses, currently only approximately 1 to 2% of eligible patients with multiple sclerosis or scleroderma in the United States and Europe receive a bone marrow transplant.

To address the major unmet medical needs in the existing bone marrow transplant process, we are developing a stem cell biology discovery platform and comprehensive portfolio of novel therapeutics. Our programs will improve stem cell dose (expansion), stem cell collection (mobilization), patient preparation for transplant (conditioning) and potential post-transplant complications, to address key limitations of the bone marrow transplant process to allow more patients to benefit. Within our expansion program, MGTA-456, our most advanced clinical product candidate, is a cell therapy that has achieved clinical proof of concept in 36 patients with blood cancers and is now being studied in patients with fatal inherited metabolic diseases. MGTA-456 is an expanded cord blood product, and has the potential to allow more patients to have a better chance for a successful stem cell transplant. Within our mobilization program, MGTA-145 is focused on enabling physicians to more easily harvest a greater number of blood stem cells, known as hematopoietic stem cells or HSCs, from patients and donors to improve patient outcomes. Our targeted transplant conditioning programs, which prepare the patient for transplant, are designed to selectively remove stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the decades-old radiation and chemotherapy-based approaches which are still the only available options. Our post-transplant complications program is designed to target the donor immune cells within the patient that cause Graft vs. Host Disease, or GvHD, which can be a fatal complication of transplant.

We intend to become a fully integrated discovery, development and commercial company in the field of transplant medicine. We believe that our product portfolio will offer significant commercial synergies. We are developing our products so that they can each be used individually or in combination with each other. As a result, our portfolio could be utilized in a manner tailored to the patient's disease, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey.

Our goal is to have three clinical programs moving forward in multiple indications by 2020, with a rapidly advancing portfolio and sustainable platform.

Background on Bone Marrow Transplant

Bone marrow is the tissue inside the bones where HSCs are located. HSCs produce all of the cells in the blood and immune systems, including: T cells and B cells to fight infections; red blood cells to carry oxygen; and platelets to control bleeding. The bone marrow is highly active, and gives rise to billions of new cells every day. However, abnormal functioning of the system can lead to serious and sometimes fatal blood and immune diseases. The aim of bone marrow transplant, also called HSC transplant or stem cell transplant, is to replace the diseased blood and immune cells with new stem cells that will produce new blood and immune cells, thereby effectively resetting the blood and immune systems to a healthy state. Bone marrow transplant is a well-established procedure with curative intent, rooted in decades of clinical experience.

Starting from the first procedure in 1956, more than 1 million patients with blood cancers and genetic diseases worldwide have undergone a bone marrow transplant, and currently approximately 65,000 patients undergo the procedure annually. Bone marrow transplant serves as the standard of care in many blood cancers, such as leukemias, lymphomas and multiple myeloma; and for rare genetic diseases such as Hurler's syndrome and is the only curative option for sickle cell disease.

However, bone marrow transplant is a complex procedure that carries significant risks, including serious complications such as infection, secondary cancers and even patient death. A majority of patients who could significantly benefit from or be cured by a transplant do not receive one primarily because of the toxicity and risks associated with the procedure. For example, primarily because of these risks, approximately two out of three eligible patients suffering from acute myeloid leukemia do not receive a transplant despite it being the standard of care. For debilitating but non-life-threatening diseases, such as sickle cell disease and multiple sclerosis, even fewer patients are offered and receive a transplant because the risks of the current transplant procedure often outweigh the potential benefits. There is a clear need to improve the safety and efficacy of transplant so that we can refocus the patient and physician conversation and bring the curative power of transplant to more patients.

Bone Marrow Transplant: The Process and Challenges

A bone marrow transplant procedure utilizes a number of integrated steps, which we highlight below: stem cell sourcing and collection, patient conditioning and stem cell infusion and engraftment. All transplants are categorized as either autologous or allogeneic, depending on the source of cells for the transplant. In an autologous transplant, used for conditions such as multiple myeloma, non-Hodgkin's lymphoma and autoimmune diseases, the patient's own stem cells are used. This is also the case for stem cell gene therapy. In an allogeneic transplant, used for conditions such as acute leukemia and genetic diseases, patients receive cells from a stem cell donor or umbilical cord blood.

Step 1: Stem Cell Sourcing and Collection

Once the patient and physician agree that bone marrow transplant is the best treatment option, first the source of stem cells must be identified and then the cells are collected. There are three sources of stem cells for transplant:

- extraction from the bone marrow, which requires a procedure performed under general anesthesia where cells are withdrawn directly from the bone marrow with needle aspirates;

[Table of Contents](#)

- mobilization into the peripheral blood, which requires several days of injections of a drug or combination of drugs to mobilize the cells, or move them from the bone marrow into the bloodstream, where they are then collected through a process called apheresis; and
- harvesting from umbilical cord blood units, which are stored in cord blood banks.

In the case of stem cell gene therapy, once the cells are collected from the patient, they are then modified to either insert a functioning gene or correct a defective gene.

Challenges

Finding a matched donor: For patients requiring an allogeneic transplant, the preferred source of stem cells is a donor from their family who has a well-matched immune system. For patients without a matched, related donor, the second option is a matched, unrelated donor identified through the bone marrow donor registry. Although there are more than 25 million registered bone marrow donors worldwide, nearly half of all patients are unable to find a matched donor. For patients without a matched donor, other options include mismatched donors, who can either be unrelated or related; however, transplant outcomes are not optimal with these donor types. For patients without a matched, related donor, umbilical cord blood also provides a potential source of stem cells. However, despite the utility of this approach, there are significant challenges with umbilical cord blood transplant. Even when patients find matched cord blood units, transplants are severely limited because there are often too few stem cells in the cord blood unit. Although more than 712,000 units are available in the worldwide cord blood inventory, current cell dose requirements mean that fewer than approximately 4% of these units contain enough stem cells for use in adult patients. Because so few units are suitable for use in adult patients, the patient is less likely to find a closely matched cord blood unit, leading to less than optimal transplant outcomes.

Stem cell collection: It is critical that physicians obtain enough stem cells for the transplant, whether from a patient or a donor, as higher cell doses are closely correlated to better patient outcomes. In some cases, multiple invasive bone marrow harvests are needed to obtain an adequate number of stem cells. The autologous transplant field has moved away from bone marrow harvest to stem cell mobilization in recent years due to the difficulty of the procedure for both patients and physicians. In the case of stem cell mobilization, current treatments involve repeated injections and are often associated with bone pain, nausea, headache, and fatigue. Another challenge associated with current mobilization approaches is the difficulty of predicting whether mobilization will be successful, especially in heavily treated blood cancer patients. In fact, most patients require multiple days of apheresis and some patients require more than one mobilization procedure to obtain a sufficient number of cells for transplant. Additionally, mobilization failure rates for autologous transplants are as high as 40%. Given that mobilized peripheral blood is the predominant source of stem cells for transplant, there is a need for better HSC mobilization agents.

Step 2: Conditioning

Once sufficient cells have been obtained, the patient is then conditioned for transplant using systemic, toxic chemotherapy and/or radiation. Depending on the disease and type of transplant, the conditioning treatment is intended to remove or deplete:

- existing stem cells in the bone marrow to provide space for the incoming stem cells;
- immune cells (T cells and B cells) to prevent rejection of the incoming cells or remove disease-causing autoimmune cells; and/or
- cancer cells to prevent disease relapse in patients with blood cancers.

Challenges

Conditioning toxicity: Bone marrow transplant conditioning is very burdensome and risky for both pediatric and adult patients. Conditioning treatments today are typically non-targeted and involve systemic, toxic

chemotherapy and/or radiation. Most of these genotoxic chemotherapy agents, including derivatives of mustard gas, were discovered more than 50 years ago, and were never intended for bone marrow transplant conditioning. The current treatments eradicate the stem and immune cells and diseased cells but also indiscriminately damage DNA and kill normal, healthy cells in the body, which can lead to severe infections, organ failure, infertility, secondary cancers and even death. Nearly all transplant patients experience complications as a result of current conditioning treatments, and conditioning toxicity is responsible for up to 35% of mortality following allogeneic transplants. The side effects and mortality risk of conditioning are among the major barriers preventing bone marrow transplants from being performed more widely in other diseases where they may be curative. Efforts to reduce chemotherapy doses have met with some success, but the most commonly used conditioning regimens all involve the use of genotoxic agents.

Step 3: Stem Cell Infusion and Engraftment

Once conditioning is complete, the stem cells are infused into the patient via the bloodstream. The cells travel to the bone marrow and engraft there, meaning they lodge in the bone marrow and begin to make new blood and immune cells. Once the bone marrow has made enough blood cells – particularly white blood cells to fight infection – which typically takes several weeks, the patient can be discharged from the hospital. There are instances where the stem cells do not engraft or are rejected by the patient’s body, leading to prolonged hospitalization and the need for an additional transplant. Outcomes of additional transplants are typically very poor.

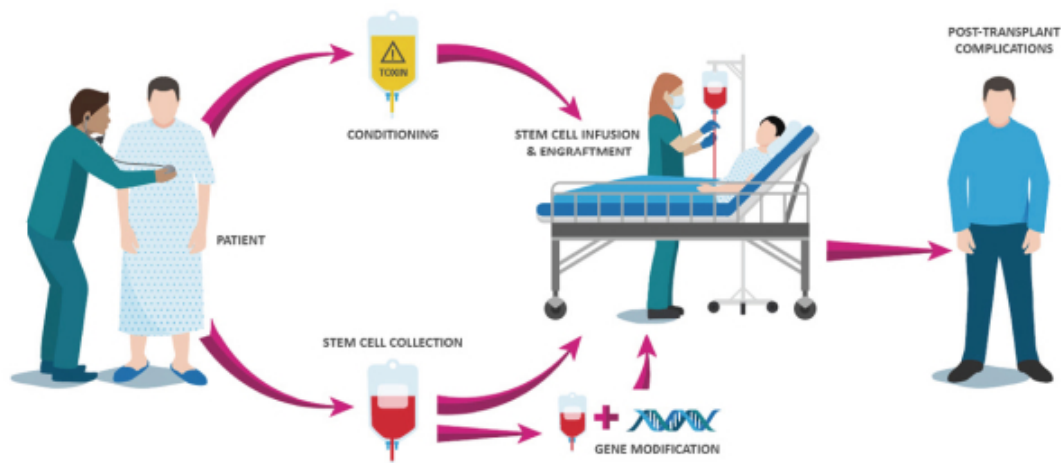
Challenges

Transplant rejection: A major complication of stem cell transplant is when the infused stem cells are rejected by the patient’s body. Rejection is a particular problem where stem cell doses are low, for example with cord blood transplants.

Delayed engraftment: Depending on the dose of stem cells infused, engraftment can take between two to six weeks. During this period, patients are required to be in specialized isolation rooms at the hospital and are susceptible to infections.

Graft vs. Host Disease: GvHD is a reaction that commonly develops after an allogeneic bone marrow transplant and is a result of the donor immune cells recognizing the patient’s cells as foreign and attacking them. Acute GvHD typically occurs within weeks of a patient receiving a bone marrow transplant and can severely damage the skin, liver, and gastrointestinal system. GvHD accounts for approximately 10% of deaths following allogeneic transplant.

Transplant Patient Journey



Our Solutions

We are applying our expertise in stem cell biology and biotherapeutics discovery to bring innovative, modern medicines to the transplant field through our programs, specifically designed to address each of the key challenges of the bone marrow transplant journey for patients:

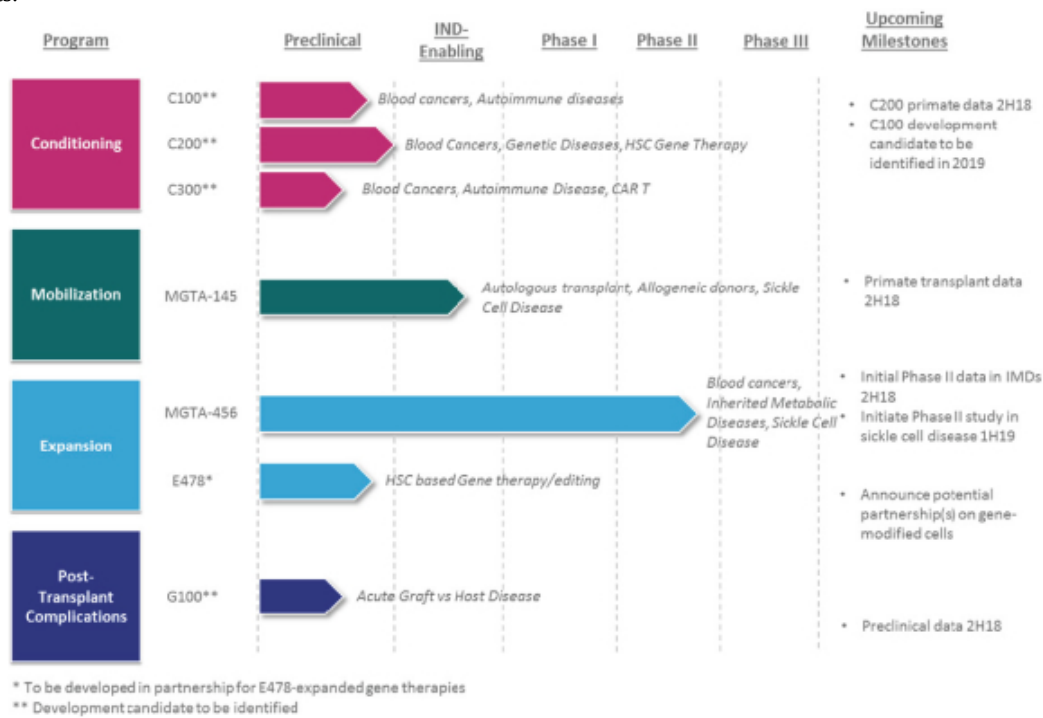
- ***Stem cell source and engraftment challenges (expansion programs)***: Our stem cell expansion programs are focused on generating higher cell doses, which have been shown to improve the speed and success of engraftment in bone marrow transplant. Through the cord blood expansion process, our MGTA-456 product candidate also has the potential to allow more patients to access better matched cord blood units that were previously not available due to low cell dose. Our AHR antagonist, E478, uses the same mechanism applied to make MGTA-456 to expand gene-modified HSCs for gene therapy and genome editing.
- ***Stem cell mobilization (mobilization program)***: Our stem cell mobilization program is focused on enabling physicians to more easily collect larger numbers of high-quality HSCs from patients and donors to yield higher cell doses for transplant.
- ***Conditioning toxicity (targeted conditioning programs)***: Our targeted transplant conditioning programs are designed to selectively eliminate stem and/or immune cells from a patient prior to transplant, and to be far less toxic than the current radiation and chemotherapy-based treatments. These programs focus on developing targeted products that deplete specific cell types, with an approach that is tailored to the patient's disease and designed to be less toxic than the current chemotherapy-based treatments.
- ***GvHD (post-transplant complications program)***: Our post-transplant program is designed to target the donor immune cells within the patient that cause GvHD, potentially reducing the occurrence of GvHD without sacrificing the benefits of an allogeneic transplant, broadening access to the curative potential of transplant.

Our Current Program Pipeline

We are developing a pipeline of small molecules; biologics, including antibody drug conjugates; and a cell therapy, which we believe can meaningfully improve and expand curative bone marrow transplant options for many more patients with autoimmune diseases, blood cancers and genetic diseases. Our portfolio of novel

[Table of Contents](#)

medicines for transplant has the potential to allow more patients with debilitating or life-threatening diseases to access a one-time, transformative bone marrow transplant with better outcomes, less toxicity risk and less mortality risk. We are developing our product candidates so that they can each be used individually or in combination with each other, such that a patient may receive more than one Magenta therapy as part of their individual transplant journey. In addition to our first set of clinical and preclinical product candidates, we are in the process of identifying several other potential candidates from our discovery programs as shown in the below chart. Our goal is to have three distinct clinical programs in multiple indications by 2020 with a series of data read-outs.



C100, C200, C300: targeted antibody-drug conjugates for conditioning

We are developing a suite of novel antibody-drug conjugates, or ADCs, for transplant conditioning, a step in the transplant process that is still dominated by the use of systemic chemotherapy agents and radiation. We are seeking to replace these non-targeted toxic conditioning agents with targeted ADCs. These drugs are designed for transplant and specifically deplete only the cell types required to be eliminated in order to perform a successful transplant. Certain ADCs are currently used to treat cancer by directing a toxin to specific cells using antibodies. Our programs are adapting this clinically validated modality for conditioning patients for bone marrow transplant.

Table of Contents

All of our conditioning programs share an ADC platform but differ in the targeted cell types. The C100 program targets HSCs, immune cells, and disease-causing cells, the C200 program targets HSCs and disease-causing cells and the C300 program targets only immune cells. This is achieved by tuning the antibodies to specific cellular markers or receptors that are expressed on the particular cell types.

	C100	C200	C300
Lead target	CD45	CD117	Undisclosed
Cells removed	Stem and immune cells Disease-causing cells	Stem cells Disease-causing cells	Immune cells
Diseases	Autoimmune diseases Blood cancers	Genetic diseases Genetic diseases (gene therapy) Blood cancers	Autoimmune diseases Blood cancers Blood cancers (CAR T)

Our most advanced conditioning program, C200, is designed to specifically deplete HSCs and disease-causing cells. Our lead ADC product candidate targets CD117, also known as c-Kit, which is highly expressed on HSCs and leukemia cells, making it an ideal target for conditioning across broad sets of diseases. This includes blood cancers as well as hemoglobinopathies like sickle cell disease and beta-thalassemia, with potential applicability in both bone marrow transplant and stem cell gene therapy. At the American Society of Hematology, or ASH, annual meeting in December 2017, we presented data showing that a single dose of CD117-ADC depleted more than 90% of human HSCs in the bone marrow of humanized NSG (immunodeficient) mice and was well tolerated over the entire 21-day study. Preliminary data suggest that a single dose of CD117-ADC is also effective at significantly reducing tumor burden and conferring survival benefits in mice challenged with CD117-expressing acute myelogenous leukemia cells. Our antibodies are designed to also recognize the target antigen in non-human primates, which gives us the opportunity to evaluate efficacy and safety in non-human primates prior to conducting human clinical trials. We are currently studying CD117-ADC in non-human primates and expect to submit primate proof of concept data for presentation at a medical meeting in late 2018.

The second conditioning program in our portfolio is C100, under which we are developing ADCs that specifically deplete host HSCs and immune cells. Within our C100 program, our lead target is CD45, an important cell surface molecule broadly expressed throughout the hematopoietic and immune systems. We are currently in the lead identification stage for this program and intend to declare a development candidate in 2019. We plan to develop C100 for use in patients with CD45-expressing leukemias and lymphomas, followed by patients with autoimmune diseases such as multiple sclerosis and scleroderma.

Our third ADC-based conditioning program, C300, targets T cells, a type of immune cell. T cell depletion is currently performed with highly toxic, non-specific drugs which can lead to immune deficiency, infections and other complications including secondary autoimmune reactions. We are pursuing targets expressed on the surfaces of T cells with the goal of offering a safer and more optimized targeted conditioning approach through T cell depletion before CAR T therapy for blood cancers, prevention of stem cell rejection prior to allogeneic bone marrow transplant or achievement of immune system reset before autologous bone marrow transplant in autoimmune disease patients.

MGTA-145: CXCR2 agonist combined with plerixafor for HSC mobilization

MGTA-145 is a novel stem cell mobilization product candidate that was developed based on our understanding of the physiological mechanisms that control stem cell mobilization. The goal of MGTA-145 is to achieve high levels of stem cell mobilization in patients and donors in order to replace the current standard of care, a drug known as granulocyte colony-stimulating factor, or G-CSF. G-CSF is a glycoprotein that mobilizes stem cells indirectly and comes with limitations that include a prolonged treatment period of up to one week of injections, lack of efficacy in some patients, and significant bone pain. MGTA-145 is a CXCR2 agonist protein that activates neutrophils to release proteases that cause the release of HSCs into the blood. This novel mechanism of

action is complementary to that of plerixafor, another commonly used mobilization agent marketed by Sanofi. Plerixafor acts as a small molecule CXCR4 antagonist, blocking a pathway that otherwise plays an essential role in attracting and retaining HSCs in the bone marrow. The combination of MGTA-145 and plerixafor leads to a synergistic, robust and rapid stem cell mobilization, which was highlighted in recent data we presented at the ASH annual meeting in December 2017. Based on these results, we have initiated IND-enabling studies of MGTA-145 in combination with plerixafor and expect to file an Investigational New Drug Application, or IND, with the U.S. Food and Drug Administration, or FDA, for this product candidate in 2019. We plan to develop MGTA-145 for mobilization first in patients with multiple myeloma and non-Hodgkin lymphoma, followed by healthy donors for allogeneic transplant. We plan to further investigate MGTA-145 in patient populations where G-CSF can exacerbate the disease, such as autoimmune diseases, and patient populations where G-CSF is contra-indicated, such as sickle cell disease.

MGTA-456: aryl hydrocarbon receptor (AHR) antagonist expanded stem cells

Our most advanced product candidate, MGTA-456, is a novel proprietary allogeneic stem cell therapy that was developed based on our understanding of the mechanisms that control stem cell growth. The goal of MGTA-456 is to extend the use of cord blood transplant to more patients by generating a higher stem cell dose. This is done by expanding a single umbilical cord blood unit *ex vivo* with a small molecule AHR antagonist. AHR antagonism is a novel, well-studied and clinically validated pathway that controls the self-renewal and differentiation of human HSCs. We have applied this technology to increase the number of HSCs present in an umbilical cord blood unit to extend the use of umbilical cord blood as a stem cell source for transplant. In addition, MGTA-456 also has the potential to improve overall survival by allowing more patients to have access to better matched cord blood units, which is associated with better outcomes and lower rates of post-transplant complications.

MGTA-456 has achieved human proof-of-concept in a Phase I/II study in patients with blood cancers. Data from the study showed that the median expansion of stem cells from the original cord blood unit was 330-fold, and all 36 patients treated with MGTA-456 in the study successfully achieved engraftment of these expanded stem cells. The rapid and robust engraftment of MGTA-456 in patients with blood cancers suggests that MGTA-456 may also improve engraftment in other patients in whom engraftment failure is a potential problem. For example, a group of diseases where cord blood transplant is increasingly used is inherited metabolic diseases, which typically affect infants and young children. Although transplant can be curative in these diseases, between approximately 20 to 30% of patients with inherited metabolic diseases treated with transplant experience engraftment failure, resulting in severe complications, including death. We believe the high number of HSCs present in MGTA-456 should speed engraftment, reduce or eliminate engraftment failure and improve patient outcomes.

We have initiated a Phase II study of MGTA-456 in patients with inherited metabolic diseases and intend to explore other debilitating diseases where we believe MGTA-456 could bring transformative benefit to patients. We expect to report initial data from our Phase II study in late 2018. If the results from this trial are favorable, we plan to initiate a Phase III trial in 2019. We also intend to initiate a Phase II study of MGTA-456 in patients with sickle cell disease in early 2019. On April 11, 2018, we received orphan drug designation from the FDA for MGTA-456 for the enhancement of cell engraftment in patients receiving bone marrow transplant.

We are the sponsor of the IND for MGTA-456 in inherited metabolic diseases. The IND was originally filed by Novartis International Pharmaceutical Ltd., or Novartis, on November 6, 2015 and formally transferred to us on July 25, 2017. The IND is active and up to date with reporting requirements, such as annual reports.

We obtained the rights to MGTA-456 through an April 2017 license agreement with Novartis granting us the sole worldwide rights to research, develop and commercialize certain AHR antagonist compounds specifically for the expansion of cord blood-derived non-gene-edited/-modified HSCs. See “Licenses and Collaborations” section.

E478: AHR antagonist for expansion of gene-modified stem cells

E478 is a novel and proprietary small molecule AHR antagonist that was developed to increase the number of gene-modified HSCs *ex vivo* for stem cell based-gene therapy. Gene therapy, or bone marrow transplant with gene-modified or genome-edited cells, is a promising treatment approach for several diseases. However, this approach is significantly limited by the inability to generate a sufficient dose of gene-modified HSCs that retain the ability to engraft in patients as well as the cost and complexity of manufacturing viral vectors for gene modification of cells. These constraints could limit the commercial viability of this approach. E478 uses the same clinically validated mechanism as MGTA-456 to expand gene-modified HSCs. In addition to addressing cell dose limitations, the ability to expand long-term repopulating HSCs *ex vivo* has the potential to reduce manufacturing costs for these therapies by requiring less viral vector for gene modification of the stem cells. At the ASH annual meeting in December 2017, we presented data showing that culturing gene-modified human HSCs with E478 increased the number of gene-modified stem cells that retained engraftment ability in preclinical models. We are developing E478 specifically to partner with gene therapy and genome editing companies. E478 would be integrated into our potential partners' cell-based products leading to a newly defined cell therapy.

G100: ADC program for prevention of acute GvHD

We are developing a unique approach to preventing acute GvHD, a major complication and a leading cause of death in allogeneic transplantation. GvHD occurs when alloreactive T cells in the donor stem cell graft recognize the patient as foreign and attack their tissues. Current treatments for acute GvHD prevention include the prophylactic use of non-specific immune suppressive agents. The use of high doses of non-specific immune suppressive agents for GvHD treatment is correlated with an increased risk of infection and poor immune function, and despite the use of these powerful immune suppressive agents, approximately 50 to 80% of allogeneic transplant patients will experience acute GvHD. Our G100 program is designed to selectively eliminate only the components of the graft that cause acute GvHD, specifically the alloreactive T cells. This ADC therapy is intended to be dosed *in vivo* at the time of transplant. By specifically targeting the alloreactive T cells that arise shortly after transplant, this therapy should spare the remainder of the patient's immune system to allow immune recovery and protection from infections.

Our Strategy

Our mission and our culture are centered around the goal of enabling more patients with severe or life-threatening diseases to have access to the transformative benefit of a bone marrow transplant. We intend to provide physicians with a tailored, multi-product treatment regimen based on the disease setting and the individual needs of each patient. Our strategic priorities are as follows:

Bring the curative power of bone marrow transplant to all patients who can benefit by advancing an integrated product portfolio: We believe we are the only company that is committed to addressing the major limitations and challenges of bone marrow transplant to revolutionize this entire field of medicine. Our product engine is generating a comprehensive portfolio of therapies to optimize the bone marrow transplant process. Our initial focus is on inherited genetic diseases, blood cancers and autoimmune diseases, and we also plan to address other diseases for which transplant could represent a one-time, curative treatment.

Build on our deep expertise in stem cell biology to lead a new era in transplant medicine: We have assembled a group of world leaders and pioneers in the fields of stem cell biology, biotherapeutics and transplant medicine. With this team, we are converting recent scientific breakthroughs into a product engine for bone marrow transplant therapies.

Create a fully integrated patient-focused biotechnology company: We are building a fully integrated biotechnology company with end-to-end capabilities in research, development and commercialization, and we believe the broad and synergistic nature of our portfolio will allow us to address many of the significant limitations of bone marrow transplant.

Commercialize our therapeutics to bring tailored transplant solutions to physicians and patients: We are developing our portfolio of products so that they can be used individually or in combination with each other, such that a patient may receive more than one Magenta therapy as part of their individual patient journey. Our commercial model centers around hospital-based prescribers, and this is consistent across all of the products in our portfolio. Bone marrow transplants are performed in a few hundred accredited medical centers in the U.S. and Europe, with more than half of the U.S. procedures performed at the top 20% of transplant centers. We believe the synergies among our programs and the well-defined structure of the current bone marrow transplant provider network will allow us to commercialize all of our own therapeutics in the U.S. and Europe through a focused, targeted commercial organization.

Leverage our most advanced product candidate, MGTA-456, as a clinical catalyst and commercial beachhead for our portfolio: We obtained the rights to MGTA-456, a clinical program currently in Phase II studies, through an April 2017 license agreement with Novartis. In addition to its potential to bring meaningful clinical benefit to patients, MGTA-456 provides strategic value to Magenta by allowing us to accelerate the build-out of our clinical development infrastructure and footprint and to establish key customer relationships that will be important for future commercialization of our products.

Continue to integrate our innovative collaboration with Be The Match with our science, medicine and business approaches: Be The Match is a leading patient-focused bone marrow transplant organization in the U.S. Because of our shared patient focus, we and Be The Match have established a broad, first-of-its-kind collaboration. This collaboration positions us as a partner with high-priority access to many services that will continue to enable us to establish relationships across transplant centers and with key transplant physicians. Through our partnership, we access clinical strategy support; clinical development operational support, including a unique cell supply platform that is very well established at Be The Match and which will also enable our commercialization efforts across several programs. We also have access to the Be The Match payer and policy group to support our pricing and reimbursement plans across the portfolio.

Strategically collaborate to realize the full potential of our portfolio: We currently retain 100% of the commercial rights for our products. We will evaluate additional collaborations to:

- maximize the patient impact of our portfolio by partnering to enable cell therapies, including stem cell-based gene therapies, genome editing and CAR T therapy;
- build relationships with partners to access complementary expertise and capabilities to bring our therapies as quickly as possible to all patients who can benefit; and
- opportunistically bring in preclinical or clinical assets that fit with our integrated portfolio.

[Table of Contents](#)








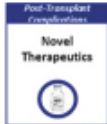
The chart below illustrates the synergistic nature of our portfolio of products, with examples of how our products could be used in combination to create disease-tailored solutions for patients.



Modular Products – Each Transplant Patient May Receive One or Multiple

<p style="text-align: center;">Acute Myelogenous Leukemia Patient <i>Allogeneic Transplant</i></p> <p style="text-align: center;">145 C200 G100 C300</p> <p><i>Each transplant uses 1 or more of:</i></p> <ul style="list-style-type: none"> • Donor mobilization • Pre-transplant HSC depletion • Pre-transplant T cell depletion • Post-transplant GvHD prevention 	<p style="text-align: center;">Multiple Sclerosis Patient <i>Autologous Transplant</i></p> <p style="text-align: center;">145 or 145 C100 C200 C300</p> <p><i>Each transplant uses 1 or more of:</i></p> <ul style="list-style-type: none"> • Patient mobilization • Pre-transplant HSC & T/B depletion; <ul style="list-style-type: none"> • Either via single agent ADC • Or via two ADCs 	<p style="text-align: center;">Inherited Metabolic Disease Patient <i>Cord Blood Transplant</i></p> <p style="text-align: center;">456 C200 G100 C300</p> <p><i>Each transplant uses 1 or more of:</i></p> <ul style="list-style-type: none"> • Cord blood expansion • Pre-transplant HSC depletion • Pre-transplant T cell depletion • Post-transplant GvHD prevention 	<p style="text-align: center;">Sickle Cell Disease Patient <i>Autologous Gene Therapy</i></p> <p style="text-align: center;">145 E478 C200</p> <p><i>Each transplant uses 1 or more of:</i></p> <ul style="list-style-type: none"> • Patient mobilization • Gene-modified stem cell expansion • Pre-transplant HSC depletion
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Our Current Programs

		Unmet Needs	Magenta Program	Magenta Value Proposition
Patient Conditioning		Genotoxic patient conditioning with significant side effects		Minimize transplant-related mortality and morbidities Reduce toxicity Reduce relapse rates
Stem Cell Collection		Non-robust stem cell mobilization with side-effects		Safely mobilize without severe side effects Same-day dosing and apheresis to maximize operations efficiency
Stem Cell Source		Low stem cell engraftment and poor outcomes Limited access to well matched grafts		Minimal graft rejection Faster time to engraftment and immune reconstitution Broadens access to transplant with well matched cord blood cells
Post-Transplant Complications		High risk of Graft vs. Host disease		Prevent acute GvHD

Conditioning Programs

Unmet need

For patients undergoing bone marrow transplant, the toxicity and mortality associated with current conditioning protocols are significant challenges and prevent more patients from benefitting from a life-saving and potentially curative transplant procedure. In many diseases, physicians have needed to use the most aggressive conditioning regimens to generate the best efficacy outcomes for transplant.

Conditioning treatments today are typically non-targeted and involve high doses of radiation and/or toxic chemotherapy. These chemotherapy agents, including derivatives of mustard gas, were discovered more than 50 years ago and were never intended for bone marrow transplant conditioning. The current treatments eradicate the stem and immune cells and diseased cells but also indiscriminately damage the DNA and kill normal, healthy cells in the body. These conditioning regimens can cause nausea and vomiting, mucositis, alopecia, acute and long term lung injury and liver toxicity, serious infections, organ failure, secondary cancers and even death. Nearly all transplant patients experience complications as a result of current conditioning treatments, and conditioning toxicity is responsible for up to 35% of mortality following allogeneic transplants.

Emerging clinical data have shown that we are now at a stage where autoimmune disease can be cured with a transplant, with recent data in multiple sclerosis and scleroderma. However, the toxicity of the required conditioning regimens has historically led many physicians to conclude that the risks of transplant in these patient populations far outweigh the benefits. A pair of comprehensive reviews published in 2017 in *Nature* journals summarized the clinical transplant results in multiple sclerosis and broader rheumatic autoimmune diseases. The main conclusions from this combined experience in over 3000 patients during the past 20 years were that the therapeutic benefit of stem cell transplant is significant across multiple studies in severe autoimmune diseases: Relapsing remitting multiple sclerosis, or RRMS, (five Phase II trials) and systemic sclerosis (two Phase II trials and two randomized trials) have the most clinical evidence using stringent disease

endpoints. When compared to the standard of care in RRMS, certain studies have shown that the proportion of patients with clinical benefit at two years appears to be double that of the next best treatment. Another study showed complete long-term suppression of all inflammatory activity in a cohort of patients with active and progressing multiple sclerosis who received a bone marrow transplant. Given bone marrow transplant's ability to durably eliminate relapses and disease activity in multiple sclerosis patients, we believe a safer transplant procedure would be a viable option for those patients with highly active disease beyond what therapeutics can manage. However, currently only approximately 1 to 2% of eligible patients with multiple sclerosis and scleroderma in the U.S. and Europe receive a bone marrow transplant primarily because the risk of the procedure outweighs the benefits of a potential cure. We believe we can significantly expand the number of autoimmune patients who can benefit from transplant.

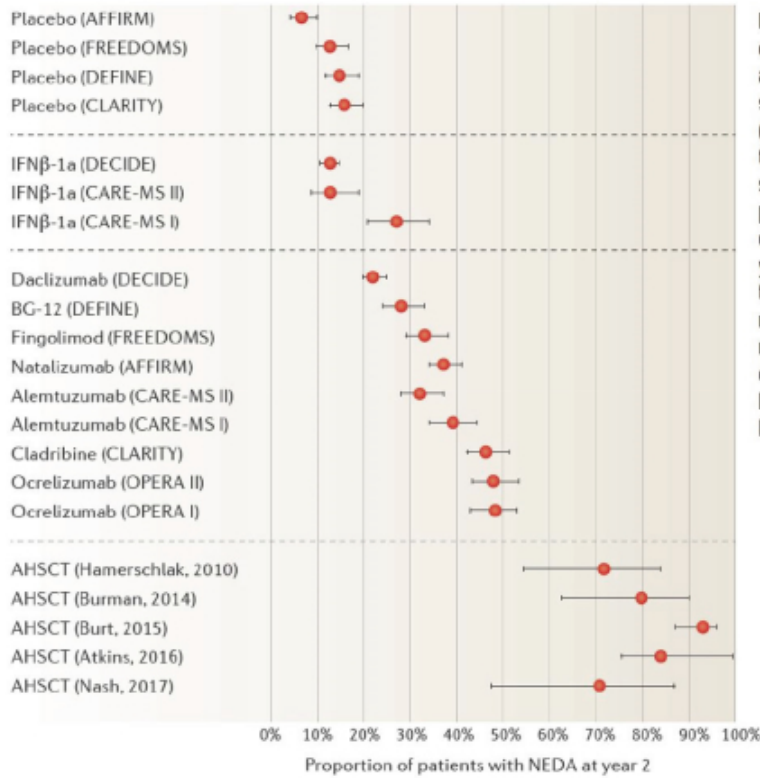
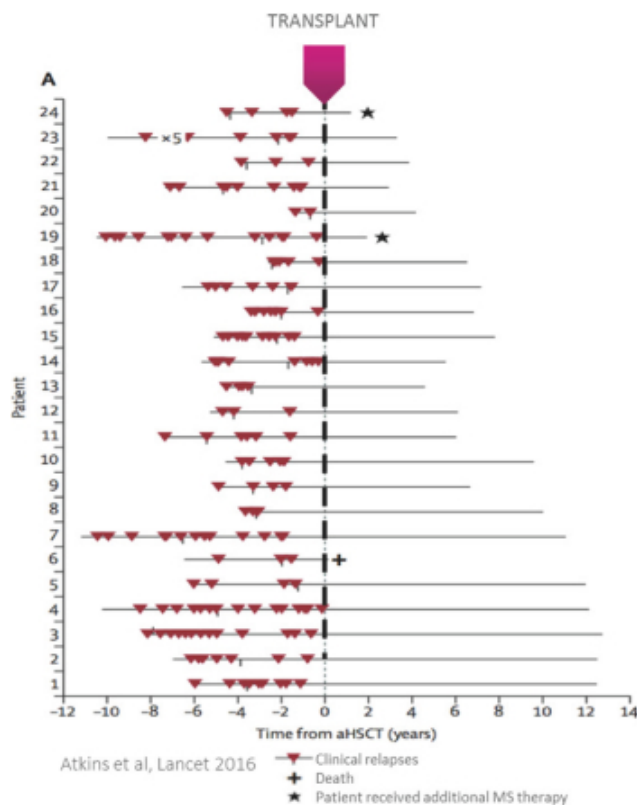


Figure 1: Durability of clinical benefit of autologous hematopoietic stem cell transplant (AHSCT) compared to other therapies for multiple sclerosis. The proportion of patients with no evidence of disease activity (NEDA) at 2 years during published clinical trials of AHSCT and disease-modifying drugs is shown by mean values with 95% confidence intervals (from Muraro et al, Nature Reviews Neurology, 2017).

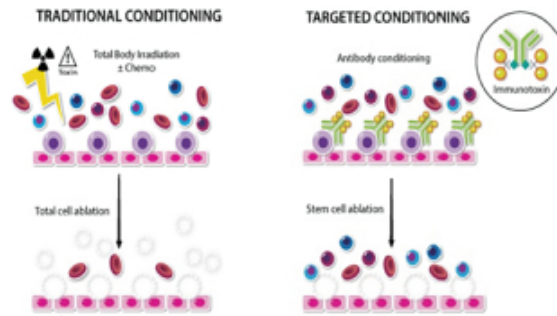


Timeline of clinical relapses. Each line represents a patient treated in the study. The lines continue until the latest follow-up assessment, death (cross), or censoring because the patient received a conventional, experimental, or unproven treatment (star). The lines begin at diagnosis of multiple sclerosis, inverted triangles denote a clinical relapse.

Our solution

We are developing a suite of novel ADCs for transplant conditioning. We are seeking to replace the current non-targeted toxic conditioning agents with targeted ADCs designed for transplant that specifically deplete only the cell types required to be eliminated in order to perform a successful transplant. While ADCs are an established treatment for certain cancers, we believe this is the first time that ADC technology has been harnessed for transplant medicine. These programs have the potential to expand the curative power of transplant beyond the eligible patient populations to patients who cannot tolerate current conditioning regimens, and to patients with autoimmune diseases, such as multiple sclerosis, where the current risk-benefit of transplant is not considered favorable due to the toxicity of the existing conditioning regimens.

ADCs are a technology developed over the past 20 years where a monoclonal antibody specific for a cell surface protein is coupled to a drug. The ADC binds the receptor on the target cell, is internalized and degraded to release the drug into the target cell. Coupling the drug to the antibody increases the specificity of drug delivery to the target cell, reducing systemic exposure and increasing the safety and efficacy compared to delivering the drug alone or the antibody without the drug attached. Today most ADCs are directed toward treating cancer cells expressing specific target receptors enriched on tumor cells. Our programs build on this clinically validated modality and adapt it for conditioning patients for bone marrow transplant.



Targeted conditioning is more specific compared to traditional conditioning. Traditional conditioning is performed with total body irradiation and chemotherapy which eliminates all hematopoietic cells and nonspecifically damages other organs. Targeted conditioning with an antibody drug conjugate specifically eliminates the hematopoietic stem cells while sparing the immune system and avoiding systemic side effects.

In our development of ADCs for use in conditioning, we are optimizing for several key parameters:

- First, the antibody must specifically target a receptor that is expressed on the cells of interest, but not on other cell types.
- Second, to comply with typical bone marrow transplant conditioning timelines, the antibody must have suitable efficacy to ensure that the ADC is able to kill the target cells rapidly, in days rather than weeks or months.
- Third, the antibody clearance needs to be accelerated so that it is eliminated by the time the transplanted cells are infused into the patient, typically within a week of starting conditioning. This requirement stems from the fact that the target receptor is expressed on cells present in the patient but also on the similar cell types in the transplanted cells.
- Finally, the linker-drug must be able to kill non-dividing cells as most HSC and immune cells are not actively dividing. The ADC linker must be chosen to minimize damage to non-target cells.

We are addressing each of these requirements through careful selection of the appropriate target receptor as well as antibody properties, including binding site, affinity, half-life and linker toxin.

We are developing three distinct programs for bone marrow conditioning that specifically deplete the particular cells that need to be removed to make room for the incoming cells. These programs share a common platform but differ in the cell types targeted: The C100 program targets HSCs, immune cells and disease-causing cells, the C200 program targets HSCs and disease-causing cells and the C300 program targets only immune cells. The lead antigen targets for C100 and C200 and potential applications for each program are listed in the table below.

	C100	C200	C300
Lead target	CD45	CD117	Undisclosed
Cells removed	Stem and immune cells Disease-causing cells	Stem cells Disease-causing cells	Immune cells
Diseases	Autoimmune diseases Blood cancers	Genetic diseases Genetic diseases (gene therapy) Blood cancers	Autoimmune diseases Blood cancers Blood cancers (CAR T)

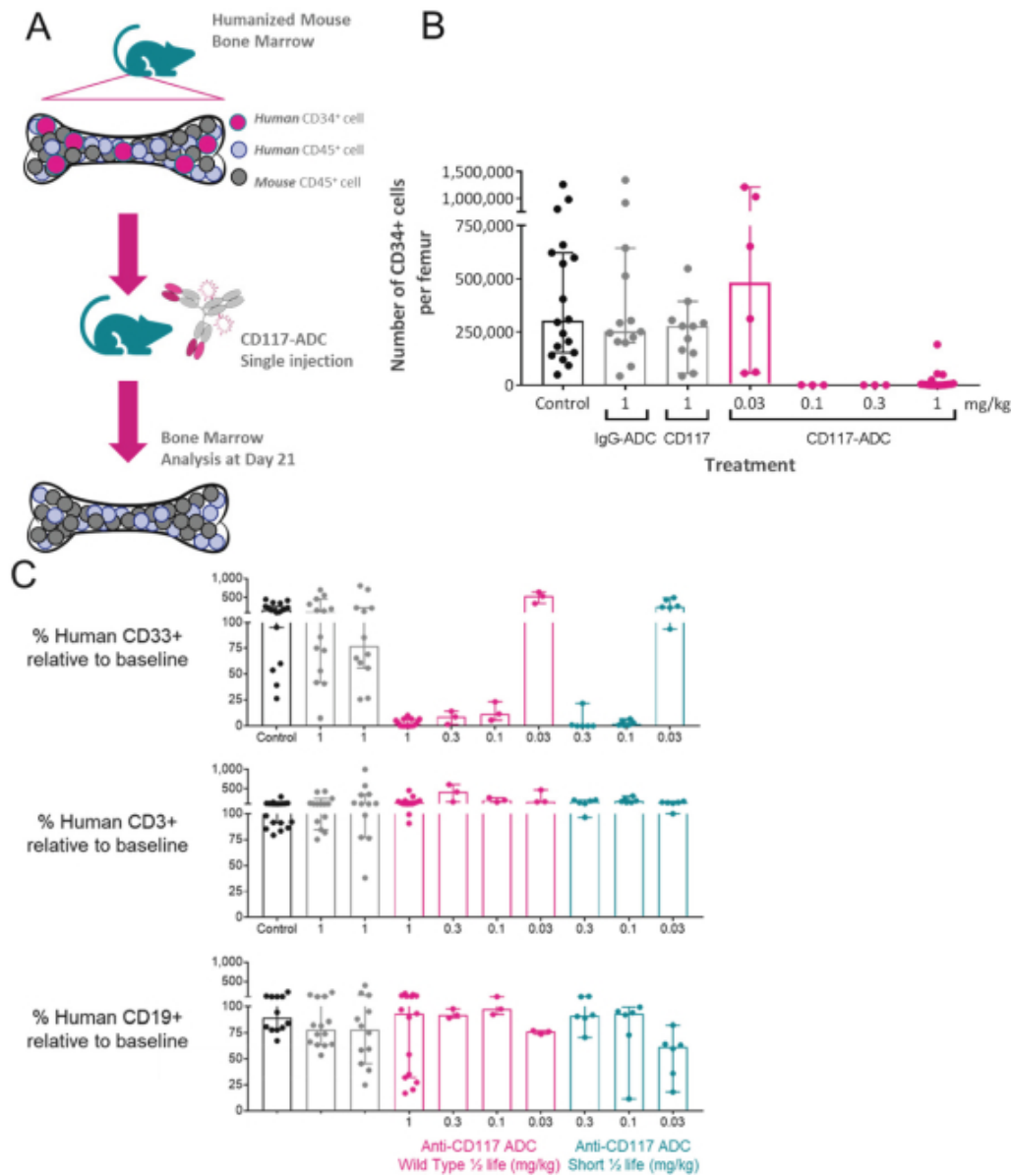
C200 program

Our most advanced conditioning program, C200, is designed to specifically deplete HSCs and disease-causing cells. Our lead ADC product candidate targets CD117, also known as c-Kit, which is expressed on HSCs, making it an ideal target for conditioning across broad sets of diseases. This includes blood cancers, hemoglobinopathies (sickle cell and beta-thalassemia), and inherited metabolic diseases, with potential applicability in both bone marrow transplant and HSC based gene therapy.

We are currently evaluating several key parameters to develop and optimize our CD117-ADCs for the C200 program. This includes investigating different toxins, methods of attaching the toxin to the antibody, the number of toxin molecules per antibody and modifications to the antibody that impact binding site and target affinity, half-life and interactions with other antibody binding proteins. The antibody components of our ADCs are designed to also recognize the target antigen in humans and non-human primates and deliver the toxin to target cells. This selectivity provides the opportunity to evaluate and optimize the efficacy and safety during preclinical studies in both mice bearing a human immune system and non-human primates prior to conducting human clinical trials. We are currently studying probe CD117-ADC molecules in mice and non-human primates and have seen encouraging preliminary data. The results using these probe CD117-ADCs are establishing proof of mechanism for the ability of CD117-ADC to selectively deplete HSCs, provide an early look at safety and tolerability and establish these critical preclinical mouse and non-human primate models to guide the further development of our C200 program.

Preclinical pharmacology studies

To investigate the potential of CD117-ADC to kill human HSCs *in vivo*, we performed studies using immunodeficient NSG mice that have been engrafted with human HSCs, a commonly used preclinical model to study human HSC biology. At the joint annual meetings of the American Society of Bone Marrow Transplant and the Center for International Blood and Marrow Transplant Research, or CIBMTR, and collectively, Tandem, in February 2018, we presented data showing that a single dose of CD117-ADC can deplete human HSCs *in vivo*. For this experiment, human engrafted mice were treated with a single dose ranging from 0.03 to 1 mg/kg of body weight of CD117-ADC or a variant of CD117-ADC modified to have a reduced half-life. Controls included mice that were untreated or treated with 1 mg/kg of an Isotype-ADC or unconjugated CD117 antibody. Analysis of human cell numbers in the blood of these mice showed a marked and stable reduction of HSC-derived CD33⁺ myeloid cells in mice treated with either variant of the CD117-ADC at doses of 0.1 mg/kg or higher, while lymphoid cells, including T cells, were unaffected. We believe this reflects the specificity of the CD117 antibody for HSCs and the rapid turnover of human CD33⁺ cells in this system due to engulfment by mouse-derived phagocytes and the lack of CD117 expression on lymphoid cells. The depletion of CD33⁺ myeloid cells was an on-target, toxin-dependent effect because the effect was not observed with the Isotype-ADC or unconjugated CD117 antibody. To confirm that the CD117-ADC can deplete human HSCs, the mice were euthanized three weeks after treatment and HSCs were enumerated in the bone marrow by flow cytometry. This analysis showed that both variants of CD117-ADC eliminated more than 95% of human CD34⁺ cells, at doses of 0.1 mg/kg or higher, while unconjugated CD117 antibody or Isotype-ADC had no impact on CD34⁺ numbers.

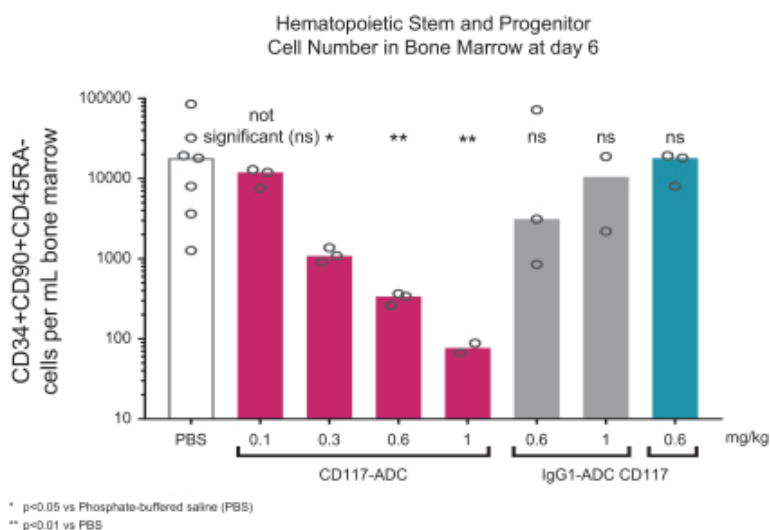


CD117-ADC selectively depletes human HSCs in humanized NSG mice. (A) Schematic of the *in vivo* model. CD117-ADC or controls were dosed on day 0. Peripheral blood mononuclear cells (PBMCs) and bone marrow were collected on day 21 and examined by flow cytometry. (B) The absolute number of CD34⁺ cells in the bone marrow of CD117-ADC or control treated mice. (C) Percent of human myeloid, T cells, and B cells present in the peripheral blood of CD117-ADC or control treated mice, expressed as a percent of that cell population prior to treatment (normalized to baseline).

Based on these positive findings in humanized mice, we next tested the ability of a probe CD117-ADC to deplete HSCs in non-human primates. This proof-of-mechanism study was designed as a dose escalation study to determine at what level, if any, CD117-ADC administration would result in HSC depletion and sustained

hematopoietic failure. In addition, the study was designed to provide preliminary safety data to guide further development. Successful HSC depletion with the ADC was expected to cause hematopoietic failure as these animals will not undergo a subsequent bone marrow transplant to replenish the depleted HSCs.

The ongoing study shows significant dose-dependent HSC depletion in the bone marrow six days after treatment with the probe CD117-ADC. In contrast, treatment with an unconjugated CD117 antibody or a control ADC not targeted to CD117 did not significantly impact HSC numbers in the bone marrow.



HSC numbers following a single dose of CD117-ADC or unconjugated CD117 antibody (CD117) or non-targeted ADC (IgG1-ADC); P-value is a conventional statistical method for measuring the statistical significance of experimental results. A p-value of less than 0.05 is generally considered to represent statistical significance, meaning that there is a less than five percent likelihood that the observed results occurred by chance.

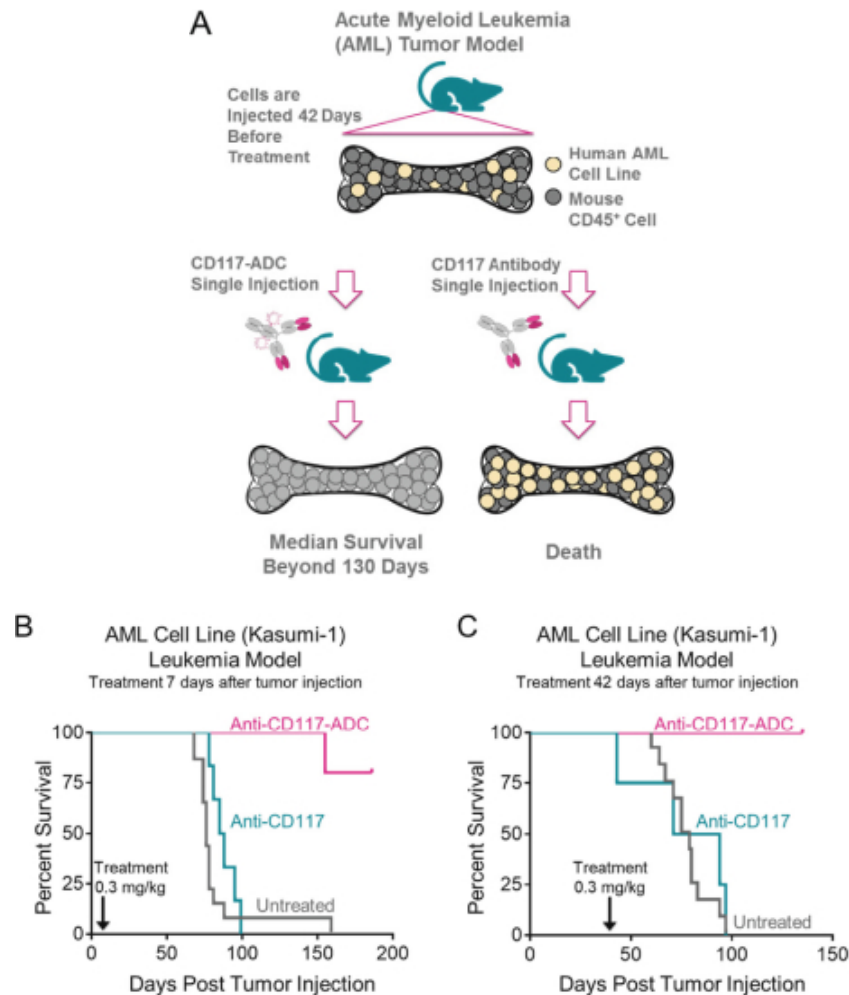
In this ongoing proof-of-mechanism study we observed some instances of transient elevation of liver enzymes that were dose- and toxin-dependent. Out of the 12 non-human primates treated with the probe CD117-ADC, one treated at the highest dose level was euthanized after receiving scheduled pain medication before a planned bone marrow aspiration. In addition, one non-human primate in each of the two highest dose groups showed the anticipated signs of bone marrow failure resulting from HSC depletion and was euthanized prior to the end of the study.

We believe this ongoing study is the first proof of mechanism showing that the probe CD117-ADC can successfully deplete HSCs in non-human primates. These data validate the non-human primate as a suitable model for efficacy and tolerability to guide the further development of our other ADCs in the C200 program. We expect to submit non-human primate data on our C200 program for presentation at future medical meetings.

Anti-tumor activity of CD117-ADC

In addition to its expressions on HSCs, CD117 is also frequently overexpressed on tumor cells in patients with acute myeloid leukemia and myelodysplastic syndromes. Thus, the CD117-ADC has the potential to reduce tumor burden in patients with CD117-expressing tumors. In data presented at the joint annual meetings of the American Society of Bone Marrow Transplant and the Center for International Blood and Marrow Transplant Research, or CIBMTR, and collectively, Tandem, in February 2018, we showed that CD117-ADC was effective

at killing human HSCs cultured *in vitro* and was also highly potent at killing the human acute myeloid leukemia cell line Kasumi-1. To extend these data, we also assessed the ability of CD117-ADC to reduce tumor burden and confer a survival benefit in mice bearing Kasumi-1 cells. For this study, mice were inoculated with a lethal dose of the Kasumi-1 cells and left either untreated or treated with CD117-ADC or unconjugated CD117 antibody seven days after tumor inoculation. Tumor-bearing mice treated with a single dose of CD117-ADC showed significantly improved survival compared to mice left untreated or those treated with unconjugated CD117 antibody. Treatment at 42 days after tumor inoculation, a time when untreated mice are showing overt signs of tumor toxicity, also led to improved survival with CD117-ADC, compared to mice that were untreated or treated with unconjugated CD117 antibody. These data suggest that CD117-ADC may have utility to treat leukemias through a direct cytotoxic effect on CD117-expressing tumors.



CD117-ADC effectively depletes human leukemic cells in NSG mice. (A) Schematic of *in vivo* leukemia model. Kasumi-1 cells were injected into NSG mice to serve as human cell line model of acute myeloid leukemia. A single injection of 0.3 mg/kg anti-CD117 ADC or anti-CD117 antibody occurred on **(B)** day 7 or **(C)** day 42 to assess the impact of tumor burden on efficacy. Survival curves of mice after tumor injection are shown.

[Table of Contents](#)

The targeted conditioning and potential for disease control offered by CD117-ADC may extend bone marrow transplant to additional leukemia patients and improve outcomes. This is especially important as acute myeloid leukemia and myelodysplastic syndromes represent areas of high medical need. Current treatment for patients with high-risk acute myeloid leukemia or myelodysplastic syndromes involves chemotherapy to induce disease remission followed by allogeneic bone marrow transplant. However, many patients are unable to achieve disease remission using current chemotherapy agents, rendering them ineligible for allogeneic transplant. Moreover, in the approximately 35% of eligible patients with acute myeloid leukemia and myelodysplastic syndrome that do receive a transplant, outcomes remain suboptimal with only 50% survival five years after transplant. In addition, many patients have co-morbidities such as increased age or decreased organ function that necessitate the use of a reduced intensity of conditioning which leads to higher rates of disease relapse. Because acute myeloid leukemia and myelodysplastic syndromes are increasingly seen in older patients, many patients are often deemed too frail to undergo a transplant, leaving them with limited treatment options. The anti-leukemia activity of CD117-ADC has the potential to reduce disease burden and improve outcomes for patients with CD117 expressing tumors, and allow relapsed/refractory patients with CD117-expressing tumors to have access to a bone marrow transplant.

Clinical development plans

Given the ability of CD117-ADC to deplete HSCs and CD117-expressing leukemia cells shown in our preclinical data, we intend to pursue a development plan for patients with acute myeloid leukemia and myelodysplastic syndromes. Once we have established a safe and effective dose in that study, we plan to explore multiple indications, including elderly patients with acute myeloid leukemia or myelodysplastic syndromes who are too frail to tolerate current conditioning protocols. The study would be designed to focus on single dose rising efficacy and safety. The studies' endpoints may include safety/tolerability, HSC depletion, and relapse prevention.

Approximately 47,000 patients in the U.S. and Europe are diagnosed with acute myeloid leukemia every year. Of those patients, about 60% achieve remission with chemotherapy agents and are eligible for transplant. However, of these, only approximately 30 to 40% actually receive a transplant. This is largely due to the toxicity risk associated with current conditioning protocols. We believe our conditioning agents would allow more patients to achieve remission and become eligible for transplant.

Approximately 34,300 patients in the U.S. and Europe are diagnosed with myelodysplastic syndromes every year. Of those patients, about 30% are eligible for transplant based on high risk disease. However, of these patients, only approximately 16 to 40% actually receive a transplant. This is largely due to the toxicity risk associated with current conditioning protocols. We believe our conditioning agents would allow more patients to achieve remission and become eligible for transplant.

We will also explore CD117-ADC in patients with non-malignant diseases, such as sickle cell disease, including those who are undergoing transplant with gene-modified stem cells.

C100 program

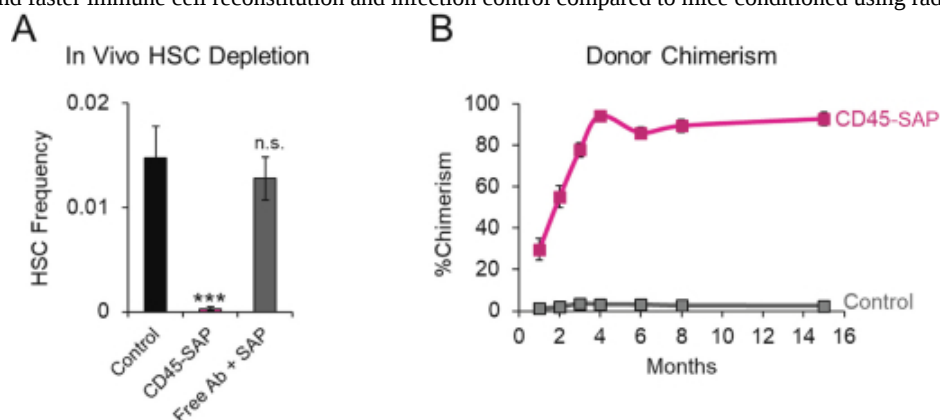
Other ADC-based conditioning programs in our portfolio include C100, a conditioning program with a profile that specifically depletes host HSCs and immune cells. Within our C100 program, our lead target is CD45, an important cell surface molecule broadly expressed throughout the hematopoietic and immune system. We are currently in the lead identification stage for this program and intend to declare a development candidate in 2019.

C100-targeting HSC and immune cells

For many applications of HSC transplant, it is important to eliminate both immune cells and HSCs in the patient prior to transplant. This is especially important in the allogeneic setting where host immune cells can elicit an immune-mediated rejection of the incoming foreign stem cells. In addition, immune cell depletion is a key

feature of the use of autologous transplant for the treatment of severe autoimmune disease. In this case, the goal is to eliminate the pathogenic auto-reactive immune cells that perpetuate the underlying autoimmune disease. Lastly, for patients with tumors expressing CD45, there may also be a direct anti-tumor effect providing additional therapeutic benefit. For these reasons, we are developing therapeutics that simultaneously target both HSCs and immune cells.

Pioneering work from Magenta founding scientists demonstrates that HSCs can be successfully targeted using a CD45-ADC to facilitate syngeneic transplant and allow for transplant-mediated cure of a mouse model of sickle cell disease. Importantly, CD45-ADC-treated mice show greatly reduced levels of organ damage and faster immune cell reconstitution and infection control compared to mice conditioned using radiation.



Source: Palchaudhuri et. al., Non-genotoxic conditioning for hematopoietic stem cell transplantation using a hematopoietic-cell-specific internalizing immunotoxin. Nature (2016).

CD45-SAP has potent cell-depletion activity and enables efficient donor-cell engraftment. (A) CD45-SAP depletes HSCs in C57BL/6 mice whereas non-biotinylated CD45 antibody in the presence of streptavidin-SAP does not. Data represent mean \pm s.d. (n = 5 mice/group, one of two independent experiments shown). HSCs were assessed by flow cytometry (Lin-cKit+Sca1+CD48-CD150+). (B) Long-term assessment of peripheral blood chimerism following CD45.2 GFP cell transplantation 8 days post CD45-SAP conditioning; all data points significant vs. control (P < 0.05). Data represent mean \pm s.d. (n = 5 mice/group, assayed individually).

To translate these initial mouse studies into human therapeutics, we have deployed our biotherapeutics and stem cell biology platforms to discover and develop anti-human CD45 ADCs. These platforms include antibody discovery campaigns to identify high-affinity antibodies able to bind to human CD45 protein and cell lines expressing CD45. Conjugation of these candidate antibodies to select toxins and testing in functional killing assays in cell lines expressing CD45 and human HSCs growing *in vitro* is used to select lead antibodies for characterization *in vivo*. We anticipate nominating a development candidate for the C100 program in 2019.

Clinical development plans

We expect to conduct our initial clinical trials in patients with lymphomas and leukemias. Once we have established a safe and effective dose, we intend to begin testing C100 product candidate(s) in autoimmune diseases, such as multiple sclerosis and scleroderma. The study would be designed to focus on single dose rising efficacy and safety. The studies' endpoints may include safety/tolerability, HSC depletion, immune cell depletion and relapse prevention.

There are approximately 72,000 cases of non-Hodgkin lymphoma diagnosed in the U.S. each year, of which approximately 6,500 are eligible for transplant; and in Europe there are approximately 95,000 new cases of

[Table of Contents](#)

non-Hodgkin lymphoma each year, with 8,500 eligible for transplant. Of these patients, approximately 60 to 80% receive a transplant. Approximately 47,000 patients in the U.S. and Europe are diagnosed with acute myelogenous leukemia every year. Of those patients, about 60% achieve remission with chemotherapy agents and are eligible for transplant. However, of these, only approximately 30 to 40% actually receive a transplant. This is largely due to the toxicity risk associated with current conditioning protocols. We believe our conditioning agents would allow more patients to achieve remission and become eligible for transplant.

Multiple sclerosis is diagnosed in approximately 15,000 patients in the U.S. and 32,000 patients in Europe annually. To assess eligibility in this population, we focused on the patients with active relapsing-remitting disease and relapsing secondary progressive multiple sclerosis patients who are not adequately treated by current therapies. This population represents approximately 45,000 multiple sclerosis patients who switch therapies each year in the U.S., and we believe that a greater population of patients switch therapies each year in Europe. Many of these patients switch because their current therapy does not adequately control disease activity such as relapses. Given bone marrow transplant's ability to durably eliminate relapses and disease activity in multiple sclerosis patients, we believe a safer transplant procedure would be a viable option for those patients with highly active disease beyond what therapeutics can manage. Currently approximately 1 to 2% of eligible multiple sclerosis patients in the U.S. and Europe receive a bone marrow transplant because the risk of the process outweighs the benefits of a potential cure, and we believe we can significantly expand this number.

Scleroderma, a chronic connective tissue disease that is characterized by thickening of the skin, is diagnosed in approximately 6,600 patients in the U.S. and 10,900 patients in Europe annually. Approximately 35% (2,300 patients in U.S., 3,800 patients in Europe) of scleroderma patients suffer from diffuse cutaneous disease and are therefore eligible for bone marrow transplant. Currently, approximately 1% or less of eligible scleroderma patients in the U.S. and Europe receive a bone marrow transplant, though the recent inclusion of bone marrow transplant in the European League Against Rheumatism, or EULAR, treatment guidelines for scleroderma may increase this number. With this increased acceptance of bone marrow transplant as a treatment option for scleroderma and the opportunity for a safer transplant procedure through targeted conditioning, we believe transplant could become a new standard of care for patients with severe scleroderma, who have no other therapeutic options available.

C300 program

Our third ADC-based conditioning program, C300, targets T cells. T cell depletion is currently performed with highly toxic non-specific drugs, which can lead to immune deficiency, infections and other complications, including secondary autoimmune reactions. We are pursuing targets expressed on the surface of T cells with the goal of offering a safer and more optimized conditioning approach to prevent transplant rejection prior to allogeneic bone marrow transplant, achieve immune system depletion before autologous bone marrow transplant in autoimmune disease patients or condition patients prior to infusion of CAR T therapy for blood cancers,.

Stem cell mobilization program

Unmet need

Successful stem cell transplantation requires collection of HSCs in both sufficient number and quality to allow for robust engraftment, recovery of blood cells, and lifelong maintenance of the hematopoietic system. Higher cell doses are associated with better outcomes in bone marrow transplant.

Current methods for stem cell collection include a bone marrow harvest, a procedure performed under general anesthesia, or mobilization of stem cells from the bone marrow to blood, where they are then collected through a process called apheresis. The autologous transplant field has moved away from bone marrow harvest in recent years, due to the difficulty of the procedure for both patients and physicians, and there is a need for better HSC mobilization agents for apheresis.

Table of Contents

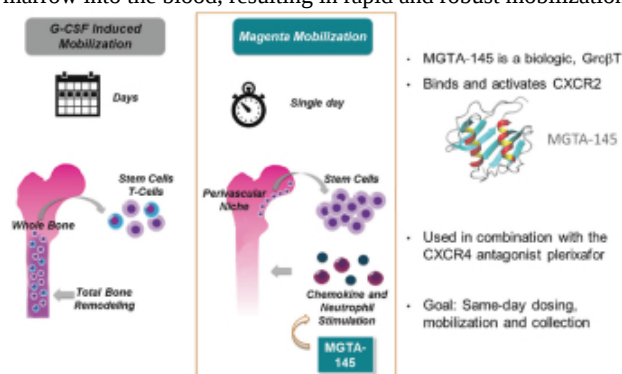
The predominant source of HSCs for adult transplant is mobilized peripheral blood that is acquired by apheresis, or collection of donor or patient blood after several days of injections of G-CSF. G-CSF mobilizes stem cells indirectly, requiring repeated daily injections, and is often associated with bone pain, nausea, headache, and fatigue. The multi-day regimen can take up to a week and side effects can be disruptive for both patients having their cells collected for autologous transplants and for healthy volunteers donating their cells for allogeneic transplants. It is difficult to predict whether mobilization will be successful, especially in heavily treated blood cancer patients. In fact, most patients require multiple apheresis sessions and some patients require more than one stem cell collection procedure to obtain a sufficient number of cells for transplant. Mobilization failure rates are as high as 35% in patients with multiple myeloma or non-Hodgkin lymphoma. For patients who are unable to mobilize sufficient numbers of stem cells with G-CSF, physicians are then required to retreat with G-CSF and add another drug, called plerixafor. Plerixafor acts as a small molecule CXCR4 antagonist, blocking a pathway that otherwise plays an essential role in attracting and retaining HSCs in the bone marrow. It is approved for use in combination with G-CSF for patients who fail to achieve sufficient mobilization of stem cells with G-CSF alone. It can mobilize stem cells as a single agent but not to sufficient levels to be used as a standalone agent. In addition, G-CSF is also contra-indicated in some patient populations, such as patients with sickle cell disease, and it can exacerbate autoimmune diseases.

Our solution

MGTA-145 is a novel stem cell mobilization product candidate that was developed based on our understanding of the physiological mechanisms that control stem cell mobilization. The goal of MGTA-145 is to achieve high levels of stem cell mobilization in patients and donors in order to offer a rapid and robust mobilization option that does not require the use of G-CSF, which is the current standard of care. MGTA-145 is a CXCR2 agonist protein that activates neutrophils to release proteases that cause the release of HSCs into the blood. This novel mechanism of action is complementary to that of plerixafor. Preclinical data have shown that the synergistic combination of MGTA-145 and plerixafor leads to robust and rapid stem cell mobilization. Further, these mobilized stem cells outperform stem cells mobilized by G-CSF in mouse transplant models.

Mechanism of action

CXCR2 is a chemokine receptor expressed on the surface of neutrophils. Binding of MGTA-145 to the receptor results in neutrophil activation. Published data from Magenta founders and scientists show that a key event for mobilization of stem cells is the MGTA-145-mediated release of proteases from activated neutrophils, which together with the actions of the CXCR4 antagonist, plerixafor, results in the rapid release of HSCs from the bone marrow into the blood. Blocking CXCR4 using plerixafor and activating neutrophils with MGTA-145 together produce an effective and synergistic untethering and release of HSCs from bone marrow into the blood, resulting in rapid and robust mobilization of HSCs.

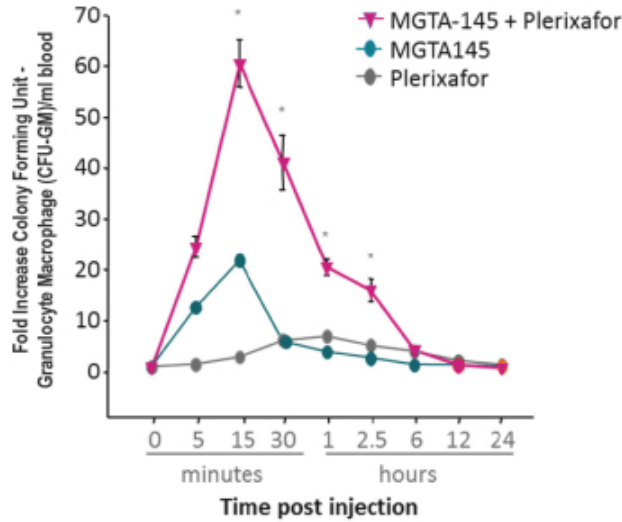


The goal of MGTA-145 is to enable single day mobilization of high numbers of HSCs. Mobilized peripheral blood stem cells are currently the predominant source of HSCs for both autologous and allogeneic

transplantation. The most common clinical HSCs mobilization protocol is five days of G-CSF. This regimen requires daily injections, has been associated with bone pain and often results in unpredictably low yields. MGTA-145, in combination with plerixafor, provides a rapid mobilization method that only requires a single treatment and has robust and predictable kinetics. The stem cells mobilized with this combination contain a higher frequency of HSCs compared to those mobilized with G-CSF, which could significantly improve transplant outcomes over the current standard of care.

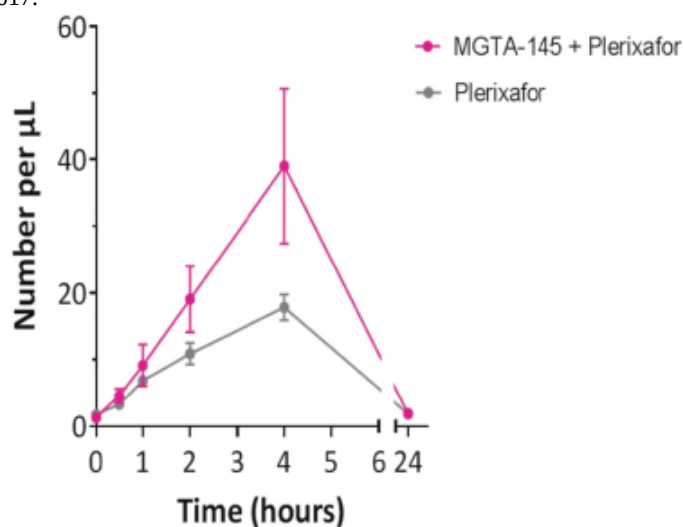
Preclinical development

Research from Magenta scientific collaborators from Harvard and Massachusetts General Hospital published in *Cell* in December 2017 demonstrates that a single administration of MGTA-145, in combination with plerixafor, resulted in rapid mobilization of robust numbers of HSCs from the bone marrow and into the blood. The cells were then harvested for transplant in mouse models. Notably, HSCs mobilized with MGTA-145 and plerixafor and subsequently transplanted into mouse models resulted in faster engraftment and higher levels of donor cells, two important factors for the success of a transplant, compared to cells obtained with the current mobilization standard of care, G-CSF.



The combination of MGTA-145 and plerixafor rapidly mobilizes mouse HSCs. Blood was assessed at various time points after administration of plerixafor (5mg/kg), MGTA-145 (2.5mg/kg) or MGTA-145 plus plerixafor combination given simultaneously. Mean ± the standard error of the mean (SEM) from n = 4 BALB/c mice/group/time point. *p < 0.01 versus MGTA-145 or plerixafor ANOVA. (Ref: Hoggatt et al., 2018, *Cell* 172, 1–14)

In studies in non-human primates, we showed that a single administration of MGTA-145, in combination with plerixafor, induces robust mobilization of a transplantable dose of CD34+CD90+CD45RA- HSCs within four hours of administration. CD34+CD90+CD45RA- cells are highly enriched for HSCs and are important for long-term engraftment and hematopoietic reconstitution, both of which influence patient outcomes. These data were presented at the ASH annual meeting in December 2017.



CD34+ cells mobilized in response to MGTA-145 + plerixafor contain a high fraction of primitive CD34+CD90+CD45RA- stem cells. The absolute numbers of CD34+CD90+CD45RA- HSCs in whole blood for each treatment group is shown. Data are expressed as mean ± SEM and represent five animals per group. Dotted line represents level of mobilization required to achieve transplantable dose.

Taken together, these data suggest that MGTA-145 with plerixafor offers a more robust, safer and more practical alternative to G-CSF for mobilization of stem cells for use in autologous and allogeneic transplant.

Clinical development plan

Based on the results presented at the ASH annual meeting in December 2017, we have initiated IND-enabling studies of MGTA-145 in combination with plerixafor and expect to file an IND with the FDA for this product candidate in 2019. We plan to develop MGTA-145 for mobilization first in patients with multiple myeloma and non-Hodgkin lymphoma, followed by healthy donors for allogeneic transplant.

There are approximately 30,000 cases of multiple myeloma diagnosed in the U.S. each year, of which approximately 15,000 are eligible for transplant; and in Europe there are approximately 40,000 cases diagnosed each year, with 20,000 eligible for transplant. There are approximately 72,000 cases of non-Hodgkin lymphoma diagnosed in the U.S. each year, of which approximately 7,200 are eligible for transplant; and in Europe there are approximately 95,000 new cases of non-Hodgkin lymphoma each year, with 9,500 eligible for transplant.

In the U.S. approximately 65% of stem cell donors donated through peripheral blood mobilization in 2016. In Europe, 73% of all donors donated through peripheral blood mobilization. The number of patients requiring mobilization may increase as safer transplant conditioning protocols, such as the ones we are developing, increase the number of patients eligible for transplant, including patients with autoimmune or sickle cell disease.

We plan to further investigate MGTA-145 in patient populations where G-CSF can exacerbate the disease, such as autoimmune diseases, and patient populations where G-CSF is contra-indicated, such as sickle cell disease.

Stem cell expansion program: cord blood

Unmet need

Bone marrow transplant is a life-saving procedure with curative potential; however, up to half of the approximately 23,000 patients requiring an allogeneic bone marrow transplant will not find a suitable donor within their families or among the registered bone marrow donors. In addition, long search times for unrelated donors and their frequent unavailability represent a major challenge, particularly for patients with diseases that can progress rapidly, such as high-risk acute leukemia and certain inherited metabolic diseases. Because of the urgency for these patients to undergo transplant, there is a need for new options, and the ability to find a well-matched stem cell donor with sufficient cells remains one of the most significant hurdles in bone marrow transplant.

Challenges in finding a matched donor

The probability of finding a matched donor is influenced by the complexity and frequency of the patient's human leukocyte antigen, or HLA, type in the population and among the 25 million registered bone marrow donors. The HLA is a group of highly variable proteins involved in immune recognition, present on nearly all cells. Differences in HLA genes between the stem cell donor and the patient can result in severe complications, including GvHD, where the donor T cells in the transplant cells attack the patient, or rejection, where the patient T cells attack the donor stem cells, leading to transplant rejection. In bone marrow transplant, donors and patients are typically matched for both copies of four key HLA genes, or eight "loci", with the best results occurring when donor and patient are matched at all eight loci. Patients transplanted with bone marrow stem cells matched at seven of eight loci have inferior outcomes compared to those who matched at eight of eight loci, with an 8% reduction in the probability of survival five years after transplant. Thus, bone marrow transplant is not commonly performed with mismatched bone marrow grafts. The probability of finding a well matched eight of eight donor differs widely depending on the patient's HLA type, which is reflective of their ethnicity. Caucasian patients of western European descent have an approximately 75% probability of identifying an eight of eight matched donor, while patients of African descent have an approximately 16% probability, with other ethnic groups having an intermediate probability.

Opportunities and challenges related to cord blood transplant

For patients who do not have a well-matched donor, umbilical cord blood provides a potential source of suitably matched stem cells. However, despite the proven utility of cord blood transplant, significant challenges remain.

First, even when a patient has a matched cord blood unit, transplants are often not performed because there are too few stem cells in the cord blood unit. Cord blood units are currently selected based on a minimum cell dose threshold per kilogram of patient body weight, with the best HLA match unit selected from among those large enough for use. Since stem cell dose is based on the number of stem cells per kilogram of patient body weight, cord blood is more commonly used in smaller pediatric patients than in adults. Although more than 712,000 frozen cord blood units are available in the worldwide cord blood inventory, current cell dose requirements mean that less than approximately 4% of these units are suitable for use in adult patients. The low number of units available for use in adults negatively impacts the ability to identify a well-matched cord blood unit because the searchable pool of adequately sized units is drastically limited.

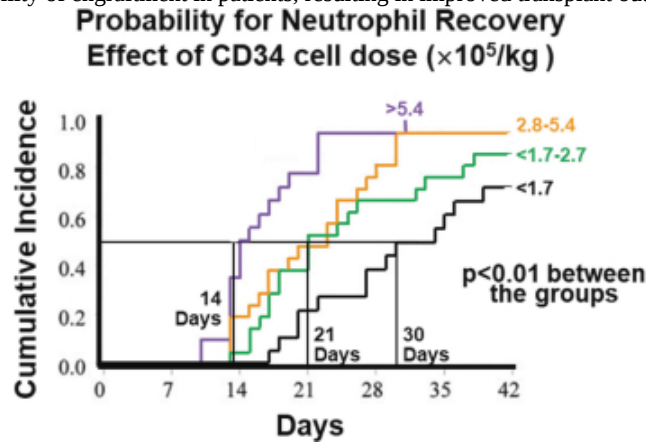
Currently an adult Caucasian patient in the U.S. has an approximately 40% chance of finding a seven of eight matched cord blood unit, and an adult patient of African descent has only an approximately 5% chance.

Secondly, even when a cord blood unit of adequate size is identified, engraftment can be slow and there is an increased risk of life-threatening infections and transplant failure compared to other stem cell sources. These complications result from the low number of stem cells present in cord blood units, since the speed and probability of engraftment are positively correlated with the number of stem cells in the graft. Thus, the higher

the number of stem cells, the faster the engraftment and the lower the likelihood that the patient will experience transplant failure.

The ability to expand HSCs in cord blood has the potential to address the challenge of low cell doses typically obtained from cord blood, and thereby:

- increase the available pool of cord blood units, allowing more patients to obtain better matched cord blood units; and
- improve the speed and probability of engraftment in patients, resulting in improved transplant outcomes.



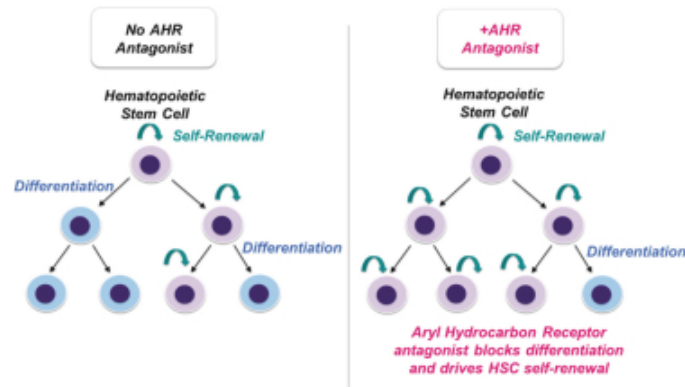
Wagner et al, Blood 2002; 1611-8

Increase in CD34 cell dose improves engraftment and speed of hematopoietic recovery. Cumulative incidence of neutrophil engraftment after unrelated donor cord blood unit transplantation (n = 102): effect of CD34 cell dose ($\times 10^5/\text{kg}$ of recipient body weight).

Our solution

MGTA-456, is a novel allogeneic stem cell therapy, produced by expanding a single umbilical cord blood unit *ex vivo* with a proprietary small molecule aryl hydrocarbon receptor, or AHR, antagonist.

Blockade of AHR is a novel, well-studied and clinically validated pathway that controls the self-renewal and differentiation of human HSCs. Growing human HSCs in the laboratory with growth factors leads to cell division; however, this is accompanied by differentiation of the cells into more mature cell types, resulting in the loss of HSCs. Magenta scientists discovered that growth factor treatment activates the AHR pathway, which leads to differentiation and loss of HSCs. Including an AHR antagonist during HSC culture blocks the AHR pathway, thereby inhibiting differentiation and leading to an increase in the number of HSCs.



Schematic showing the impact of AHR antagonist on stem expansion culture. Purple cells represent HSCs and blue cells represent differentiated, non-HSCs.

The ability to expand HSCs *ex vivo* using an AHR antagonist has the potential to address many of the current challenges of cord blood transplant. Since the speed and probability of engraftment are increased with the number of HSCs within the cord blood unit, increasing the dose of stem cells is predicted to speed engraftment and immune reconstitution, reduce the probability of engraftment failure, and allow the use of cord blood in adult patients. In addition, MGTA-456 also has the potential to improve overall survival by allowing more patients to have access to better HLA-matched cord blood units, which is associated with better outcomes and lower rates of post-transplant complications.

We obtained the rights to MGTA-456 through an April 2017 license agreement with Novartis granting us the sole worldwide rights to research, develop and commercialize certain AHR antagonist compounds specifically for the expansion of cord blood-derived non-gene-edited/-modified HSCs.

Clinical history of MGTA-456

The goal of the first clinical study was to determine if MGTA-456 was safe and could provide more rapid and complete engraftment, and if the engraftment was able to supply long-term (longer than one year) hematopoietic recovery. If MGTA-456 was shown to be a reliable source of engraftable long term HSCs in the double cord blood transplant setting, the product would next be tested as the sole source of HSCs in the single cord blood transplant setting.

Initial first-in-human studies: double blood cord transplant

Initial clinical testing of MGTA-456 was done by Novartis between 2012 and 2016 in adult (n=15) and pediatric (n=3) patients with blood cancers conditioned with a myeloablative protocol, which means near-complete elimination of stem cells in the bone marrow. The study focused on the simultaneous transplant of two cord blood units, or double cord blood transplant, where one unit was expanded using the AHR antagonist to produce MGTA-456 and the other unit was unmanipulated. A second study commenced in 2014 and ended in 2016. Both studies were completed at the University of Minnesota.

The first clinical study was a first-in-human, single-arm, single-center, open-label, proof-of concept study to evaluate the safety and tolerability of infusing MGTA-456 in patients with blood cancers. In this study, a total of 31 patients (mean age 32 years) were enrolled and 27 were infused with MGTA-456. These 18 patients were treated with double unit cord blood transplant, or DUCBT, until sufficient data were available to support a single UCB transplant, of which 9 patients were eligible, with an acceptable benefit-risk. Primary endpoints of the study were lack of infusional toxicity and absence of excess graft failure, secondary endpoints were time to neutrophil

[Table of Contents](#)

recovery, incidence of neutrophil recovery within 42 days, incidence of platelet recovery within six months, frequency of expanded unit predominance at day 100 (DUCBT recipients only), incidence of transplant related mortality within 100 days and one year, incidence of acute GvHD within 100 days, incidence of chronic GvHD within one year, incidence of relapse within one year and overall survival and disease free survival within one year.

The second clinical study for MGTA-456 was a single-arm, open-label study to evaluate the safety and tolerability of infusing MGTA-456 in patients with blood cancers undergoing UCB transplantation using a non-myeloablative conditioning regimen. MGTA-456 was used as the only source of HSC in SUCBT. Patients between the ages of 18-70 years eligible for UCB transplant were enrolled into this study. Of the nine patients enrolled in the study, two had diagnoses of acute leukemia, three had myelodysplastic syndromes, one had non-Hodgkin's lymphoma, one had multiple myeloma, one had chronic lymphocytic leukemia, and one had myeloproliferative disease. The study's primary endpoint was absence of excess graft failure at day 42, secondary endpoints of incidence of neutrophil recovery within 42 days, incidence of transplant related mortality within 100 days and one year and overall survival and disease free survival within one year.

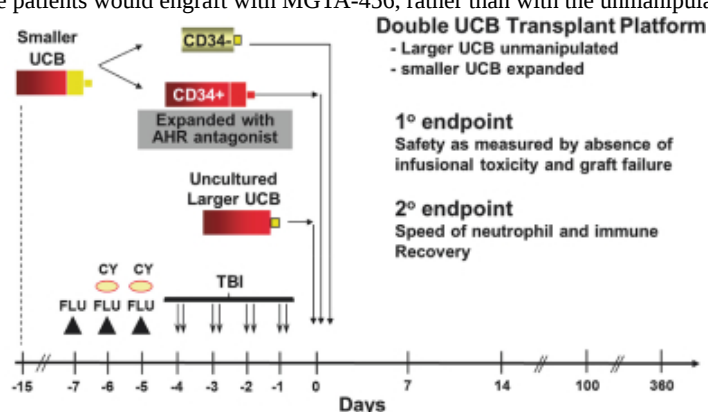
In these clinical studies, no study stopping rules were met. Specifically, no infusional toxicity that prohibited administration of the product and no primary graft failure were observed in any patient. All transplanted patients achieved neutrophil engraftment with a median of 14 days in the first clinical study and seven days in the second clinical study.

In the first clinical study, a total of 14 of 27 patients died, including three after the one-year study completion visit. There were five deaths in the second clinical study, including one after the end of the study. None of the deaths in either study were suspected to be related to the investigational product administered in the studies. Collectively, there were five serious adverse events suspected to be related to MGTA-456 in four patients. Of these serious adverse events, events of febrile neutropenia and hypotension occurred in one patient, with three other patients each reporting an event of pre-engraftment syndrome. All patients from the aforementioned studies were eligible to participate in the ongoing five-year follow-up study. Overall, the infusion of MGTA-456 showed a favorable safety profile. No study-stopping rules were met and all patients engrafted, including those transplanted following non-myeloablative conditioning.

In December 2015, prior to our license of MGTA-456 from Novartis, the FDA imposed a partial clinical hold on the cryopreserved part of the protocol covered by the IND application for MGTA-456 until Novartis demonstrated comparability between the fresh and cryopreserved product. This partial clinical hold was later removed by the FDA in June 2016.

These first-in-human studies used the double cord blood approach primarily for patient safety, to provide a source of HSCs in case the manufacturing process used to produce MGTA-456 led to HSC loss. The simultaneous use of two cord blood units was originally used as a procedure to increase the number of HSCs in adult cord blood transplantation. In this model, immune-mediated rejection of one cord blood unit by the T cells present in the competing unit results in a single unit "winning" and providing long-term engraftment in more than 90% of patients. Clinical trials of double cord blood transplant have shown that while T cells dictate which cord wins, the time to neutrophil engraftment of the winning cord blood is determined by how many HSCs are present in the cord blood unit that wins, with the larger of the two cord blood units winning two-thirds of the time.

For these initial studies, two units were obtained that were matched to the patient and each other, and the smaller of the two units was expanded for 15 days using an AHR antagonist to produce MGTA-456. On the day of transplant, patients received the unmanipulated cord blood unit, followed by MGTA-456 and the previously cryopreserved CD34-depleted fraction matched to MGTA-456. Since MGTA-456 was produced from the smaller unit, the expectation was that one-third of the patients would engraft with MGTA-456, rather than with the unmanipulated cord blood unit.



Schematic of the first in human clinical trial for MGTA-456. On day -15 the smaller umbilical cord blood (UCB) unit is thawed and the CD34+ cells are selected and expanded in the presence of an AHR antagonist. On day -7 to day -1 the patient is conditioned with fludarabine (FLU), cyclophosphamide (CY), and total body irradiation (TBI). On day 0, the larger, unmanipulated UCB unit is infused followed by the expanded CD34+ cells. The following day (day 1), the CD34-fraction is infused.

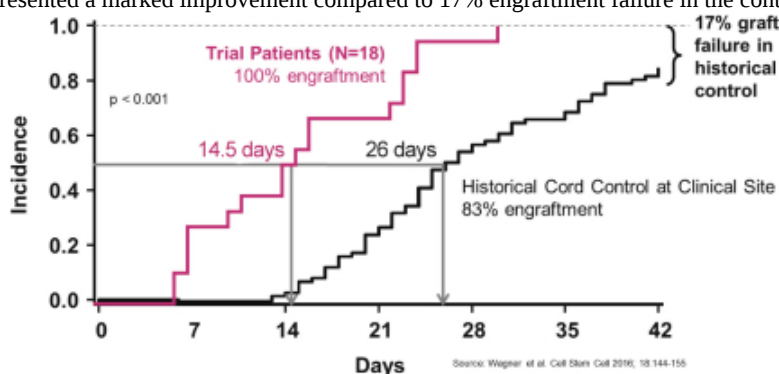
**First-in-Human Trial – of MGTA-456
Patient Demographics**

Factors		MGTA-456	Historical Control	p
Number		18	121	
Age (yrs)	Median (range)	28 (12-53)	26 (11-51)	0.12
Weight (kg)	Median (range)	87.8 (41.6-129.9)	70.1 (31.6-148.6)	0.07
Gender	Male	67%	53%	0.27
Diseases	ALL	11	54	0.05
	AML	5	64	
	MDS	2	3	
Status	% CR1	78%	55%	0.07
CMV sero	Positive	56%	56%	0.96
Karnofsky	90-100	94%	93%	0.98

Demographics of patients treated with MGTA-456 and historical and concurrent controls treated with the same conditioning protocol with single or double unmanipulated cord blood units at the clinical site. The trial based the patient inclusion/exclusion criteria on historical and concurrent controls. Patient demographics were comparable.

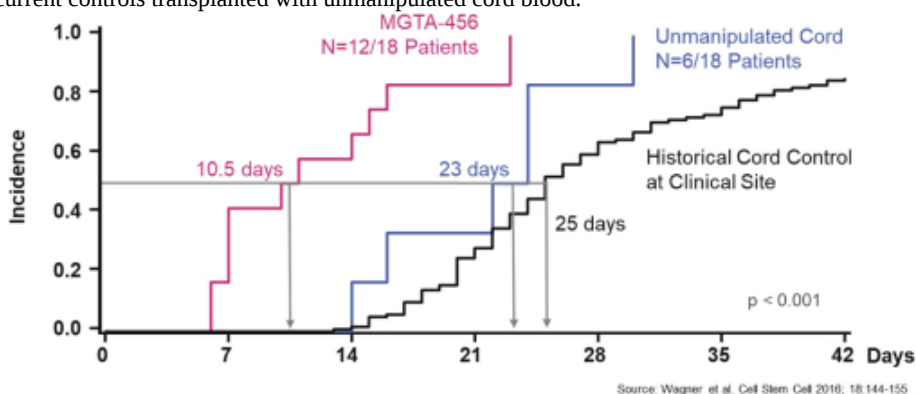
A total of 18 patients were treated and all patients successfully engrafted neutrophils (absolute neutrophil count greater than 500 per mL of blood for three days) with a median time to engraftment of 14.5 days – significantly faster than the 26 days seen in historical and concurrent cord blood transplant recipients treated at the same site with the same myeloablative conditioning protocol. There were no early or late engraftment failures in patients

treated with MGTA-456, which represented a marked improvement compared to 17% engraftment failure in the control cohort.



Rate and incidence of neutrophil recovery in recipients of MGTA-456 compared to historical controls (double cord blood transplant)

Of the 18 patients treated in the double cord blood study, the MGTA-456 product predominated in 12 patients and the unmanipulated unit in six. Since MGTA-456 was produced from the smaller unit, the expectation was that only one-third of the patients would engraft with MGTA-456. Patients who engrafted with MGTA-456 recovered neutrophils by 10.5 days, while those who engrafted with the unmanipulated cord blood unit engrafted in 23 days, similar to historical and concurrent controls transplanted with unmanipulated cord blood.



Rate and incidence of neutrophil recovery in patients engrafted with MGTA-456 compared to patients engrafted with unmanipulated cord blood units and historical and concurrent control patients

These published studies demonstrate that MGTA-456 results in rapid and durable engraftment when used in the double cord blood transplant protocol with myeloablative conditioning.

Use of MGTA-456 as a sole stem cell source: single cord blood transplant

Additional clinical trials were undertaken to investigate the ability of MGTA-456 to act as a stand-alone source of stem cells without a second cord blood unit under a range of conditioning protocols. In data presented at the ASH annual meeting in December 2017 from a Phase I/II study, single cord blood units were expanded for 18 additional adult and adolescent patients with blood cancers. Nine patients underwent a myeloablative conditioning regimen before transplant, and the other nine patients received non-myeloablative conditioning.

[Table of Contents](#)

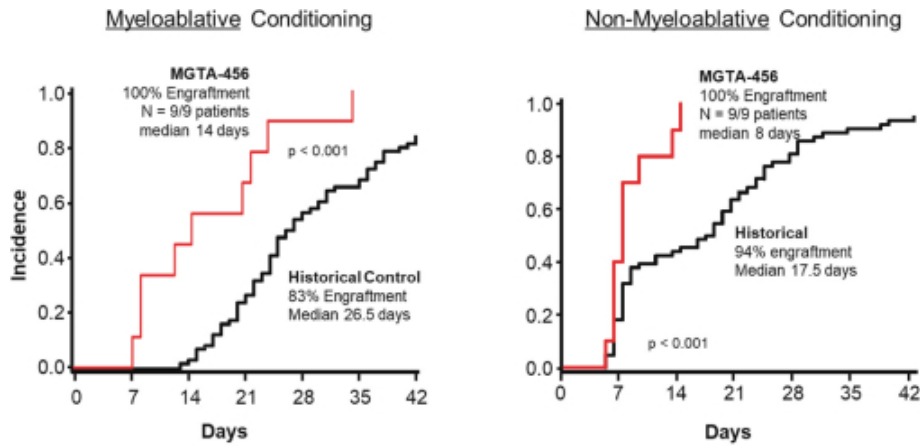
Patient demographics were similar between MGTA-456 and the control cohorts, except patients in the myeloablative study treated with MGTA-456 were heavier and patients in the non-myeloablative study were older and had a higher risk disease status. These traits suggest more challenging patient populations to treat.

Factors		MGTA-456	Historical Control	P value
Number		9	132	
Age (yrs)	Median (range)	65.0 (29-70)	53 (6-72)	0.03
Weight (kg)	Median (range)	93.4 (55-111)	81.4 (22-145)	0.22
Disease	ALL/AML	1/0	61 (46%)	<0.01
	MDS	4	25 (19%)	
	CML/CLL	0/1	9 (7%)	
	HD/NHL	0/1	35 (27%)	
	Other	2	2 (2%)	
Status	High Risk	89%	49%	0.03

Factors		MGTA-456	Historical Control	P value
Number		9	151	
Age (yrs)	Median (range)	25 (15-53)	27 (2-54)	0.13
Weight (kg)	Median (range)	93.8 (41-107)	66.7 (11-136)	0.04
Disease	ALL/AML	78%	85%	0.63
	MDS	11%	3%	
	CML/CLL	0	3%	
	NHL/HD	11%	9%	
Status	High	11%	17%	0.67

Demographics of patients in which MGTA-456 was tested as a sole stem cell source (myeloablative top, non-myeloablative bottom)

MGTA-456 successfully engrafted in all 18 patients, with rapid time to neutrophil engraftment and immune recovery regardless of conditioning intensity, as compared to historical and concurrent controls transplanted with unmanipulated cord blood using the same myeloablative or non-myeloablative conditioning protocols. For the myeloablative protocol, all patients transplanted with MGTA-456 engrafted with a median time to neutrophil recovery of 14 days, significantly faster than the 26.5 days seen in historical and concurrent controls transplanted with unmanipulated cord blood using the same myeloablative protocol. Engraftment failure was not observed in any of the patients transplanted with MGTA-456, in contrast to the historical controls where 17% of patients failed to engraft. Among patients conditioned with the non-myeloablative protocol, all patients treated with MGTA-456 engrafted with a median time to neutrophil recovery of eight days, which is significantly faster than the 17.5 days observed in historical controls. There were no early engraftment failures among patients treated with MGTA-456, in contrast to the historical controls where 6% of patients failed to engraft. There were no late engraftment failures in any patient treated with MGTA-456, with a median patient follow-up of two years for all studies, supporting the view that MGTA-456 contains HSCs that retain long-term engraftment.

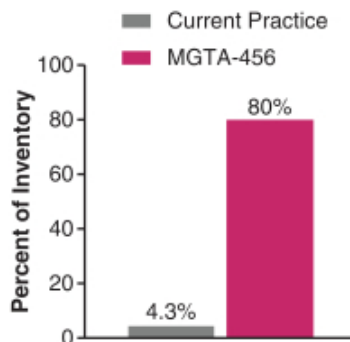


Time to engraftment, as defined by neutrophil recovery, for patients transplanted with MGTA-456 after myeloablative (left) or non-myeloablative (right) conditioning

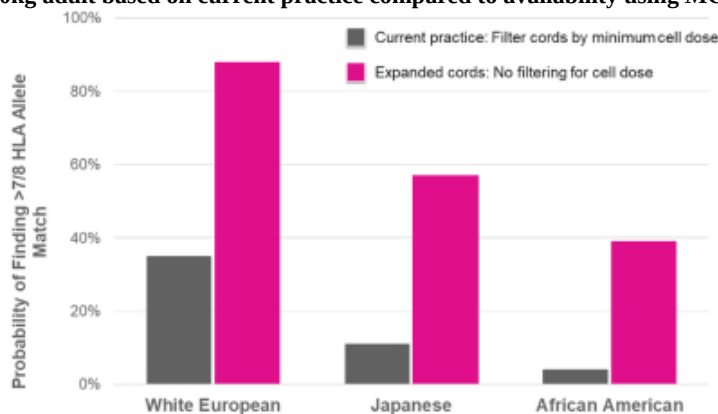
These studies showed rates of acute GvHD and disease relapse with MGTA-456 and overall survival that were comparable to historical cohorts. These preliminary data suggest that MGTA-456 increases the speed and probability of engraftment while substantially preserving the previously reported benefits of cord blood transplant of low acute GvHD, low relapse and favorable overall survival.

Impact of MGTA-456 on cord blood HLA matching

MGTA-456 allows for expansion of smaller units that would otherwise not be suitable for transplant. This effectively increases the available cord blood inventory for adults from approximately 4% of all units to approximately 80%. Analysis of the current cord blood inventory in collaboration with CIBMTR using the lower starting cell dose threshold for MGTA-456 showed that the ability to identify an optimal cord blood unit matched at seven of eight HLA loci increases for all patients. This is particularly improved for patients of African or Japanese ancestry for whom it is especially difficult to find well matched units. Since better matched units yield superior outcomes, the ability to use these smaller well matched units is anticipated to improve transplant outcomes.



Cord blood unit availability for an 80kg adult based on current practice compared to availability using MGTA-456 expanded cords

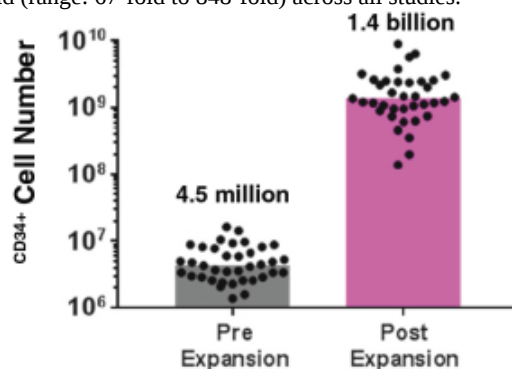


Impact of lower cell dose threshold for MGTA-456 on the probability of finding a $\geq 7/8$ allele matched cord blood unit for patients of different ethnicities. Current practice minimum cell dose of 25 million total nucleated cells per kg of body weight.

MGTA-456 manufacturing process

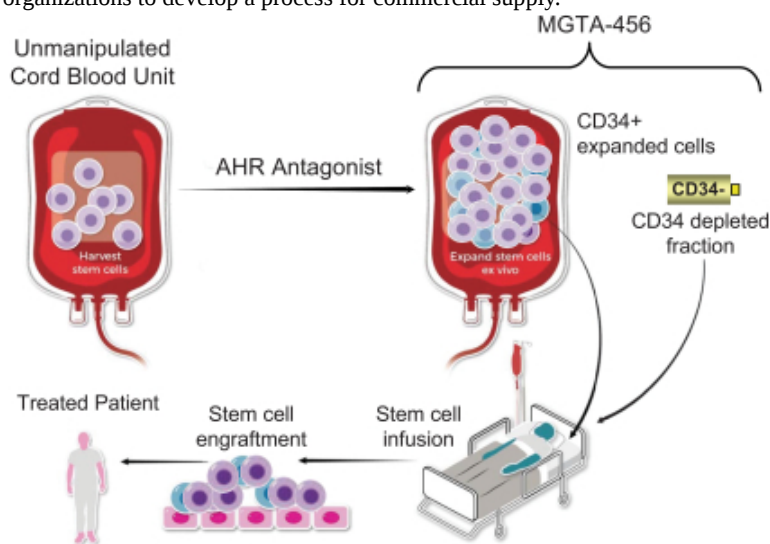
MGTA-456 is manufactured at a GMP-certified contract manufacturing facility, which has produced all batches of MGTA-456 used for clinical trials. The manufacturing process involves selection of CD34⁺ cells which contain the stem cells, from an umbilical cord blood unit matched to the patient to create a CD34-enriched cell fraction and a CD34-depleted cell fraction. The CD34-depleted fraction is cryopreserved following selection and later thawed and infused at the time of transplant. The CD34-depleted fraction contains immune cells that are important for immune recovery and provide a source of donor T cells that can recognize and kill residual tumor cells in the patient when used in patients with blood cancers. The CD34⁺ enriched cells are cultured for 15 days with growth factors that promote cell division and the low molecular weight AHR antagonist to produce

MGTA-456. While the cells are being cultured, the patient is conditioned for transplant. The MGTA-456 manufacturing process results in a median increase in the number of CD34⁺ cells of 327-fold (range: 67-fold to 848-fold) across all studies.



Summary of clinical manufacturing of MGTA-456, CD34⁺ cell numbers before and after expansion in 36 clinical manufacturing batches

After culture, the cells are washed, characterized, and re-suspended in human serum albumin solution. The cells then undergo quality and release testing. MGTA-456 can then be infused directly into the recipient (“fresh” product) or can be mixed with cryopreservation medium, cryopreserved and infused to the patient after thawing. The ability to cryopreserve MGTA-456 should allow for shipment of the product globally. The manufacturing process takes a total of 15 days from receipt of the cord blood unit to product release. The shelf life of the fresh product is 24 hours after manufacturing. The shelf life of the frozen product is up to 90 days. We are currently working with third-party GMP suppliers for our clinical manufacturing process and with commercial contract manufacturing organizations to develop a process for commercial supply.



Schematic of the MGTA-456 manufacturing process. The cord blood unit is thawed and the CD34⁺ cells are selected and expanded in the presence of an AHR antagonist. Following expansion, the CD34⁺ cells are infused followed by the CD34-depleted fraction. The HSCs migrate to the bone marrow and rebuild the blood system.

The manufacturing process for MGTA-456 does not require genomic manipulation. The small molecule AHR antagonist used in the MGTA-456 manufacturing process is manufactured under GMP conditions from readily available starting materials in reliable and reproducible synthetic processes that do not require specialized equipment in the manufacturing process.

Clinical development plan

The rapid, robust and consistent engraftment of MGTA-456 in patients with blood cancers suggests that MGTA-456 may also improve engraftment in other patients in whom engraftment failure is a problem. For example, one group of diseases where cord blood transplant is curative is inherited metabolic diseases, specifically, Hurler's syndrome (also referred to as mucopolysaccharidosis-1H or MPS-1H), cerebral adrenoleukodystrophy, metachromatic leukodystrophy and globoid cell leukodystrophy (also referred to as Krabbe disease). Although some of these diseases can be treated with enzyme replacement therapy, this treatment does not halt neurocognitive decline. In contrast, transplant can be curative in these diseases and prevent neurocognitive decline. However, up to 20% of inherited metabolic diseases patients treated with transplant experience engraftment failure, resulting in severe complications, including death. We believe the high number of HSCs present in MGTA-456 will speed engraftment, reduce or eliminate engraftment failure and improve patient outcomes.

According to the National Organization for Rare Disorders, there are currently approximately 270 inherited metabolic diseases patients diagnosed each year in the U.S. and Europe. Allogeneic bone marrow transplant is the standard of care for inherited metabolic diseases patients – approximately 65% of inherited metabolic diseases patients are treated with a bone marrow transplant and many receive a cord blood transplant. Cord blood transplant volumes for these patients are currently increasing, and additional growth is expected with the adoption of newborn screening and earlier diagnosis for cerebral adrenoleukodystrophy.

In December 2017, we initiated a Phase II study of MGTA-456 in patients with inherited metabolic diseases. The Phase II trial is a single-arm, open-label study designed to evaluate the safety and efficacy of MGTA-456 after myeloablative conditioning in 12 patients with inherited metabolic diseases undergoing bone marrow transplant. The primary endpoint of this study is the incidence of neutrophil engraftment by day 42. In February 2018, we treated the first patient with MGTA-456 in our Phase II study in inherited metabolic diseases.

We anticipate reporting initial data from this study at a major medical meeting in late 2018, and will continue to provide updates on our studies at major medical meetings. If the results from this trial are favorable, we plan to treat additional patients in a registration-enabling trial focused on transplant endpoints, including engraftment neutrophil and platelet recovery and hospitalization time.

On April 11, 2018, we received orphan drug designation from the FDA for MGTA-456 for the enhancement of cell engraftment in patients receiving bone marrow transplant. In addition, we expect to focus on obtaining regenerative medicine advanced therapy, or RMAT, designation, accelerated approval for inherited metabolic diseases and eventually obtain a broad allogeneic cord label.

We intend to study MGTA-456 in other conditions where we believe it may bring transformative benefit to patients. We intend to continue to explore MGTA-456 in patients with blood cancers who could benefit from a well-matched stem cell transplant with a high dose of cells. We are in discussions with physician groups and regulatory agencies on the ideal endpoints and comparator treatments to enable clinical trial(s), which could lead to registration. We currently expect an investigator-initiated trial to begin in the second half of 2018.

Bone marrow transplant is widely accepted as a curative option for patients with sickle cell disease; however, very few patients are able to find a suitable matched donor or cord blood unit. MGTA-456 may offer the possibility for more patients with sickle cell disease to have access to transplant with high numbers of stem cells from a matched cord blood unit and we intend to initiate a Phase II study in patients with sickle cell disease in early 2019.

Stem cell expansion program: gene-modified HSCs

Unmet need

Bone marrow transplant with gene-modified HSCs, which is referred to as stem cell gene therapy or genome editing, is a promising treatment approach for a number of inherited diseases but is currently limited by the inability to generate a sufficient dose of gene-modified HSCs to achieve clinically meaningful results.

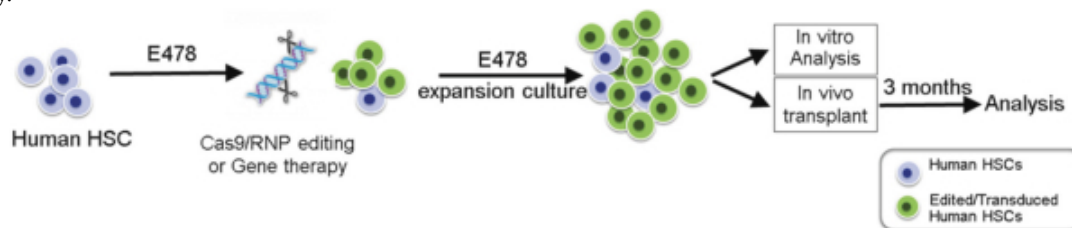
The ability to expand HSCs *ex vivo* has the potential to improve outcomes with gene therapy or genome editing by increasing the dose of genetically modified stem cells. This has been a long-term goal of the field and has the potential to reduce manufacturing costs for these therapies by requiring less viral vector for gene modification of the stem cells. Scaling up vector manufacturing in a cost-effective manner has been a significant challenge for HSC-based gene therapy companies and a significant cost driver. Such cost and capacity issues could limit the commercial viability and widespread deployment of gene therapies. This will only be a bigger challenge as more gene therapies enter the marketplace in the coming years.

Our solution

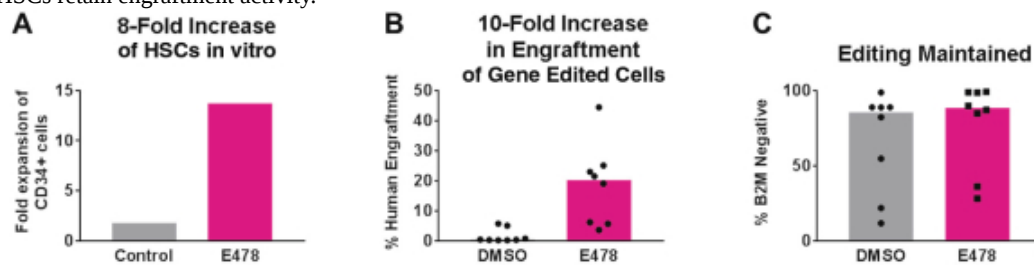
We developed the E478 program in response to an unmet technological need recognized in the field of gene therapy – the challenge of achieving sufficiently high doses of transduced or gene-modified cells. We believe that E478 could represent a key component for unlocking the full value of gene therapy by providing each patient with an optimal dose of gene-modified HSCs for rapid and successful engraftment.

E478 uses the same clinically validated method as MGTA-456, AHR antagonism, to expand HSCs. We are developing E478 specifically to partner with gene therapy and/or genome editing companies to integrate into their manufacturing processes, leading to newly defined cell therapy products.

To demonstrate the utility of E478 for increasing the dose of gene-modified human HSCs that retain engraftment activity, we performed a series of *in vitro* and *in vivo* experiments. We cultured human HSCs for 24 hours prior to gene editing using CRISPR/Cas9 or gene insertion using lentiviral vectors. Following gene modification, we cultured the cells in the presence of E478 and cytokines for seven days to increase the dose of gene-modified cells. At the end of the culture, we enumerated the number of gene-modified cells and transplanted them into immune-deficient mice. Twelve weeks following transplantation, we determined the number of gene-modified cells present to allow us measure the number of gene modified human HSC that retain engraftment activity.

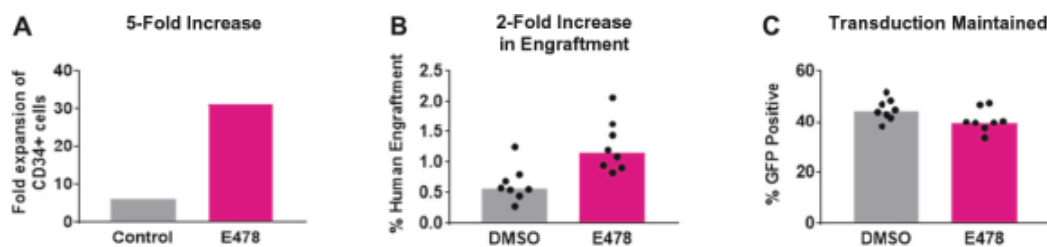


In data we presented at the ASH annual meeting in December 2017, we showed that *in vitro* culture of HSCs with E478 resulted in up to an 8-fold increase in the number of CD34⁺ cells, a cell population enriched for human HSCs. Transplant of cells expanded with E478 into immune-deficient mice resulted in a 10-fold increase in the number of human cells that engrafted *in vivo* compared to cells cultured in the absence of E478. Importantly, the high levels of editing of the expanded cells obtained during the *in vitro* culture (approximately 80%) were maintained *in vivo*, demonstrating that the expanded and edited HSCs retain engraftment activity.



Expansion and transplantation of edited bone marrow CD34⁺ cells into NSG mice: Bone marrow-derived CD34⁺ cells were thawed, edited, and expanded for seven days with (magenta bars) or without (gray bars) E478. **(A)** Fold expansion of CD34⁺ cells generated over the seven day culture. **(B)** Human engraftment and **(C)** editing rates in the bone marrow of mice as determined by flow cytometry at 16 weeks post-transplant.

We next performed similar experiments designed to evaluate the ability of E478 to increase HSC numbers for HSC based gene therapy. In these studies, human CD34⁺ cells isolated from G-CSF mobilized peripheral blood were cultured with cytokines in the presence or absence of E478 and transduced with lentiviral vectors expressing a green fluorescent protein (GFP) to identify cells that were effectively transduced. Inclusion of E478 increased the number of CD34⁺ cells and improved the level of human cell engraftment while maintaining high levels of transduction.



Expansion and transplantation of transduced peripheral blood derived CD34⁺ cells into NSG mice: Peripheral-derived CD34⁺ cells were thawed, transduced, and expanded for seven days with (magenta bars) or without (gray bars) E478. **(A)** Fold expansion of CD34⁺ cells generated over the seven-day culture. **(B)** Human engraftment and **(C)** editing rates in the peripheral blood of mice as determined by flow cytometry at four weeks post-transplant.

These data demonstrate that E478 can increase the number of gene-modified HSCs that retain the ability to engraft immune deficient mice.

Development plan

We are conducting additional preclinical studies to examine the ability of E478 to expand HSCs transduced with lentiviral vectors. We have shown that E478 can generate higher numbers of long-term engrafting cells compared to other expansion technologies. We have presented *in vitro* and *in vivo* data demonstrating successful expansion of gene-modified HSCs from both bone marrow and mobilized blood and *in vivo* engraftment of the expanded cells modified via lentiviral transduction, CRISPR/Cas9 and other gene-modifying approaches.

[Table of Contents](#)

We are developing E478 specifically to partner with gene therapy and/or genome editing companies to integrate into their manufacturing processes, leading to newly defined cell therapy products.

Post-transplant complications programs

Unmet need

Approximately 40% of all bone marrow transplants are allogeneic. GvHD, a reaction that commonly develops after an allogeneic bone marrow transplant, occurs when the transplanted cells see the recipient's body as foreign. The grafted cells then attack their new host. It is the result of the donor T cells not matching the recipient's, and this underscores the importance of HLA matching between the donor and the recipient. If they are not well matched, the donor's T cells recognize the recipient's cells as foreign and attack them. Recipients who receive poorly matched stem cells are among those at the highest risk of developing this condition. However, GvHD can occur even with proper HLA matching. Acute GvHD typically occurs within the first 100 days following transplant and can severely damage the skin, liver, and gastrointestinal system. It occurs in approximately 50 to 80% of patients receiving an allogeneic stem cell transplant, depending on the specific indication, and accounts for approximately 10% of deaths following an allogeneic transplant.

Current treatments for acute GvHD prevention include the prophylactic use of immune suppressive agents that prevent T cell activation, such as cyclosporine or tacrolimus along with mycophenolic acid, first discovered in 1893, which inhibits DNA base synthesis which is required by proliferating T cells or steroids. Despite the use of these powerful immune suppressive agents, most allogeneic transplant patients will experience GvHD. For severe cases, patients are treated with high doses of steroids, immune ablating antibodies or chemotherapy. The use of high-dose non-specific immune suppressive agents for GvHD treatment is correlated with an increased risk of opportunistic and viral infections, poor immune function and is a leading cause of death in allogeneic transplant patients.

Our solution

We are developing a unique approach to preventing acute GvHD. Our ADC-based therapeutics are designed to selectively eliminate only the components of the graft that cause acute GvHD, specifically the alloreactive T cells. This ADC therapy is intended to be dosed *in vivo* at the time of transplant and eliminate the activated alloreactive T cells. By specifically targeting the alloreactive T cells that arise shortly after transplant, this therapy should spare the remainder of the immune system to allow immune recovery and protection from opportunistic infections.

Commercialization Plan

We plan to establish sales, marketing, and commercial product distribution capabilities. Ahead of our first commercial launch, we are building upon relationships with transplant centers and thought leaders, furthering our understanding of the influences on the transplant decision-making process, refining our market research into reimbursement and market access, and leveraging our partnership with Be The Match. Transplants are currently conducted in a small number of specialist sites in the U.S. and Europe. There are approximately 170 transplant centers in the U.S. that are accredited through the National Marrow Donor Program, of which 20% of these transplant centers collectively account for over 50% of transplant volume. In Europe, approximately 205 transplant centers are accredited through the Joint Accreditation Committee ISCT-Europe-EMBT and data suggest that 30% of transplants in Europe between 2012 and 2015 were carried out by 20 centers in France and Spain. All of our product candidates are focused on the transplant physician as the key prescriber and decision maker.

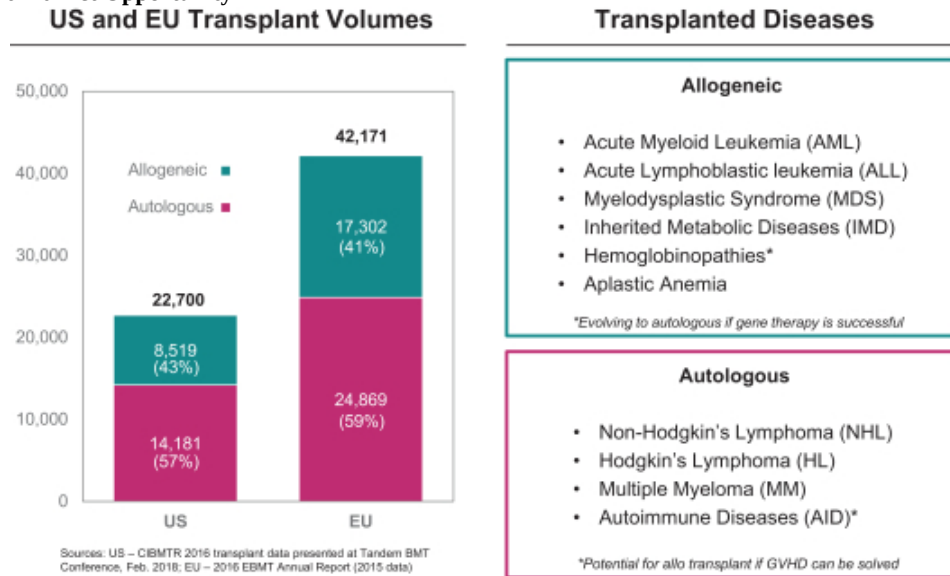
As we advance our development programs in the U.S. and Europe, we will evaluate our sales and marketing resource needs. In advance of approval of MGTA-456 in the U.S. and Europe, we plan to build out a dedicated transplant-center-focused sales and marketing organization. We intend to leverage the infrastructure developed

Table of Contents

for MGTA-456 to support commercialization of any additional product candidates in our portfolio for which we gain approval. In addition, we will build upon physicians' familiarity with MGTA-456 to accelerate adoption of our other bone marrow transplant medicines. As additional product candidates advance through our pipeline, our commercial plans may change. In particular, some of our pipeline assets target autoimmune disease indications, which could potentially require commercial reach that captures referring physicians outside of transplant centers and clinical trial sites.

Our commercial strategy may include the use of strategic partners, distributors, a contract sales force or the establishment of our own commercial structure.

Bone Marrow Transplant Market Opportunity



Bone marrow transplant as it exists today is a large market opportunity with approximately 65,000 procedures performed annually but is poorly served by the existing approaches across all steps. At Magenta, we believe our portfolio of product candidates could not only address deficiencies in existing approaches but also extend the curative power of bone marrow transplant to more patients. Each of our product candidates contributes uniquely to addressing certain unmet needs in bone marrow transplant. By using multiple Magenta products, physicians would be able to tailor the transplant procedure, thereby improving patient outcomes and increasing the potential for every eligible patient to benefit from a bone marrow transplant.

Across diseases where transplant has been shown to result in improved patient outcomes, only a small fraction of eligible patients currently receive a transplant because the risks and challenges outweigh the potential for a cure. Depending on the disease, the barriers for treatment include finding a matched donor, obtaining an adequate cell dose and the morbidity and mortality associated with current conditioning regimens.

The table below lists a number of these diseases where we believe our portfolio of products could allow more patients to benefit from a transplant.

Disease	Examples (US Based)			Examples (Europe Based)		
	Annual Incidence	HSCT-eligible*	HSCTs Performed	Annual Incidence	HSCT-eligible*	HSCTs Performed
NHL	~72K ^{1,2}	~6.5k ^{3,a}	~4,000 ⁴ (60% of eligible)	~95K ⁵	~8.5k ³	~7,500 ⁶ (88% of eligible)
MM	~30K ^{2,7}	~15k ^{7,b}	~9,000 ⁴ (60% of eligible)	~40K ⁵	~20k ^{7,b}	~11,000 ⁶ (55% of eligible)
AML	~20k ^{1,2}	~13.2k ^{8,9,c}	3,100 ¹⁰ (23% of eligible)	~27k ¹¹	~17.8k ^{8,9,c}	~6,600 ⁶ (37% of eligible)
MDS	~21k ^{1,13}	~6.7k ^{12,d}	1,100 ¹⁰ (16% of eligible)	~13.3k ^{11,13}	~4.6k ^{12,d}	~1,900 ⁶ (40% of eligible)
SCD	~1.7k ¹⁴	~400 ^{15,e}	145 ¹⁰ (36% of eligible)	~720 ¹⁴	~180 ^{15,e}	~105 ⁶ (58% of eligible)
IMD	~120 ¹⁶	~120 ^f	80 ¹⁰ (65% of eligible)	~150 ¹⁶	~150 ^f	100 ^f (65% of eligible)
MS	~15k ¹⁷	~2-4k ^{18,18,g}	4 ¹⁰ (<1% of eligible)	~32k ^{20,21}	~3-6k ^g	~85 ^{9,22,23} (~1-2% of eligible)
SSc	~6.6k ^{24,25,26}	~2.3k ^{25,h}	7 ¹⁰ (<1% of eligible)	~10.9k ²⁷	~3.8k ^{25,h}	~45 ^{9,22,23} (~1% of eligible)

Sources: 1 | NCI SEER Program; 2 | 2017 ACS Facts and Figures; 3 | Hematol Oncol Stem Cell Ther (2017), Dec; 4 | CDOTR Data, presented at Tandem 2018 Conference; 5 | CDC/NCHADS (2012 data); 6 | Bone Marrow Transplant, 2016 Jun; 5(5): 788-92 (2014 data); 7 | DataMonitor "Multiple Myeloma Epidemiology" (2016); 8 | Blood Cancer Journal volume 6, page s421 (2016); 9 | American Cancer Society "Treatment Response Rates for AML"; 10 | NRGSA 2011-2015 database; 11 | Eur J Cancer, 2012 Nov; 48(17): 3257-66; 12 | J Natl Cancer Inst, 2008; 100(21): 1542-51; 13 | Leukemia Research 2011; 35: 1591-1596; 14 | CDC MMWR December 12, 2014 / 63(49): 1155-1158; 15 | Pediatr Blood Cancer, 2014 Apr; 61(4): 697-701; 16 | NCRD database; 17 | Neurology, 2008 Jul 9; 71(2): 129-36; 18 | Biogen SQ 2616 Earnings call; 19 | National MS Society, "Types of MS"; 20 | Eur J Neurol, 2006 Jul; 13(7): 790-92; 21 | Advances in Experimental Medicine and Biology 958, Chapter 9.7, Epidemiology Europe; 22 | ESMO 2016 Annual Report; 23 | Curr Res Transl Med, 2016 Apr-Jun; 64(2): 71-82; 24 | Arthritis Rheum, 2003 Aug; 45(8): 2248-55; 25 | Am Fam Physician, 2008 Oct 15; 78(9): 961-968; 26 | Semin Arthritis Rheum, 2008 Feb; 37(4): 223-36; 27 | Curr Opin Rheumatol, 2012 Mar; 24(2): 165-170; Human Consulting Research & Analytics; Magenta Research & Analytics

*HSCT-eligible
 a) NHL: 1/3 of patients have DLCL, and 1/3 of patients are relapsed/refractory
 b) MM: for patients after primary treatment for more durable response
 c) AML: ~65% of newly diagnosed patients have a complete response to induction therapy and become eligible for transplant
 d) MDS: ~30% of newly diagnosed patients have IPSS intermediate-2 or high risk disease
 e) SCD: ~25% of patients have severe disease
 f) IMD: 100% of patients are eligible; increasing numbers of transplants with newborn screening; assume same % of HSCTs performed in EU as in US
 g) MS: ~5-10% of RRMS or relapsing SPMS patients that switch therapy are eligible irrespective of diagnosed incidence; 60,000 patients switch per year in US of which ~45% are RRMS and ~20% are relapsing SPMS; 1.5x assumption for Europe based on overall population size US vs. EU
 h) SSc: ~35% of patients have diffuse cutaneous disease

At Magenta, we are planning to develop our suite of medicines for bone marrow transplant across several indications. These include diseases where bone marrow transplant is currently a standard of care (e.g., blood cancers such as acute myelogenous leukemia, myelodysplastic syndromes, multiple myeloma, and non-Hodgkin lymphoma), diseases where transplant is performed but limited in use (e.g., hemoglobinopathies such as sickle cell disease and beta-thalassemia), and diseases where the clinical promise for bone marrow transplant is emerging (e.g., autoimmune diseases such as systemic sclerosis and multiple sclerosis). Based on the disease examples in the table above, the introduction of innovative medicines to the marketplace that address some of the barriers for treatment with transplant and therefore enable each eligible patient across these diseases to receive a transplant, and management's growth rate assumptions, we estimate that the total number of transplants performed in these indications will be approximately 120,000 by 2028 across the U.S. and Europe. Based on this projected growth in transplant volume for these diseases, we further assessed the addressable patient population on a per program basis to estimate the potential number of treatments that could be provided on a per patient basis. This analysis, summarized in the table below, assumes demonstration of clinical outcomes that address barriers to treatment with transplant.

[Table of Contents](#)

Of the approximately 120,000 estimated bone marrow transplant patients in US and Europe in approximately 10 years, each will potentially need multiple treatments using products to be developed under our programs:

Innovative HSCT Product	% of 120k Patients Who Could Benefit*	Number of Patients	Source / Rationale
Preparative Conditioning C100 C200 C300	~100%	~120k	All addressable patients need better conditioning
Mobilization 148	~30%	~40k	AID and genetic disease patients, Autologous hem/onc patients
Expansion 458 E478	~10%	~12k	All genetic disease patients (auto GT), Hem Onc where cord is used Depends on E478 potential partnerships
Post Transplant GvHD G100	~40%	~50k	~40% of transplants are allogeneic
Total Product Use		~220k Treatments	

Significant Patient Impact

*Based on internal projections
Sources: 1) 'U.S. Transplant Data by Disease Report' 2014 data; 2) EBMT Activity Survey, JR Passweg, et. al., Bone Marrow Transplantation (2016),1-7; 3.) Magenta Research & Analysis

Blood Cancers: Bone marrow transplant is a standard of care, however a significant number of eligible patients do not receive a transplant because of lack of a matched donor, poor mobilization, and the toxicity of conditioning:

Acute myeloid leukemia, or AML, a cancer arising from myeloid cells, an immature white blood cell found in the bone marrow, is diagnosed in approximately 20,000 patients in the U.S. and 27,000 patients in Europe annually. Approximately 60% (12,500 patients in the U.S., 16,400 patients in Europe) of newly diagnosed patients have a complete response to induction chemotherapy and become eligible for transplant for a more durable remission. However, the current challenges of bone marrow transplant and patient co-morbidities limit transplant to approximately 30 to 40% of those patients who are otherwise eligible.

Myelodysplastic syndromes, or MDS, occurs when the blood-forming cells in the bone marrow become abnormal, leading to low numbers of one or more types of blood cells. It is diagnosed in approximately 21,000 patients in the U.S. and 13,300 patients in Europe annually. Approximately 30% (6,700 patients in the U.S., 4,600 patients in Europe) of newly diagnosed patients have high risk disease and are eligible for bone marrow transplant. However, toxicities of bone marrow transplant and patient co-morbidities limit transplant to approximately 16 to 40% of those patients who are otherwise eligible.

Non-Hodgkin lymphoma, or NHL, a cancer arising from lymphocytes, a type of white blood cell, is diagnosed in approximately 72,000 patients in the U.S. and 95,000 patients in Europe annually. Non-Hodgkin lymphoma, the most common blood cancer, can be treated by autologous bone marrow transplant. The largest Non-Hodgkin lymphoma subtype is Diffuse Large B-Cell Lymphoma, or DLBCL, comprising approximately 33% of Non-Hodgkin lymphoma. First-line chemotherapy and targeted therapies like rituximab are effective for about two-thirds of DLBCL patients. In the remaining one-third of patients with relapsed/refractory disease, the National Comprehensive Cancer Network recommends autologous bone marrow transplant as one therapeutic option. Therefore, approximately 6,500 newly diagnosed patients in the U.S. and 8,500 patients in Europe are eligible for bone marrow transplant. Currently, approximately 60 to 80% of those eligible Non-Hodgkin lymphoma patients in the U.S. and Europe receive a bone marrow transplant.

Multiple myeloma, or MM, a cancer arising from plasma cells, is diagnosed in approximately 30,000 patients in the U.S. and 40,000 patients in Europe annually. Multiple myeloma represents the second most common blood cancer treated by autologous bone marrow transplant. Approximately 50% (15,000 patients in the U.S., 20,000 patients in Europe) of newly diagnosed patients are eligible for bone marrow transplant. The National

[Table of Contents](#)

Comprehensive Cancer Network recommends bone marrow transplant for patients after primary therapeutic treatment, including novel orals, injectables, and chemotherapy. This recommendation is founded on evidence that autologous bone marrow transplant consistently achieves higher response rates and survival rates than primary treatment alone. However, toxicities of bone marrow transplant and patient co-morbidities limit transplant to approximately 55 to 60% of those patients who are otherwise eligible.

Our conditioning programs, such as C200 and C100, have the potential to provide safer, targeted conditioning for these blood cancer patients who are too frail to tolerate the current conditioning regimens. Our MGTA-145 product candidate has the potential to address the difficult-to-mobilize patients who are suffering from blood cancers as well so that patients can access a robust single-day mobilization regimen. For allogeneic transplant recipients, MGTA-456 offers increased access to a well-matched cord blood unit, with a high cell dose and the higher likelihood of durable clinical outcomes.

Hemoglobinopathies: Bone marrow transplant is clinically accepted but still limited in use due to challenges identifying well-matched donors and conditioning-associated morbidity and mortality. Gene therapy is a promising treatment option but is limited by the same conditioning challenges as well as the ability to obtain a sufficient dose of gene-modified cells.

Sickle cell disease, or SCD, is diagnosed in approximately 1,700 patients in the U.S. and 720 patients in Europe annually. Approximately 25% (400 patients in the U.S., 180 patients in Europe) of patients with sickle cell disease have severe disease and are therefore eligible for bone marrow transplant. Currently, only approximately 36 to 58% of eligible patients with sickle cell disease in the U.S. and Europe receive a bone marrow transplant because it is particularly difficult to find a matched donor and the risk of the procedure often outweighs the benefits of a potential cure.

Beta-thalassemia is diagnosed in approximately 500 patients in the U.S. and 1,500 patients in Europe annually. Approximately 60% (340 patients in the U.S., 1,020 patients in Europe) of patients with beta-thalassemia patients have severe disease, or beta-thalassemia major, and are therefore eligible for bone marrow transplant. Currently, only approximately 27% of eligible beta-thalassemia patients in the U.S. and Europe receive a bone marrow transplant because they are unable to find a matched donor and/or the risk of the process outweighs the benefits of a potential cure.

Our conditioning programs, such as C200, have the potential to provide safer, targeted conditioning for these hemoglobinopathy patients receiving autologous gene therapy or an allogeneic transplant. Our MGTA-145 product candidate has the potential to address patients with sickle cell disease who cannot receive G-CSF because of the risk of triggering sickle cell crises. For the allogeneic transplant recipients, MGTA-456 has the potential to offer higher likelihood of identifying and accessing a well-matched cord blood with a high cell dose, both of which are associated with a higher chance of durable clinical outcomes. E478 uses the same clinically-validated mechanism as MGTA-456 to generate higher doses of gene-modified stem cells.

Autoimmune diseases: emerging data support use of bone marrow transplant as a clinically promising one-time therapy, however the high morbidity and mortality associated with current conditioning regimens limit the uptake of transplant as a therapeutic option.

Multiple sclerosis, or MS, is diagnosed in approximately 15,000 patients in the U.S. and 32,000 patients in Europe annually. To assess eligibility in this population we focused on the patients with active relapsing-remitting disease and relapsing secondary progressive multiple sclerosis patients who are not adequately treated by current therapies. This population represents approximately 45,000 multiple sclerosis patients who switch therapies each year in the U.S. and we believe that a greater population of patients switch therapies each year in Europe. Many of these patients switch because their current therapy does not adequately control disease activity such as relapses. Given bone marrow transplant's ability to durably eliminate relapses and disease activity in multiple sclerosis patients, we believe a safer transplant procedure would be a viable option for those patients

with highly active disease beyond what therapeutics can manage. Currently approximately 1 to 2% of eligible multiple sclerosis patients in the U.S. and EU receive a bone marrow transplant because the risk of the process outweighs the benefits of a potential cure and we believe we can significantly expand this number.

Scleroderma, a chronic connective tissue disease that is characterized by thickening of the skin, is diagnosed in approximately 6,600 patients in the U.S. and 10,900 patients in Europe annually. Approximately 35% (2,300 patients in the U.S., 3,800 patients in Europe) of scleroderma patients suffer from diffuse cutaneous disease and are therefore eligible for bone marrow transplant. Currently approximately 1% or less of eligible scleroderma patients in the U.S. and Europe receive a bone marrow transplant. However with the addition of bone marrow transplant into the EULAR, treatment guidelines for scleroderma and with the opportunity for a safer transplant procedure, we believe transplant would be a viable option for the severe scleroderma patient population who have no other therapeutic options available.

Our conditioning programs, such as C100 or a combination of C200 and C300, have the potential to provide safer, targeted conditioning for these autoimmune disease patients receiving autologous transplant. We are developing these targeted conditioning approaches to grow the use of transplant in autoimmune disease significantly. In addition, our MGTA-145 product candidate may address the difficult-to-mobilize patients who cannot receive G-CSF because of the risk of triggering autoimmune flares.

Our portfolio of products is designed to address several unmet needs in transplant, providing the potential opportunity for our products to be used in combination to create disease-tailored solutions for patients. Based on the projected growth in transplant volume of 120,000 transplants for the U.S. and Europe above, and management assumptions, we estimate that, by 2028 the approximately 120,000 bone marrow transplant patients could be treated by around 220,000 aggregate treatments per year. This estimate includes approximately 120,000 treatments under our conditioning programs, 40,000 treatments under our mobilization program, 12,000 treatments under our expansion programs, and 50,000 treatments under our post-transplant complications program, each on an annual basis. Therefore, in 2028 an estimated 1.8 products could be used on a per patient basis annually.

Competition

The biotechnology industry is extremely competitive in the race to develop new products and treatment modalities. While we believe we have significant competitive advantages with our industry-leading expertise in transplant medicine, preclinical and clinical development expertise, our comprehensive approach to patient care and intellectual property position, we may face competition for our development programs from companies focused on traditional therapeutic modalities, such as small molecules and antibodies, as well as companies developing next-generation cell therapies. Competition is likely to come from multiple sources, including larger pharmaceutical companies, biotechnology companies and academia. For any products that we may ultimately commercialize, not only will we compete with any existing therapies and those therapies currently in development, we will have to compete with new therapies that may become available in the future. We believe we are the only company that is committed to addressing all of the major limitations and challenges of bone marrow transplant to revolutionize an entire field of medicine. We are building a comprehensive portfolio of novel therapeutic development programs to address all major unmet medical needs inherent to the existing bone marrow transplant process, which distinguishes us from our competition.

Many of our competitors may have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, clinical trials, regulatory approvals and product marketing than we currently do. These competitors also compete with us in recruiting and retaining qualified scientific and management personnel and establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to, or necessary for, our programs. Mergers and acquisitions in the pharmaceutical and biotechnology industries may result in even more resources being concentrated among a smaller number of our competitors. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies.

[Table of Contents](#)

Bone marrow transplant is used to treat a number of diseases and indications. We are aware of a number of companies that are developing therapeutics, including biologics, small molecules and CAR T therapies that are directed to the treatment of autoimmunity, blood cancers, and genetic diseases that overlap with certain current bone marrow transplant indications. The following competitive overview is focused on companies that are developing technologies to improve the distinct steps of bone marrow transplant.

Competitors in our stem cell expansion programs include the following:

- Gamida Cell Ltd., which is developing a UCB-derived cell product that uses a small molecule to inhibit differentiation and enhance functionality of *ex vivo*-expanded HSCs;
- Nohla Therapeutics, Inc., which is developing a method of *ex vivo* expansion of cord blood stem/progenitor cells resulting in “off-the-shelf” universal donor cellular therapies;
- ExCellThera Inc., which is focused on *ex vivo* expansion of stem cells using a pyrimidoindole-derivative small molecule;
- Angiocrine Bioscience, Inc., which is expanding cord blood and gene-modified HSCs using an endothelial cell feeder layer; and
- Intellia Therapeutics, Inc., which has exclusively licensed from Novartis the AHR antagonist that we use to manufacture MGTA-456 for expansion of gene-modified HSCs only.

Competitors in our conditioning programs include the following:

- Actinium Pharmaceuticals, Inc., which is developing an antibody to CD45 that is linked to radioisotope iodine-131;
- Stanford University, which is developing an antibody to CD117 that is not conjugated to any toxin;
- Forty Seven, Inc., which is developing an antibody to CD117 that is not conjugated to any toxin; and
- Molecular Templates Inc., which is developing an antibody to CD45 that is conjugated to engineered Shiga-toxin.

Competitors in our post-transplant complications programs (acute GvHD) include the following:

- Bellicum Pharmaceuticals, Inc., which is developing a combination of genetically modified T cells and activator agent rimiducid;
- Kiadis Pharma NV, which is developing a single dose donor lymphocyte infusion with functional, mature immune cells from a partially matched family member; and
- Abbvie Inc., which has a Bruton’s tyrosine kinase (BTK) inhibitor that is approved for use in chronic GvHD.

Competitors in our mobilization programs include the following:

- BioLineRx Ltd., which is developing BL-8040, a peptide that functions as a high-affinity antagonist for CXCR4.

Manufacturing

We do not own or operate, and currently have no plans to establish, any manufacturing facilities. We currently depend on third-party contract manufacturing organizations, or CMOs, for all of our requirements of raw materials, drug substance and drug product for our preclinical research and our ongoing clinical trial of MGTA-456. We have not entered into long-term agreements with our current CMOs. We intend to continue to rely on CMOs for later-stage development and commercialization of MGTA-456, as well as the development and

commercialization of any other product candidates that we may identify. Although we rely on CMOs, we have personnel and consultants with extensive manufacturing experience to oversee the relationships with our contract manufacturers.

We believe the synthesis of the AHR antagonist that we use to manufacture MGTA-456 is reliable and reproducible from readily available starting materials, and the synthetic routes are amenable to large-scale production and do not require unusual equipment or handling in the manufacturing process. We acquired data from Novartis related to the chemical synthesis of the AHR antagonist, which has been manufactured by Novartis to satisfy our immediate and near term clinical and preclinical needs. We also acquired data from Novartis related to manufacturing of MGTA-456, which is currently manufactured by a single CMO to satisfy our immediate and near term clinical and pre-commercial needs. Drug product formulation optimization work for MGTA-456 is also in progress with this CMO. We have begun to engage with a second drug product manufacturer for our commercial supply needs for MGTA-456.

Our manufacturing strategy enables us to more efficiently direct financial resources to the research, development, and commercialization of product candidates rather than diverting resources to internally develop manufacturing facilities. As our product candidates advance through development and commercialization, we expect to enter into longer-term commercial supply agreements with key suppliers and manufacturers to fulfill and secure the ongoing and planned preclinical, clinical, and, if our product candidates are approved for marketing, commercial supply needs for ourselves and our collaborators.

Manufacturing of any product candidate is subject to extensive regulations that impose various procedural and documentation requirements, which govern recordkeeping, manufacturing processes and controls, personnel, quality control and quality assurance, among others. We expect that all of our CMOs will manufacture MGTA-456 under current Good Manufacturing Practice, or cGMP, conditions. cGMP is a regulatory standard for the production of pharmaceuticals to be used in humans.

Licenses and Collaborations

Alliance with Novartis

In April 2017, we entered into a license agreement with Novartis International Pharmaceutical Ltd., or Novartis, pursuant to which Novartis granted us an exclusive, worldwide, sublicensable license to research, develop and commercialize certain licensed products that contain Novartis compounds for the expansion of cord blood derived non-Gene-Edited/-Modified HSCs. We refer to this agreement as the Novartis Agreement. The license granted to us under the Novartis Agreement is subject to certain rights retained by Novartis for internal research purposes and certain third parties for research and educational purposes. Certain of the rights licensed to us under the Novartis Agreement are also subject to any retained rights of the U.S. government in the licensed patents. The Novartis Agreement led to the establishment of MGTA-456 as one of our programs. Under the terms of the Novartis Agreement, we are responsible for all research, development, regulatory and commercialization activities related to licensed products. We are required to use commercially reasonable efforts to develop and commercialize licensed products in the U.S., United Kingdom, France, Germany, Spain, Italy and Japan.

Pursuant to the Novartis Agreement, we issued to Novartis 2,500,000 shares of Series A preferred stock and 643,550 shares of Series B preferred stock. We will be required to make milestone payments to Novartis upon dosing the first patient in BLA-enabling clinical trials and upon regulatory approvals of licensed products across ultra-orphan, hemoglobinopathies and other indications. For ultra-orphan indications, we may be required to pay development and regulatory milestones of up to \$13.0 million for each of the first two indications, and up to \$5.0 million for a third indication. For hemoglobinopathies, we may be required to pay development and regulatory milestones of up to \$13.0 million per indication, for the first two indications. For all other indications that are not an ultra-orphan or hemoglobinopathy, we may be required to pay development and regulatory milestones of up to \$75.0 million for the first indication and up to \$45.0 million for the second indication. Across

all licensed products, we may be required to pay Novartis up to \$125.0 million in sales milestones, based on the first achievement of certain aggregate worldwide annual net sales thresholds. We are also required to pay tiered royalties to Novartis on worldwide net sales of licensed products by us, ranging from low single-digit percentages to up to 20% for higher net sales, which royalties are potentially subject to reduction and offset during the royalty term. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the later of (i) expiration of the last valid claim of a licensed patent right that covers the manufacture, use or sale of such licensed product, or the licensed compound used in the manufacture of such licensed product, in such country and (ii) ten years following the first commercial sale of such licensed product in such country.

Novartis controls the filing, prosecution, maintenance and enforcement of the licensed patent rights at its expense. We have the right to assume these responsibilities should Novartis not wish to pursue them. We own all rights in any intellectual property related to the licensed compound or licensed products that we solely develop under the Novartis Agreement. The Novartis Agreement does not otherwise allocate ownership of improvements developed thereunder; however, Novartis grants us a non-exclusive, royalty-free license to practice any improvements that Novartis owns under the Novartis Agreement in connection with non-gene-edited/-modified HSCs, and we grant a non-exclusive, royalty-free license to Novartis to practice any improvements that we own under the agreement outside of such field.

The Novartis Agreement will continue until the last-to-expire royalty term for a licensed product unless terminated earlier by either party. Each party may terminate the Novartis Agreement due to the other party's insolvency or uncured breach of a material obligation. We have the right to terminate the Novartis Agreement in its entirety or on a product-by-product or country-by-country basis for convenience upon 90 days' prior written notice to Novartis. Upon termination of the Novartis Agreement by us for convenience or by Novartis for cause, the license granted to us by Novartis will terminate and we will grant a worldwide, perpetual, non-exclusive license to Novartis to develop and commercialize the licensed products under any intellectual property that we (i) control and used in the development, manufacture or commercialization of licensed products or (ii) developed under the agreement to develop and commercialize the licensed products.

Collaboration with Be The Match BioTherapies

In November 2017, we formalized a collaboration agreement with Be The Match BioTherapies, or BTMB, which we refer to as the BTMB Agreement, to advance our relationship developed under a Memorandum of Understanding executed in April 2017. Pursuant to the BTMB Agreement, BTMB grants us priority access to subject matter experts at the National Marrow Donor Program/Be The Match, or NMDP/BTM, the Center for International Blood and Marrow Transplant Research, or CIBMTR, which is an affiliation between the Medical College of Wisconsin and NMDP/BTM, and BTMB for consultation on our clinical development and commercialization needs. The parties may enter into additional riders to the BTMB Agreement from time to time to expand the services that BTMB provides thereunder.

We believe that, through this priority access, the partnership enables us to establish relationships across transplant centers and with transplant physicians, giving us access to clinical strategy and development operational support, and potentially supporting our eventual commercialization efforts across several programs.

Under the BMTB Agreement, we will make quarterly payments to BTMB of \$70,000. The parties will renegotiate this amount in good faith after 12 months, if either party believes such fee is not reflective of the services performed. The term of the BTMB Agreement will continue until December 31, 2020 unless terminated earlier by either party. Either party may terminate the BTMB Agreement in whole or in part (i) for convenience upon 60 days' notice, (ii) for the other party's uncured material breach upon ten days' notice or (iii) upon the other party's insolvency.



Harvard University License Agreement

In November 2016, we entered into a license agreement with Harvard University, or Harvard, pursuant to which Harvard granted us the worldwide exclusive, subject to Harvard's retained right solely for research and educational purposes, sublicensable, right, to research, develop and commercialize licensed products under certain conditioning-related and mobilization-related patents. The license granted to us under the Harvard Agreement is also subject to any retained rights of the U.S. government in the licensed patents. Under the terms of the agreement, which we refer to as the Harvard Agreement, we will be responsible for all research, development, regulatory and commercialization activities related to licensed products. We are obligated to use commercially reasonable efforts to commercialize at least two licensed products under the Harvard Agreement, including one for conditioning and one for mobilization. The license from the Harvard Agreement relates to our C100, C200 and mobilization programs.

Pursuant to the Harvard Agreement, we made an upfront payment to Harvard of \$85,000 and issued to Harvard and the other co-owners of the licensed patent rights (The General Hospital Corporation d/b/a Massachusetts General Hospital, and Children's Medical Center Corporation) 995,000 shares of our common stock. In addition, we reimbursed Harvard for approximately \$300,000 in expenses incurred by Harvard in connection with the licensed patent rights. Harvard is also entitled to receive an annual license maintenance fee of \$25,000 for each calendar year through 2019 and \$50,000 for each calendar year thereafter until expiration or termination of the Harvard Agreement.

Harvard is entitled to payments upon certain development and regulatory milestones for the first two licensed products of up to \$7.4 million per licensed product. In addition, we must pay Harvard low-single digit royalties on net sales of licensed products. If we or our affiliates or sublicensees under the Harvard Agreement commence a legal action to challenge the validity, enforceability or scope of any licensed patents, the royalty rate payable to Harvard will double during the pendency of such proceeding and will remain double thereafter if such action is determined in Harvard's favor. Depending on the type of licensed product, royalties are payable on a product-by-product and country-by-country basis until the later of (i) the last to expire valid claim in the applicable country covering or claiming the composition, manufacture, sale or use of such licensed product and (ii) 12 years from the date of the first commercial sale of such licensed product in such country.

[Table of Contents](#)

Harvard controls the filing, prosecution and maintenance of the licensed patent rights at our expense. We have the first right, but not the obligation, to enforce licensed patent rights against third-party infringement.

The term of the Harvard Agreement will continue until the later of (i) the expiration of the last to expire valid claim under a licensed patent, and (ii) the expiration of the last royalty period. Each party has the right to terminate the Harvard Agreement due to the other party's uncured material breach or insolvency. In particular, Harvard may terminate the Harvard Agreement upon our uncured failure to meet certain development and regulatory milestone deadlines set forth therein. We have the right to terminate the Harvard Agreement for convenience upon 60 days' prior written notice to Harvard. Upon termination of the Harvard Agreement for any reason, the license granted to us by Harvard will terminate.

Research, Development Option and License Agreement with Heidelberg Pharma Research GmbH

In March 2018, we entered into an exclusive research, development option and license agreement with Heidelberg Pharma Research GmbH, or Heidelberg Pharma. We refer to this agreement as the Heidelberg Agreement. Heidelberg Pharma has developed a proprietary antibody targeted amanitin conjugates platform. This collaboration enables our research and development efforts across several targeted conditioning programs through the combination of our proprietary antibodies and Heidelberg Pharma's antibody targeted amanitin conjugates platform.

Under the terms of the Heidelberg Agreement, Heidelberg Pharma has granted to us a worldwide, non-exclusive research license for a one-year period with respect to certain targets set forth in an agreed-to research plan. We have the option to extend such license for up to an additional three years and also have an option to obtain an exclusive target-specific research license, which would expire two years after the exercise of such option. We have exercised this option for two initial targets with signature of the Heidelberg Agreement. In addition, we will have an option to obtain a target-specific exclusive license for global development and commercialization rights to each of the product candidates resulting from the research collaboration. We may obtain such exclusive target-specific rights to up to four targets. We are required to use commercially reasonable efforts to perform our research activities under the Heidelberg Agreement and, if we exercise our right to obtain a development and commercialization license, we are required to use commercially reasonable efforts to pursue development and commercialization of a product directed to the applicable target.

Under the terms of the Heidelberg Agreement, we granted Heidelberg Pharma a worldwide, non-exclusive license under all of our patents and know-how, and any improvements of the foregoing developed under the Heidelberg Agreement, that are reasonably necessary or useful for Heidelberg Pharma to perform its research activities under the Heidelberg Agreement. In addition, we grant Heidelberg Pharma a worldwide, royalty-free, non-exclusive license under all joint improvements developed under the Heidelberg Agreement for non-clinical research purposes only.

Payment terms to Heidelberg Pharma include an upfront technology access fee, research exclusivity fees with respect to the two initial targets, and payments for research support. Heidelberg Pharma will be entitled to additional fees if we extend the initial research license or if we exercise our research exclusivity options with respect to additional targets. Upon our exercise of an option for an exclusive development and commercialization license, with respect to a target, we are required to make a low single digit million dollar payment to Heidelberg Pharma for each exercised option. In addition, on a per target basis, we may be required to pay development, regulatory and commercial milestones totaling up to approximately \$83.5 million per target. We will pay Heidelberg Pharma mid-single digit royalties on a country-by-country and product-by-product basis, on worldwide net product sales of licensed products. Royalties are payable on a licensed product-by-licensed product and country-by-country basis until the later of (i) expiration of the last valid claim of a licensed patent right that covers the use, import, offering for sale, or sale of such licensed product in such country, and (ii) ten years following the first commercial sale of such licensed product in such country. We have the option to buy-down royalties at certain points during the development path of each product.

[Table of Contents](#)

Heidelberg Pharma will own all improvements solely related to the intellectual property rights Heidelberg Pharma licensed to us under the Heidelberg Agreement. We will own all improvements solely related to the intellectual property rights that we licensed to Heidelberg Pharma and all other intellectual property rights developed under the Heidelberg Agreement for which ownership is not otherwise allocated.

Heidelberg Pharma controls the filing, prosecution, maintenance and enforcement of the intellectual property that it licenses to us under the Heidelberg Agreement. We have the right to enforce such licensed intellectual property against infringement if the infringement is competitive with our licensed products and Heidelberg Pharma does not pursue enforcement. We control the filing, prosecution, maintenance and enforcement of the intellectual property we license to Heidelberg Pharma under the Heidelberg Agreement.

The term of the Heidelberg Agreement will continue until the last to expire royalty term unless terminated earlier by either party. Each party has the right to terminate the Heidelberg Pharma Agreement due to the other party's uncured material breach or insolvency on a product-by-product or target-by-target basis. We have the right to terminate the Heidelberg Agreement for convenience in its entirety or on a product-by-product, target-by-target or country-by-country basis upon 60 days' prior written notice to Heidelberg Pharma if terminating before the first commercial sale of a product in a country or upon six months' prior written notice to Heidelberg Pharma if terminating after the first commercial sale of any product directed to such target in such country.

Upon termination of the Heidelberg Agreement in its entirety or with respect to a product or target, all applicable licenses granted to us will terminate immediately.

Bachem Master Development and Manufacturing Agreement

In February 2018, we entered into a Master Development and Manufacturing Agreement with Bachem Americas, Inc., or Bachem. This agreement, which we refer to as the Bachem Agreement, governs several projects related to the development and manufacture of CXCR2 agonists, including MGTA-145, each pursuant to a separate project plan. The active pharmaceutical ingredient of MGTA-145 is a 69 amino acid protein. We selected Bachem as our contract manufacturer for this program based on their deep expertise in the synthesis and production of proteins. Financial terms related to this agreement will be determined on a project-by-project basis. In April 2018, we entered into an initial one year project plan pursuant to which Bachem will be responsible for producing batches of MGTA-145 for GLP toxicology studies expected to be completed in 2018, as well as GMP material for the Phase I study of MGTA-145, which is expected to commence in the first quarter of 2019.

The term of the Bachem Agreement is initially five years and will be automatically renewed for one-year periods unless either party provides the other with written notice of nonrenewal at least three months prior to expiry. Each party may terminate the agreement upon a material uncured breach of the other party. During the term, Bachem will be restricted from producing a pre-defined set of agonists, including MGTA-145, for clinical or commercial use by any third party without our prior written consent, as long as Bachem remains our primary supplier of CXCR2 agonists. Each project plan may be terminated independently of the agreement as a whole.

Clinical Trial Agreement with University of Minnesota

In January 2018, we entered into a Clinical Trial Agreement with the Regents of the University of Minnesota, or UMinn, pursuant to which UMinn will undertake a Phase II clinical trial with MGTA-456 for the treatment of inherited metabolic diseases. Under this agreement, UMinn is also responsible for the manufacture and supply of the required quantities of MGTA-456 for the trial, subject to specified quality assurance provisions. The term of the agreement will run through the course of the trial, unless earlier terminated. Each party may terminate the agreement immediately upon the other party's material failure to follow the specified protocol for the trial or upon a material uncured breach by the other party.

Intellectual Property

Overview

We strive to protect the proprietary product candidates and technologies that we believe are important to our business, including seeking and maintaining patent protection intended to cover the composition of matter of our product candidates, their methods of use, related technologies, diagnostics and other inventions. As of April 30, 2018, our owned patent portfolio is composed of one Australian patent and approximately 14 pending U.S. and foreign patent applications and more than 45 pending U.S. provisional patent applications. In addition, we have licensed more than 150 patents and pending patent applications in the U.S. and foreign jurisdictions.

Patent Rights Relating to Our Targeted Conditioning Program

Our C200 patent portfolio includes two patent families that we own. As of April 30, 2018, the first family, directed to compositions and methods for the depletion of CD117+ cells, includes one granted Australian patent, a pending Patent Cooperation Treaty, or PCT, patent application, and pending patent applications in the U.S. and Australia. Any patents that grant in this first family would be expected to expire in 2037, absent any applicable patent term extensions. As of April 30, 2018, the second family, directed to compositions and methods for the depletion of CD117+ cells, includes approximately 35 pending U.S. provisional patent applications. Any patents that grant from applications claiming priority to these provisional applications would be expected to expire in 2038, absent any applicable patent term extensions.

As of April 30, 2018, our C100 patent portfolio includes one patent family, directed to compositions and methods for the depletion of cells, that we own and consists of a pending PCT patent application and a pending patent application in Australia. Any patents that grant from this family would be expected to expire in 2037, absent any applicable patent term extensions.

As of April 30, 2018, our C300 patent portfolio includes one patent family, directed to compositions and methods for the depletion of cells, that we own and consists of one U.S. provisional patent application. Any patents that grant from applications claiming priority to this provisional application would be expected to expire in 2038, absent any applicable patent term extensions.

In addition, we have licensed two patent families from Harvard directed to compositions and methods for non-myeloablative conditioning. As of April 30, 2018, these families include one pending U.S. patent application and more than ten pending patent applications in foreign jurisdictions. Any patents that grant from these families would be expected to expire between 2036 and 2037, absent any applicable patent term extensions.

We have also licensed patent rights from Heidelberg Pharma that include four patent families directed to amatotoxin conjugates, methods of treatment, and methods of synthesizing amatotoxins. As of April 30, 2018, these families include more than 70 granted patents and pending patent applications in jurisdictions worldwide. Any patents that grant from these families would be expected to expire between 2030 and 2037, absent any applicable patent term extensions.

Patent Rights Relating to Our Stem Cell Mobilization Program

We own two patent families directed to methods of mobilizing HSCs. As of April 30, 2018, each of these families includes at least one pending U.S. provisional patent application, and any patents that grant from applications claiming priority to the provisional applications in these families would be expected to expire between 2037 and 2038, absent any applicable patent term extensions.

In addition, we have licensed two patent families from Harvard. As of April 30, 2018, the first family, directed to methods and compositions for mobilizing HSCs, includes one pending U.S. patent application and eight pending patent applications in foreign jurisdictions. Any patents that grant from this family would be expected to expire

[Table of Contents](#)

in 2034, absent any applicable patent term extensions. As of April 30, 2018, the second family, directed to highly engraftable hematopoietic stem cells, includes a pending PCT patent application. Any patents that grant from this family would be expected to expire in 2037, absent any applicable patent term extensions.

Patent Rights Relating to Our Stem Cell Expansion Program

With regard to our clinical candidate, MGTA-456, we have licensed one patent family from Novartis directed to AHR antagonists and their use in the expansion of HSCs. As of April 30, 2018, this family includes two issued U.S. patents, one with method claims covering the use of AHR antagonists in the expansion of HSCs and one with composition of matter claims covering AHR antagonists, one pending U.S. patent application, and more than 50 granted patents and pending patent applications in jurisdictions worldwide. The issued U.S. patents are expected to expire in 2032 and 2031, respectively, absent any applicable patent term extensions. The granted foreign patents and any patents that may grant from U.S. and foreign pending patent applications in this family would be expected to expire in 2029, absent any applicable patent term extensions.

Our E478 patent portfolio includes two patent families that we own. As of April 30, 2018, the first family includes two pending U.S. provisional patent applications, a pending PCT patent application and a pending patent application in each of the U.S., Argentina and Taiwan with composition of matter claims covering E478. Any patents that grant from this family would be expected to expire in 2038, absent any applicable patent term extensions. As of April 30, 2018, the second family includes five pending U.S. provisional patent applications with method claims covering expansion of gene-edited HSCs. Any patents that grant from applications claiming priority to the U.S. provisional patent applications in this family would be expected to expire in 2038, absent any applicable patent term extensions.

We also own two patent families directed to methods of treatment that are applicable to both our MGTA-456 and E478 programs. As of April 30, 2018 each of these families includes at least one pending U.S. provisional patent application, and any patents that grant from applications claiming priority to the U.S. provisional patent applications in these families would be expected to expire in 2038, absent any applicable patent term extensions.

Patent Rights Relating to Our GvHD Program

We own three patent families directed to compositions and methods for treating GvHD. As of April 30, 2018, the first family includes a pending PCT patent application and three pending patent applications in the U.S., Argentina, and Taiwan. Any patents that grant in this first family would be expected to expire in 2038, absent any applicable patent term extensions. The second family includes a pending U.S. provisional patent application, and any patents that grant from applications claiming priority to this U.S. provisional patent application would be expected to expire in 2039, absent any applicable patent term extensions. The third family includes a pending U.S. provisional patent application, and any patents that grant from applications claiming priority to this U.S. provisional patent application would be expected to expire in 2039, absent any applicable patent term extensions.

As indicated above, most of our owned patent applications are provisional patent applications. Provisional patent applications are not eligible to become issued patents until, among other things, we file a non-provisional patent application within 12 months of filing of one or more of our related provisional patent applications. If we do not timely file any non-provisional patent applications, we may lose our priority date with respect to our provisional patent applications and any patent protection on the inventions disclosed in our provisional patent applications. While we intend to timely file non-provisional patent applications relating to our provisional patent applications, we cannot predict whether any such patent applications will result in the issuance of patents that provide us with any competitive advantage. Moreover, the patent application and approval process is expensive and time-consuming. We may not be able to file and prosecute all necessary or desirable patent applications at a reasonable cost or in a timely manner.

The term of individual patents depends upon the legal term for patents in the countries in which they are obtained. In most countries in which we have filed, including the U.S., the patent term is 20 years from the

earliest filing date of a non-provisional patent application. In the U.S., a patent's term may be lengthened by patent term adjustment, which compensates a patentee for administrative delays by the USPTO in examining and granting a patent, or may be shortened if a patent is terminally disclaimed over an earlier filed patent. The term of a patent that covers a drug or biological product may also be eligible for patent term extension when FDA approval is granted for a portion of the term effectively lost as a result of the FDA regulatory review period, subject to certain limitations and provided statutory and regulatory requirements are met. Any such patent term extension can be for no more than five years, only one patent per approved product can be extended, the extension cannot extend the total patent term beyond 14 years from approval, and only those claims covering the approved drug, a method for using it or a method for manufacturing it may be extended. We may not receive an extension if we fail to exercise due diligence during the testing phase or regulatory review process, fail to apply within applicable deadlines, fail to apply prior to expiration of relevant patents or otherwise fail to satisfy applicable requirements. Moreover, the length of the extension could be less than we request. In the future, if and when our product candidates receive approval from the FDA or foreign regulatory authorities, we expect to apply for patent term extensions on issued patents we may obtain in the future covering those products, depending upon the length of the clinical trials for each product and other factors. There can be no assurance that any of our pending patent applications will issue or that we will benefit from any patent term extension or favorable adjustment to the term of any of our patents.

As with other biotechnology and pharmaceutical companies, our ability to maintain and solidify our proprietary and intellectual property position for our product candidates will depend on our success in obtaining effective patent claims and enforcing those claims if granted. However, our owned and licensed pending patent applications, and any patent applications that we may in the future file or license from third parties may not result in the issuance of patents. We also cannot predict the breadth of claims that may be allowed or enforced in our patents. Any issued patents that we may receive in the future may be challenged, invalidated, infringed or circumvented. In addition, because of the extensive time required for clinical development and regulatory review of a product candidate we may develop, it is possible that, before any of our product candidates can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby limiting the protection such patent would afford the respective product and any competitive advantage such patent may provide. For more information, see the section entitled "Risk Factors—Risks Related to Intellectual Property".

Other IP Rights

In addition to patents, we rely upon unpatented trade secrets and know-how and continuing technological innovation to develop and maintain our competitive position. However, trade secrets and know-how can be difficult to protect. We seek to protect our proprietary information, in part, by executing confidentiality agreements with our collaborators and scientific advisors, and non-competition, non-solicitation, confidentiality, and invention assignment agreements with our employees and consultants. We have also executed agreements requiring assignment of inventions with selected scientific advisors and collaborators. The confidentiality agreements we enter into are designed to protect our proprietary information and the agreements or clauses requiring assignment of inventions to us are designed to grant us ownership of technologies that are developed through our relationship with the respective counterparty. We cannot guarantee, however, that we have executed such agreements with all applicable counterparties, such agreements will not be breached, or that these agreements will afford us adequate protection of our intellectual property and proprietary rights. For more information, see the section entitled "Risk Factors—Risks Related to Intellectual Property".

Trademarks

We have filed and obtained trademark protection for the MAGENTA THERAPEUTICS character mark and service mark logo for pharmaceutical research and development services and biochemical research and development services. We plan to register trademarks in connection with our future products.

Government Regulation

Government authorities in the U.S. at the federal, state and local level and in other countries regulate, among other things, the research, development, testing, manufacture, quality control, approval, labeling, packaging, storage, record-keeping, promotion, advertising, distribution, post-approval monitoring and reporting, marketing and export and import of drug and biological products, such as MGTA-456 and any future product candidates. Generally, before a new drug or biologic can be marketed, considerable data demonstrating its quality, safety and efficacy must be obtained, organized into a format specific for each regulatory authority, submitted for review and approved by the regulatory authority.

U.S. drug development

In the U.S., the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act, or FDCA, and its implementing regulations and biologics under the FDCA, the Public Health Service Act, or PHSA, and their implementing regulations. Both drugs and biologics also are subject to other federal, state and local statutes and regulations. The process of obtaining regulatory approvals and the subsequent compliance with appropriate federal, state, and local statutes and regulations requires the expenditure of substantial time and financial resources. Failure to comply with the applicable U.S. requirements at any time during the product development process, approval process or post-market may subject an applicant to administrative or judicial sanctions. These sanctions could include, among other actions, the FDA's refusal to approve pending applications, withdrawal of an approval, a clinical hold, untitled or warning letters, product recalls or market withdrawals, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, restitution, disgorgement and civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

MGTA-456 and any future product candidates must be approved by the FDA through either a New Drug Application, or NDA, or a Biologics License Application, or BLA, process before they may be legally marketed in the U.S. The process generally involves the following:

- completion of extensive preclinical studies in accordance with applicable regulations, including studies conducted in accordance with good laboratory practice, or GLP, requirements;
- submission to the FDA of an investigational new drug, or IND, application, which must become effective before human clinical trials may begin;
- approval by an institutional review board, or IRB, or independent ethics committee at each clinical trial site before each trial may be initiated;
- performance of adequate and well-controlled human clinical trials in accordance with applicable IND regulations, good clinical practice, or GCP, requirements and other clinical trial-related regulations to establish the safety and efficacy of the investigational product for each proposed indication;
- submission to the FDA of an NDA or BLA;
- a determination by the FDA within 60 days of its receipt of an NDA or BLA to accept the filing for review;
- satisfactory completion of an FDA pre-approval inspection of the manufacturing facility or facilities where the drug or biologic will be produced to assess compliance with cGMP requirements to assure that the facilities, methods and controls are adequate to preserve the drug or biologic's identity, strength, quality and purity;
- potential FDA audit of the clinical trial sites that generated the data in support of the NDA or BLA; and
- FDA review and approval of the NDA or BLA, including consideration of the views of any FDA advisory committee, prior to any commercial marketing or sale of the drug or biologic in the U.S.

The preclinical and clinical testing and approval process requires substantial time, effort and financial resources, and we cannot be certain that any approvals for MGTA-456 and any future product candidates will be granted on a timely basis, or at all.

Preclinical studies and IND

Preclinical studies include laboratory evaluation of product chemistry and formulation, as well as *in vitro* and animal studies to assess safety and in some cases to establish a rationale for therapeutic use. The conduct of preclinical studies is subject to federal regulations and requirements, including GLP regulations for safety/toxicology studies.

An IND sponsor must submit the results of the preclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and plans for clinical trials, among other things, to the FDA as part of an IND. An IND is a request for authorization from the FDA to administer an investigational product to humans, and must become effective before human clinical trials may begin. Some long-term preclinical testing, such as animal tests of reproductive adverse events and carcinogenicity, may continue after the IND is submitted. An IND automatically becomes effective 30 days after receipt by the FDA, unless before that time, the FDA raises concerns or questions related to one or more proposed clinical trials and places the trial on clinical hold. In such a case, the IND sponsor and the FDA must resolve any outstanding concerns before the clinical trial can begin. As a result, submission of an IND may not result in the FDA allowing clinical trials to commence.

Clinical trials

The clinical stage of development involves the administration of the investigational product to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control, in accordance with GCP requirements, which include the requirement that all research subjects provide their informed consent for their participation in any clinical trial. Clinical trials are conducted under protocols detailing, among other things, the objectives of the clinical trial, dosing procedures, subject selection and exclusion criteria and the parameters to be used to monitor subject safety and assess efficacy. Each protocol, and any subsequent amendments to the protocol, must be submitted to the FDA as part of the IND. Furthermore, each clinical trial must be reviewed and approved by an IRB for each institution at which the clinical trial will be conducted to ensure that the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the informed consent form that must be provided to each clinical trial subject or his or her legal representative, and must monitor the clinical trial until completed. There also are requirements governing the reporting of ongoing clinical trials and completed clinical trial results to public registries.

A sponsor who wishes to conduct a clinical trial outside of the U.S. may, but need not, obtain FDA authorization to conduct the clinical trial under an IND. If a foreign clinical trial is not conducted under an IND, the sponsor may submit data from the clinical trial to the FDA in support of an NDA or BLA. The FDA will accept a well-designed and well-conducted foreign clinical study not conducted under an IND if the study was conducted in accordance with GCP requirements, and the FDA is able to validate the data through an onsite inspection if deemed necessary.

Clinical trials generally are conducted in three sequential phases, known as Phase I, Phase II and Phase III, and may overlap.

- Phase I clinical trials generally involve a small number of healthy volunteers or disease-affected patients who are initially exposed to a single dose and then multiple doses of the product candidate. The primary purpose of these clinical trials is to assess the metabolism, pharmacologic action, side effect tolerability and safety of the drug.

[Table of Contents](#)

- Phase II clinical trials involve studies in disease-affected patients to determine the dose required to produce the desired benefits. At the same time, safety and further pharmacokinetic and pharmacodynamic information is collected, possible adverse effects and safety risks are identified and a preliminary evaluation of efficacy is conducted.
- Phase III clinical trials generally involve a large number of patients at multiple sites and are designed to provide the data necessary to demonstrate the effectiveness of the product for its intended use, its safety in use and to establish the overall benefit/risk relationship of the product and provide an adequate basis for product labeling.

Post-approval trials, sometimes referred to as Phase IV clinical trials, may be conducted after initial marketing approval. These trials are used to gain additional experience from the treatment of patients in the intended therapeutic indication. In certain instances, the FDA may mandate the performance of Phase IV clinical trials as a condition of approval of an NDA or BLA.

Progress reports detailing the results of the clinical trials, among other information, must be submitted at least annually to the FDA and written IND safety reports must be submitted to the FDA and the investigators for serious and unexpected suspected adverse events, findings from other studies or animal or *in vitro* testing that suggest a significant risk for human subjects and any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure.

Phase I, Phase II and Phase III clinical trials may not be completed successfully within any specified period, if at all. The FDA or the sponsor may suspend or terminate a clinical trial at any time on various grounds, including a finding that the research subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of a clinical trial at its institution if the clinical trial is not being conducted in accordance with the IRB's requirements or if the drug or biologic has been associated with unexpected serious harm to patients. Additionally, some clinical trials are overseen by an independent group of qualified experts organized by the clinical trial sponsor, known as a data safety monitoring board or committee. This group provides authorization for whether a trial may move forward at designated check points based on access to certain data from the trial. Concurrent with clinical trials, companies usually complete additional animal studies and also must develop additional information about the chemistry and physical characteristics of the drug or biologic as well as finalize a process for manufacturing the product in commercial quantities in accordance with cGMP requirements. The manufacturing process must be capable of consistently producing quality batches of the product and, among other things, companies must develop methods for testing the identity, strength, quality and purity of the final product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the product candidates do not undergo unacceptable deterioration over their shelf life.

NDA/BLA and FDA review process

Following completion of the clinical trials, data are analyzed to assess whether the investigational product is safe and effective for the proposed indicated use or uses. The results of preclinical studies and clinical trials are then submitted to the FDA as part of an NDA or BLA, along with proposed labeling, chemistry and manufacturing information to ensure product quality and other relevant data. The NDA or BLA is a request for approval to market the drug or biologic for one or more specified indications and must contain proof of safety and efficacy for a drug or safety, purity and potency for a biologic. The application may include both negative and ambiguous results of preclinical studies and clinical trials, as well as positive findings. Data may come from company-sponsored clinical trials intended to test the safety and efficacy of a product's use or from a number of alternative sources, including studies initiated by investigators. To support marketing approval, the data submitted must be sufficient in quality and quantity to establish the safety and efficacy of the investigational product to the satisfaction of FDA. FDA approval of an NDA or BLA must be obtained before a drug or biologic may be marketed in the U.S.

[Table of Contents](#)

Under the Prescription Drug User Fee Act, or PDUFA, as amended, each NDA or BLA must be accompanied by a user fee. FDA adjusts the PDUFA user fees on an annual basis. According to the FDA's fee schedule, effective through September 30, 2018, the user fee for an application requiring clinical data, such as an NDA or BLA, is \$2,421,495. The sponsor of an approved NDA or BLA is also subject to an annual prescription drug program fee, which for fiscal year 2018 is \$304,162. Fee waivers or reductions are available in certain circumstances, including a waiver of the application fee for the first application filed by a small business. Additionally, no user fees are assessed on NDAs or BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA reviews all submitted NDAs and BLAs before it accepts them for filing, and may request additional information rather than accepting the NDA or BLA for filing. The FDA must make a decision on accepting an NDA or BLA for filing within 60 days of receipt. Once the submission is accepted for filing, the FDA begins an in-depth review of the NDA or BLA. Under the goals and policies agreed to by the FDA under PDUFA, the FDA has ten months, from the filing date, in which to complete its initial review of a new molecular-entity NDA or original BLA and respond to the applicant, and six months from the filing date of a new molecular-entity NDA or original BLA designated for priority review. The FDA does not always meet its PDUFA goal dates for standard and priority NDAs or BLAs, and the review process is often extended by FDA requests for additional information or clarification.

Before approving an NDA or BLA, the FDA will conduct a pre-approval inspection of the manufacturing facilities for the new product to determine whether they comply with cGMP requirements. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with cGMP requirements and adequate to assure consistent production of the product within required specifications. The FDA also may audit data from clinical trials to ensure compliance with GCP requirements. Additionally, the FDA may refer applications for novel drug products or drug products which present difficult questions of safety or efficacy to an advisory committee, typically a panel that includes clinicians and other experts, for review, evaluation and a recommendation as to whether the application should be approved and under what conditions, if any. The FDA is not bound by recommendations of an advisory committee, but it considers such recommendations when making decisions on approval. The FDA likely will reanalyze the clinical trial data, which could result in extensive discussions between the FDA and the applicant during the review process. After the FDA evaluates an NDA or BLA, it will issue an approval letter or a Complete Response Letter. An approval letter authorizes commercial marketing of the drug or biologic with specific prescribing information for specific indications. A Complete Response Letter indicates that the review cycle of the application is complete and the application will not be approved in its present form. A Complete Response Letter usually describes all of the specific deficiencies in the NDA or BLA identified by the FDA. The Complete Response Letter may require additional clinical data, additional pivotal Phase III clinical trial(s) and/or other significant and time-consuming requirements related to clinical trials, preclinical studies or manufacturing. If a Complete Response Letter is issued, the applicant may either resubmit the NDA or BLA, addressing all of the deficiencies identified in the letter, or withdraw the application. Even if such data and information are submitted, the FDA may decide that the NDA or BLA does not satisfy the criteria for approval. Data obtained from clinical trials are not always conclusive and the FDA may interpret data differently than we interpret the same data.

Orphan drug designation

Under the Orphan Drug Act, the FDA may grant orphan designation to a drug or biological product intended to treat a rare disease or condition, which is generally a disease or condition that affects fewer than 200,000 individuals in the U.S., or more than 200,000 individuals in the U.S. and for which there is no reasonable expectation that the cost of developing and making the product available in the U.S. for this type of disease or condition will be recovered from sales of the product.

Orphan drug designation must be requested before submitting an NDA or BLA. After the FDA grants orphan drug designation, the identity of the therapeutic agent and its potential orphan use are disclosed publicly by the

FDA. Orphan drug designation does not convey any advantage in or shorten the duration of the regulatory review and approval process.

If a product that has orphan designation subsequently receives the first FDA approval for the disease or condition for which it has such designation, the product is entitled to orphan drug exclusivity, which means that the FDA may not approve any other applications to market the same drug for the same indication for seven years from the date of such approval, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity by means of greater effectiveness, greater safety or providing a major contribution to patient care or in instances of drug supply issues. Competitors, however, may receive approval of either a different product for the same indication or the same product for a different indication but that could be used off-label in the orphan indication. Orphan drug exclusivity also could block the approval of one of our products for seven years if a competitor obtains approval before we do for the same product, as defined by the FDA, for the same indication we are seeking approval, or if our product is determined to be contained within the scope of the competitor's product for the same indication or disease. If one of our products designated as an orphan drug receives marketing approval for an indication broader than that which is designated, it may not be entitled to orphan drug exclusivity. Orphan drug status in the European Union has similar, but not identical, requirements and benefits.

Expedited development and review programs

The FDA has a fast track program that is intended to expedite or facilitate the process for reviewing new drugs and biologics that meet certain criteria. Specifically, new drugs and biologics are eligible for fast track designation if they are intended to treat a serious or life threatening condition and preclinical or clinical data demonstrate the potential to address unmet medical needs for the condition. Fast track designation applies to both the product and the specific indication for which it is being studied. The sponsor can request the FDA to designate the product for fast track status any time before receiving NDA or BLA approval, but ideally no later than the pre-NDA or pre-BLA meeting.

Any product submitted to the FDA for marketing, including under a fast track program, may be eligible for other types of FDA programs intended to expedite development and review, such as priority review and accelerated approval. Any product is eligible for priority review if it treats a serious or life-threatening condition and, if approved, would provide a significant improvement in safety and effectiveness compared to available therapies. The FDA will attempt to direct additional resources to the evaluation of an application for a new drug or biologic designated for priority review in an effort to facilitate the review.

A product may also be eligible for accelerated approval, if it treats a serious or life-threatening condition and generally provides a meaningful advantage over available therapies. In addition, it must demonstrate an effect on a surrogate endpoint that is reasonably likely to predict clinical benefit or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, or IMM, that is reasonably likely to predict an effect on IMM or other clinical benefit. As a condition of approval, the FDA may require that a sponsor of a drug or biologic receiving accelerated approval perform adequate and well-controlled post-marketing clinical trials. If the FDA concludes that a drug or biologic shown to be effective can be safely used only if distribution or use is restricted, it will require such post-marketing restrictions, as it deems necessary to assure safe use of the product.

Additionally, a drug or biologic may be eligible for designation as a breakthrough therapy if the product is intended, alone or in combination with one or more other drugs or biologics, to treat a serious or life-threatening condition and preliminary clinical evidence indicates that the product may demonstrate substantial improvement over currently approved therapies on one or more clinically significant endpoints. The benefits of breakthrough therapy designation include the same benefits as fast track designation, plus intensive guidance from the FDA to ensure an efficient drug development program.

Fast track designation, priority review, accelerated approval and breakthrough therapy designation do not change the standards for approval, but may expedite the development or approval process.

Pediatric information

Under the Pediatric Research Equity Act, or PREA, certain NDAs and BLAs and certain supplements to an NDA or BLA must contain data to assess the safety and efficacy of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The FDA may grant deferrals for submission of pediatric data or full or partial waivers. The Food and Drug Administration Safety and Innovation Act, or FDASIA, amended the FDCA to require that a sponsor who is planning to submit a marketing application for a drug that includes a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration submit an initial Pediatric Study Plan, or PSP, within 60 days of an end-of-Phase II meeting or, if there is no such meeting, as early as practicable before the initiation of the Phase III or Phase II/III study. The initial PSP must include an outline of the pediatric study or studies that the sponsor plans to conduct, including study objectives and design, age groups, relevant endpoints and statistical approach, or a justification for not including such detailed information, and any request for a deferral of pediatric assessments or a full or partial waiver of the requirement to provide data from pediatric studies along with supporting information. The FDA and the sponsor must reach an agreement on the PSP. A sponsor can submit amendments to an agreed-upon initial PSP at any time if changes to the pediatric plan need to be considered based on data collected from preclinical studies, early phase clinical trials and/or other clinical development programs.

Post-marketing requirements

Following approval of a new product, the manufacturer and the approved product are subject to continuing regulation by the FDA, including, among other things, monitoring and record-keeping activities, reporting of adverse experiences, complying with promotion and advertising requirements, which include restrictions on promoting drugs for unapproved uses or patient populations (known as “off-label use”) and limitations on industry-sponsored scientific and educational activities. Although physicians may prescribe legally available drugs for off-label uses, manufacturers may not market or promote such uses. Prescription drug promotional materials must be submitted to the FDA in conjunction with their first use. Further, if there are any modifications to the drug or biologic, including changes in indications, labeling or manufacturing processes or facilities, the applicant may be required to submit and obtain FDA approval of a new NDA/BLA or NDA/BLA supplement, which may require the development of additional data or preclinical studies and clinical trials.

The FDA may also place other conditions on approvals including the requirement for a Risk Evaluation and Mitigation Strategy, or REMS, to assure the safe use of the product. If the FDA concludes a REMS is needed, the sponsor of the NDA or BLA must submit a proposed REMS. The FDA will not approve the NDA or BLA without an approved REMS, if required. A REMS could include medication guides, physician communication plans or elements to assure safe use, such as restricted distribution methods, patient registries and other risk minimization tools. Any of these limitations on approval or marketing could restrict the commercial promotion, distribution, prescription or dispensing of products. Product approvals may be withdrawn for non-compliance with regulatory standards or if problems occur following initial marketing.

FDA regulations require that products be manufactured in specific approved facilities and in accordance with cGMP regulations. We rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of our products in accordance with cGMP regulations. These manufacturers must comply with cGMP regulations that require, among other things, quality control and quality assurance, the maintenance of records and documentation and the obligation to investigate and correct any deviations from cGMP. Manufacturers and other entities involved in the manufacture and distribution of approved drugs or biologics are required to register their establishments with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with cGMP requirements and other laws. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain cGMP compliance. The discovery of violative conditions, including failure to conform to cGMP regulations, could result in enforcement actions, and the discovery of problems with a product

after approval may result in restrictions on a product, manufacturer or holder of an approved NDA or BLA, including recall.

Companion diagnostics and complementary diagnostics

We believe that the success of our product candidates may depend, in part, on the development and commercialization of either a companion diagnostic or complementary diagnostic. Companion diagnostics and complementary diagnostics can identify patients who are most likely to benefit from a particular therapeutic product; identify patients likely to be at increased risk for serious side effects as a result of treatment with a particular therapeutic product; or monitor response to treatment with a particular therapeutic product for the purpose of adjusting treatment to achieve improved safety or effectiveness. Companion diagnostics and complementary diagnostics are regulated as medical devices by the FDA and, as such, require either clearance or approval prior to commercialization. The level of risk combined with available controls to mitigate risk determines whether a companion diagnostic device requires Premarket Approval Application, or PMA, approval or is cleared through the 510(k) premarket notification process. For a novel therapeutic product for which a companion diagnostic device is essential for the safe and effective use of the product, the companion diagnostic device should be developed and approved or 510(k)-cleared contemporaneously with the therapeutic. The use of the companion diagnostic device will be stipulated in the labeling of the therapeutic product. This is also true for a complementary diagnostic, although it is not a prerequisite for receiving the therapeutic.

Other regulatory matters

Manufacturing, sales, promotion and other activities following product approval are also subject to regulation by numerous regulatory authorities in the U.S. in addition to the FDA, including the Centers for Medicare & Medicaid Services, other divisions of the Department of Health and Human Services, the Department of Justice, the Drug Enforcement Administration, the Consumer Product Safety Commission, the Federal Trade Commission, the Occupational Safety & Health Administration, the Environmental Protection Agency and state and local governments.

Healthcare providers, physicians, and third party payors will play a primary role in the recommendation and prescription of any products for which we obtain marketing approval. Our future arrangements with third party payors, healthcare providers and physicians may expose us to broadly applicable fraud and abuse and other healthcare laws and regulations that may constrain the business or financial arrangements and relationships through which we market, sell and distribute any drugs for which we obtain marketing approval. In the U.S., these laws include: the federal Anti-Kickback Statute, the False Claims Act, and the Health Insurance Portability and Accountability Act of 1996, or HIPAA.

The Anti-Kickback Statute, or AKS, makes it illegal for any person, including a prescription drug manufacturer (or a party acting on its behalf), to knowingly and willfully solicit, receive, offer or pay any remuneration, directly or indirectly, in cash or in kind, that is intended to induce or reward referrals, including the purchase, recommendation, order or prescription of a particular drug, for which payment may be made under a federal healthcare program, such as Medicare or Medicaid. Violations of this law are punishable by up to five years in prison, criminal fines, administrative civil money penalties and exclusion from participation in federal healthcare programs. In addition, a person or entity does not need to have actual knowledge of the statute or specific intent to violate it.

The federal False Claims Act imposes civil penalties, including through civil whistleblower or qui tam actions, against individuals or entities (including manufacturers) for, among other things, knowingly presenting, or causing to be presented false or fraudulent claims for payment by a federal healthcare program or making a false statement or record material to payment of a false claim or avoiding, decreasing or concealing an obligation to pay money to the federal government. Penalties for a False Claims Act violation include three times the actual damages sustained by the government, plus mandatory civil penalties of between \$11,181 and \$22,363 for each

separate false claim, the potential for exclusion from participation in federal healthcare programs and the potential implication of various federal criminal statutes. The government may deem manufacturers to have “caused” the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. Claims which include items or services resulting from a violation of the federal Anti-Kickback Statute are false or fraudulent claims for purposes of the False Claims Act. Our future marketing and activities relating to the reporting of wholesaler or estimated retail prices for our products, the reporting of prices used to calculate Medicaid rebate information and other information affecting federal, state and third-party reimbursement for our products, and the sale and marketing of our product and any future product candidates, are subject to scrutiny under this law.

HIPAA, which imposes criminal and civil liability for executing a scheme to defraud any healthcare benefit program or making false statements relating to healthcare matters, and, as amended by the Health Information Technology for Economic and Clinical Health Act and its implementing regulations, also imposes obligations, including mandatory contractual terms and technical safeguards, with respect to maintaining the privacy, security and transmission of individually identifiable health information.

HIPAA, as amended by the Health Information Technology for Economic and Clinical Health Act of 2009, or HITECH, and their respective implementing regulations, which impose, among other things, specified requirements relating to the privacy, security and transmission of individually identifiable health information held by covered entities and their business associates. HITECH also created new tiers of civil monetary penalties, amended HIPAA to make civil and criminal penalties directly applicable to business associates, and gave state attorneys general new authority to file civil actions for damages or injunctions in federal courts to enforce the federal HIPAA laws and seek attorneys’ fees and costs associated with pursuing federal civil actions;

The Physician Payments Sunshine Act of 2010, which requires applicable manufacturers of covered drugs (those paid for by a federal healthcare program) to report to CMS any payments and other transfers of value made to physicians and teaching hospitals.

Analogous state and foreign fraud and abuse laws and regulations, such as state anti-kickback and false claims laws, may apply to sales or marketing arrangements and claims involving healthcare items or services. Such laws are generally broad and are enforced by various state agencies and private actions. Some state laws require pharmaceutical companies to comply with the pharmaceutical industry’s voluntary compliance guidelines and the relevant federal government compliance guidance, and require drug manufacturers to report information related to payments and other transfers of value to physicians and other healthcare providers or marketing expenditures. State and foreign laws also govern the privacy and security of health information in some circumstances, many of which differ from each other in significant ways and often are not pre-empted by HIPAA, thus complicating compliance efforts.

The scope and enforcement of each of these laws is uncertain and subject to rapid change in the current environment of healthcare reform, especially in light of the lack of applicable precedent and regulations. Federal and state enforcement bodies have recently increased their scrutiny of interactions between healthcare companies and healthcare providers, which has led to a number of investigations, prosecutions, convictions and settlements in the healthcare industry. It is possible that governmental authorities will conclude that our business practices may not comply with current or future statutes, regulations or case law involving applicable fraud and abuse or other healthcare laws and regulations. If our operations are found to be in violation of any of these laws or any other governmental regulations that may apply to us, we may be subject to significant civil, criminal and administrative penalties, damages, fines, imprisonment, exclusion of drugs from government funded healthcare programs, such as Medicare and Medicaid, and the curtailment or restructuring of our operations. If any of the physicians or other healthcare providers or entities with whom we expect to do business is found to be not in compliance with applicable laws, they may be subject to criminal, civil or administrative sanctions, including exclusions from government funded healthcare programs. Ensuring business arrangements comply with applicable healthcare laws, as well as responding to possible investigations by government authorities, can be time- and resource-consuming and can divert a company’s attention from the business.

Current and Future Legislation

In the U.S. and foreign jurisdictions, there have been a number of legislative and regulatory changes and proposed changes regarding the healthcare system that could prevent or delay marketing approval of our product candidates, restrict or regulate post-approval activities and affect our ability to profitably sell any product candidates for which we obtain marketing approval. We expect that current laws, as well as other healthcare reform measures that may be adopted in the future, may result in more rigorous coverage criteria and in additional downward pressure on the price that we, or any collaborators, may receive for any approved products.

With the new Administration and Congress, there will likely be additional administrative or legislative changes, including modification, repeal, or replacement of all, or certain provisions of, the ACA, which may impact reimbursement for drugs and biologics. For example, in Congress, the U.S. House of Representatives passed Affordable Care Act replacement legislation known as the American Health Care Act of 2017 in May 2017, which was not introduced in the Senate. However, The Tax Cuts and Jobs Act of 2017 includes a provision repealing, effective January 1, 2019, the tax-based shared responsibility payment imposed by the ACA on certain individuals who fail to maintain qualifying health coverage for all or part of a year that is commonly referred to as the “individual mandate.” Congress may consider other legislation to repeal or replace certain elements of the Affordable Care Act. In addition, since January 2017, President Trump has signed two Executive Orders designed to delay the implementation of certain provisions of the ACA or otherwise circumvent some of the requirements for health insurance mandated by the ACA. Further, the Trump administration has concluded that cost-sharing reduction, or CSR, payments to insurance companies required under the ACA have not received necessary appropriations from Congress and announced that it will discontinue these payments immediately until such appropriations are made. The loss of the CSR payments is expected to increase premiums on certain policies issued by qualified health plans under the ACA. A bipartisan bill to appropriate funds for CSR payments was introduced in the Senate, but the future of that bill is uncertain. Several state Attorneys General filed suit to stop the administration from terminating the subsidies, but their request for a restraining order was denied by a federal judge in California on October 25, 2017. Litigation and legislation over the ACA are likely to continue, with unpredictable and uncertain results.

Packaging and Distribution in the U.S.

If our products are made available to authorized users of the Federal Supply Schedule of the General Services Administration, additional laws and requirements apply. Products must meet applicable child-resistant packaging requirements under the U.S. Poison Prevention Packaging Act. Manufacturing, sales, promotion and other activities also are potentially subject to federal and state consumer protection and unfair competition laws.

The distribution of pharmaceutical products is subject to additional requirements and regulations, including extensive record-keeping, licensing, storage and security requirements intended to prevent the unauthorized sale of pharmaceutical products.

The failure to comply with any of these laws or regulatory requirements subjects firms to possible legal or regulatory action. Depending on the circumstances, failure to meet applicable regulatory requirements can result in criminal prosecution, fines or other penalties, injunctions, exclusion from federal healthcare programs, requests for recall, seizure of products, total or partial suspension of production, denial or withdrawal of product approvals, or refusal to allow a firm to enter into supply contracts, including government contracts. Any action against us for violation of these laws, even if we successfully defend against it, could cause us to incur significant legal expenses and divert our management’s attention from the operation of our business. Prohibitions or restrictions on sales or withdrawal of future products marketed by us could materially affect our business in an adverse way.

Changes in regulations, statutes or the interpretation of existing regulations could impact our business in the future by requiring, for example: (i) changes to our manufacturing arrangements; (ii) additions or modifications to product labeling; (iii) the recall or discontinuation of our products; or (iv) additional record-keeping requirements. If any such changes were to be imposed, they could adversely affect the operation of our business.

Other U.S. environmental, health and safety laws and regulations

We may be subject to numerous environmental, health and safety laws and regulations, including those governing laboratory procedures and the handling, use, storage, treatment and disposal of hazardous materials and wastes. From time to time and in the future, our operations may involve the use of hazardous and flammable materials, including chemicals and biological materials, and may also produce hazardous waste products. Even if we contract with third parties for the disposal of these materials and waste products, we cannot completely eliminate the risk of contamination or injury resulting from these materials. In the event of contamination or injury resulting from the use or disposal of our hazardous materials, we could be held liable for any resulting damages, and any liability could exceed our resources. We also could incur significant costs associated with civil or criminal fines and penalties for failure to comply with such laws and regulations.

We maintain workers' compensation insurance to cover us for costs and expenses we may incur due to injuries to our employees, but this insurance may not provide adequate coverage against potential liabilities. However, we do not maintain insurance for environmental liability or toxic tort claims that may be asserted against us.

In addition, we may incur substantial costs in order to comply with current or future environmental, health and safety laws and regulations. Current or future environmental laws and regulations may impair our research, development or production efforts. In addition, failure to comply with these laws and regulations may result in substantial fines, penalties or other sanctions.

U.S. patent term restoration and marketing exclusivity

Depending upon the timing, duration and specifics of FDA approval of MGTA-456 and any future product candidates, some of our U.S. patents may be eligible for limited patent term extension under the Drug Price Competition and Patent Term Restoration Act of 1984, commonly referred to as the Hatch-Waxman Amendments. The Hatch-Waxman Amendments permit restoration of the patent term of up to five years as compensation for patent term lost during product development and FDA regulatory review process. Patent-term restoration, however, cannot extend the remaining term of a patent beyond a total of 14 years from the product's approval date. The patent-term restoration period is generally one-half the time between the effective date of an IND and the submission date of an NDA or BLA plus the time between the submission date of an NDA or BLA and the approval of that application, except that the review period is reduced by any time during which the applicant failed to exercise due diligence. Only one patent applicable to an approved drug is eligible for the extension and the application for the extension must be submitted prior to the expiration of the patent. The U.S. PTO, in consultation with the FDA, reviews and approves the application for any patent term extension or restoration. In the future, we may apply for restoration of patent term for our currently owned or licensed patents to add patent life beyond its current expiration date, depending on the expected length of the clinical trials and other factors involved in the filing of the relevant NDA or BLA.

Market exclusivity provisions under the FDCA also can delay the submission or the approval of certain applications. The FDCA provides a five-year period of non-patent marketing exclusivity within the U.S. to the first applicant to gain approval of an NDA for a new chemical entity. A drug is a new chemical entity if the FDA has not previously approved any other new drug containing the same active moiety, which is the molecule or ion responsible for the action of the drug substance. During the exclusivity period, the FDA may not accept for review an abbreviated new drug application, or ANDA, or a 505(b)(2) NDA submitted by another company for another version of such drug where the applicant does not own or have a legal right of reference to all the data required for approval. However, an application may be submitted after four years if it contains a certification of patent invalidity or non-infringement. The FDCA also provides three years of marketing exclusivity for an NDA, 505(b)(2) NDA or supplement to an existing NDA if new clinical investigations, other than bioavailability studies, that were conducted or sponsored by the applicant are deemed by the FDA to be essential to the approval of the application, for example, new indications, dosages or strengths of an existing drug. This three-year exclusivity covers only the conditions of use associated with the new clinical investigations and does not prohibit

the FDA from approving ANDAs for drugs containing the original active agent. Five-year and three-year exclusivity will not delay the submission or approval of a full NDA. However, an applicant submitting a full NDA would be required to conduct or obtain a right of reference to all of the preclinical studies and adequate and well-controlled clinical trials necessary to demonstrate safety and effectiveness.

An abbreviated approval pathway for biological products shown to be similar to, or interchangeable with, an FDA-licensed reference biological product was created by the Biologics Price Competition and Innovation Act of 2009, or BPCI Act, as part of the Affordable Care Act. This amendment to the PHSA, in part, attempts to minimize duplicative testing. Biosimilarity, which requires that the biological product be highly similar to the reference product notwithstanding minor differences in clinically inactive components and that there be no clinically meaningful differences between the product and the reference product in terms of safety, purity and potency, can be shown through analytical studies, animal studies and a clinical trial or trials. Interchangeability requires that a biological product be biosimilar to the reference product and that the product can be expected to produce the same clinical results as the reference product in any given patient and, for products administered multiple times to an individual, that the product and the reference product may be alternated or switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biological product without such alternation or switch. Complexities associated with the larger, and often more complex, structure of biological products as compared to small molecule drugs, as well as the processes by which such products are manufactured, pose significant hurdles to implementation that are still being worked out by the FDA.

A reference biological product is granted four and twelve year exclusivity periods from the time of first licensure of the product. FDA will not accept an application for a biosimilar or interchangeable product based on the reference biological product until four years after the date of first licensure of the reference product, and FDA will not approve an application for a biosimilar or interchangeable product based on the reference biological product until twelve years after the date of first licensure of the reference product. "First licensure" typically means the initial date the particular product at issue was licensed in the U.S. Date of first licensure does not include the date of licensure of (and a new period of exclusivity is not available for) a biological product if the licensure is for a supplement for the biological product or for a subsequent application by the same sponsor or manufacturer of the biological product (or licensor, predecessor in interest, or other related entity) for a change (not including a modification to the structure of the biological product) that results in a new indication, route of administration, dosing schedule, dosage form, delivery system, delivery device or strength, or for a modification to the structure of the biological product that does not result in a change in safety, purity, or potency. Therefore, one must determine whether a new product includes a modification to the structure of a previously licensed product that results in a change in safety, purity, or potency to assess whether the licensure of the new product is a first licensure that triggers its own period of exclusivity. Whether a subsequent application, if approved, warrants exclusivity as the "first licensure" of a biological product is determined on a case-by-case basis with data submitted by the sponsor.

Pediatric exclusivity is another type of regulatory market exclusivity in the U.S. Pediatric exclusivity, if granted, adds six months to existing regulatory exclusivity periods. This six-month exclusivity may be granted based on the voluntary completion of a pediatric trial in accordance with an FDA-issued "Written Request" for such a trial.

European Union drug development

In the European Union, our future products also may be subject to extensive regulatory requirements. As in the U.S., medicinal products can be marketed only if a marketing authorization from the competent regulatory agencies has been obtained.

Similar to the U.S., the various phases of preclinical and clinical research in the European Union are subject to significant regulatory controls. Although the EU Clinical Trials Directive 2001/20/EC has sought to harmonize the EU clinical trials regulatory framework, setting out common rules for the control and authorization of clinical

trials in the EU, the EU Member States have transposed and applied the provisions of the Directive differently. This has led to significant variations in the member state regimes. Under the current regime, before a clinical trial can be initiated it must be approved in each of the EU countries where the trial is to be conducted by two distinct bodies: the National Competent Authority, or NCA, and one or more Ethics Committees, or ECs. Under the current regime all suspected unexpected serious adverse reactions to the investigated drug that occur during the clinical trial have to be reported to the NCA and ECs of the Member State where they occurred.

The EU clinical trials legislation currently is undergoing a transition process mainly aimed at harmonizing and streamlining clinical-trial authorization, simplifying adverse-event reporting procedures, improving the supervision of clinical trials and increasing their transparency. Recently enacted Clinical Trials Regulation EU No 536/2014 ensures that the rules for conducting clinical trials in the EU will be identical.

European Union drug marketing

Much like the Anti-Kickback Statute prohibition in the U.S., the provision of benefits or advantages to physicians to induce or encourage the prescription, recommendation, endorsement, purchase, supply, order or use of medicinal products is also prohibited in the European Union. The provision of benefits or advantages to physicians is governed by the national anti-bribery laws of European Union Member States, such as the UK Bribery Act 2010. Infringement of these laws could result in substantial fines and imprisonment.

Payments made to physicians in certain European Union Member States must be publically disclosed. Moreover, agreements with physicians often must be the subject of prior notification and approval by the physician's employer, his or her competent professional organization and/or the regulatory authorities of the individual European Union Member States. These requirements are provided in the national laws, industry codes or professional codes of conduct, applicable in the European Union Member States. Failure to comply with these requirements could result in reputational risk, public reprimands, administrative penalties, fines or imprisonment.

European Union drug review and approval

In the European Economic Area, or EEA, which is comprised of the 27 Member States of the European Union (including Norway and excluding Croatia), Iceland and Liechtenstein, medicinal products can only be commercialized after obtaining a Marketing Authorization, or MA. There are two types of marketing authorizations.

- The Community MA is issued by the European Commission through the Centralized Procedure, based on the opinion of the Committee for Medicinal Products for Human Use, or CHMP, of the European Medicines Agency, or EMA, and is valid throughout the entire territory of the EEA. The Centralized Procedure is mandatory for certain types of products, such as biotechnology medicinal products, orphan medicinal products, advanced-therapy medicines such as gene-therapy, somatic cell-therapy or tissue-engineered medicines and medicinal products containing a new active substance indicated for the treatment of HIV, AIDS, cancer, neurodegenerative disorders, diabetes, auto-immune and other immune dysfunctions and viral diseases. The Centralized Procedure is optional for products containing a new active substance not yet authorized in the EEA, or for products that constitute a significant therapeutic, scientific or technical innovation or which are in the interest of public health in the EU.
- National MAs, which are issued by the competent authorities of the Member States of the EEA and only cover their respective territory, are available for products not falling within the mandatory scope of the Centralized Procedure. Where a product has already been authorized for marketing in a Member State of the EEA, this National MA can be recognized in another Member States through the Mutual Recognition Procedure. If the product has not received a National MA in any Member State at the time of application, it can be approved simultaneously in various Member States through the Decentralized Procedure. Under the Decentralized Procedure an identical dossier is submitted to the competent authorities of each of the Member States in which the MA is sought, one of which is selected by the

applicant as the Reference Member State, or RMS. The competent authority of the RMS prepares a draft assessment report, a draft summary of the product characteristics, or SPC, and a draft of the labeling and package leaflet, which are sent to the other Member States (referred to as the Member States Concerned) for their approval. If the Member States Concerned raise no objections, based on a potential serious risk to public health, to the assessment, SPC, labeling, or packaging proposed by the RMS, the product is subsequently granted a national MA in all the Member States (i.e., in the RMS and the Member States Concerned).

Under the above described procedures, before granting the MA, the EMA or the competent authorities of the Member States of the EEA make an assessment of the risk-benefit balance of the product on the basis of scientific criteria concerning its quality, safety and efficacy.

European Union new chemical entity exclusivity

In the European Union, new chemical entities, sometimes referred to as new active substances, qualify for eight years of data exclusivity upon marketing authorization and an additional two years of market exclusivity. The data exclusivity, if granted, prevents regulatory authorities in the European Union from referencing the innovator's data to assess a generic application for eight years, after which generic marketing authorization can be submitted, and the innovator's data may be referenced, but not approved for two years. The overall ten-year period will be extended to a maximum of 11 years if, during the first eight years of those ten years, the marketing authorization holder obtains an authorization for one or more new therapeutic indications which, during the scientific evaluation prior to their authorization, are determined to bring a significant clinical benefit in comparison with currently approved therapies.

European Union orphan designation and exclusivity

In the European Union, the EMA's Committee for Orphan Medicinal Products grants orphan drug designation to promote the development of products that are intended for the diagnosis, prevention or treatment of life-threatening or chronically debilitating conditions affecting not more than 5 in 10,000 persons in the European Union community (or where it is unlikely that the development of the medicine would generate sufficient return to justify the investment) and for which no satisfactory method of diagnosis, prevention or treatment has been authorized (or, if a method exists, the product would be a significant benefit to those affected).

In the European Union, orphan drug designation entitles a party to financial incentives such as reduction of fees or fee waivers and ten years of market exclusivity is granted following medicinal product approval. This period may be reduced to six years if the orphan drug designation criteria are no longer met, including where it is shown that the product is sufficiently profitable not to justify maintenance of market exclusivity. Orphan drug designation must be requested before submitting an application for marketing approval. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process.

European Data Collection

The collection and use of personal health data in the European Union is governed by the provisions of the Data Protection Directive, and as of May 2018 the General Data Protection Regulation, or GDPR. These directive imposes several requirements relating to the consent of the individuals to whom the personal data relates, the information provided to the individuals, notification of data processing obligations to the competent national data protection authorities and the security and confidentiality of the personal data. The Data Protection Directive and GDPR also impose strict rules on the transfer of personal data out of the European Union to the U.S. Failure to comply with the requirements of the Data Protection Directive, the GDPR, and the related national data protection laws of the European Union Member States may result in fines and other administrative penalties. The GDPR introduces new data protection requirements in the European Union and substantial fines for breaches of the data protection rules. The GDPR regulations may impose additional responsibility and liability in relation to

[Table of Contents](#)

personal data that we process and we may be required to put in place additional mechanisms ensuring compliance with the new data protection rules. This may be onerous and adversely affect our business, financial condition, results of operations and prospects.

Rest of the world regulation

For other countries outside of the European Union and the U.S., such as countries in Eastern Europe, Latin America or Asia, the requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary from country to country. Additionally, the clinical trials must be conducted in accordance with GCP requirements and the applicable regulatory requirements and the ethical principles that have their origin in the Declaration of Helsinki.

If we fail to comply with applicable foreign regulatory requirements, we may be subject to, among other things, fines, suspension or withdrawal of regulatory approvals, product recalls, seizure of products, operating restrictions and criminal prosecution.

Additional laws and regulations governing international operations

If we further expand our operations outside of the U.S., we must dedicate additional resources to comply with numerous laws and regulations in each jurisdiction in which we plan to operate. The Foreign Corrupt Practices Act, or FCPA, prohibits any U.S. individual or business from paying, offering, authorizing payment or offering of anything of value, directly or indirectly, to any foreign official, political party or candidate for the purpose of influencing any act or decision of the foreign entity in order to assist the individual or business in obtaining or retaining business. The FCPA also obligates companies whose securities are listed in the U.S. to comply with certain accounting provisions requiring the company to maintain books and records that accurately and fairly reflect all transactions of the corporation, including international subsidiaries, and to devise and maintain an adequate system of internal accounting controls for international operations.

Compliance with the FCPA is expensive and difficult, particularly in countries in which corruption is a recognized problem. In addition, the FCPA presents particular challenges in the pharmaceutical industry, because, in many countries, hospitals are operated by the government, and doctors and other hospital employees are considered foreign officials. Certain payments to hospitals in connection with clinical trials and other work have been deemed to be improper payments to government officials and have led to FCPA enforcement actions.

Various laws, regulations and executive orders also restrict the use and dissemination outside of the U.S., or the sharing with certain non-U.S. nationals, of information classified for national security purposes, as well as certain products and technical data relating to those products. If we expand our presence outside of the U.S., it will require us to dedicate additional resources to comply with these laws, and these laws may preclude us from developing, manufacturing, or selling certain products and product candidates outside of the U.S., which could limit our growth potential and increase our development costs.

The failure to comply with laws governing international business practices may result in substantial civil and criminal penalties and suspension or debarment from government contracting. The Securities and Exchange Commission, or SEC, also may suspend or bar issuers from trading securities on U.S. exchanges for violations of the FCPA's accounting provisions.

Reimbursement

Sales of our products will depend, in part, on the extent to which our products will be covered by third-party payors, such as government health programs, commercial insurance and managed healthcare organizations. In the U.S., no uniform policy of coverage and reimbursement for drug or biological products exists. Accordingly, decisions regarding the extent of coverage and amount of reimbursement to be provided for any of our products

will be made on a payor-by-payor basis. As a result, the coverage determination process is often a time-consuming and costly process that will require us to provide scientific and clinical support for the use of our products to each payor separately, with no assurance that coverage and adequate reimbursement will be obtained.

The U.S. government, state legislatures and foreign governments have shown significant interest in implementing cost containment programs to limit the growth of government-paid health care costs, including price-controls, restrictions on reimbursement and requirements for substitution of generic products for branded prescription drugs. For example, the Affordable Care Act contains provisions that subject biological products to potential competition by lower-cost biosimilars and may reduce the profitability of drug products through increased rebates for drugs reimbursed by Medicaid programs, extension of Medicaid rebates to Medicaid managed care plans, mandatory discounts for certain Medicare Part D beneficiaries and annual fees based on pharmaceutical companies' share of sales to federal health care programs. Adoption of general controls and measures, coupled with the tightening of restrictive policies in jurisdictions with existing controls and measures, could limit payments for pharmaceutical drugs.

The Medicaid Drug Rebate Program requires pharmaceutical manufacturers to enter into and have in effect a national rebate agreement with the Secretary of the Department of Health and Human Services as a condition for states to receive federal matching funds for the manufacturer's outpatient drugs furnished to Medicaid patients. The Affordable Care Act made several changes to the Medicaid Drug Rebate Program, including increasing pharmaceutical manufacturers' rebate liability by raising the minimum basic Medicaid rebate on most branded prescription drugs from 15.1% of average manufacturer price, or AMP, to 23.1% of AMP and adding a new rebate calculation for "line extensions" (i.e., new formulations, such as extended release formulations) of solid oral dosage forms of branded products, creating a new methodology by which rebates owed by are calculated for drugs that are inhaled, infused, instilled, implanted or injected, as well as potentially impacting their rebate liability by modifying the statutory definition of AMP. The Affordable Care Act also expanded the universe of Medicaid utilization subject to drug rebates by requiring pharmaceutical manufacturers to pay rebates on Medicaid managed care utilization and by enlarging the population potentially eligible for Medicaid drug benefits. Pricing and rebate programs must also comply with the Medicaid rebate requirements of the U.S. Omnibus Budget Reconciliation Act of 1990.

The Medicare Prescription Drug, Improvement, and Modernization Act of 2003, or the MMA, established the Medicare Part D program to provide a voluntary prescription drug benefit to Medicare beneficiaries. Under Part D, Medicare beneficiaries may enroll in prescription drug plans offered by private entities that provide coverage of outpatient prescription drugs. Unlike Medicare Part A and B, Part D coverage is not standardized. While all Medicare drug plans must give at least a standard level of coverage set by Medicare, Part D prescription drug plan sponsors are not required to pay for all covered Part D drugs, and each drug plan can develop its own drug formulary that identifies which drugs it will cover and at what tier or level. However, Part D prescription drug formularies must include drugs within each therapeutic category and class of covered Part D drugs, though not necessarily all the drugs in each category or class. Any formulary used by a Part D prescription drug plan must be developed and reviewed by a pharmacy and therapeutic committee. Government payment for some of the costs of prescription drugs may increase demand for products for which we receive marketing approval. However, any negotiated prices for our products covered by a Part D prescription drug plan likely will be lower than the prices we might otherwise obtain. Moreover, while the MMA applies only to drug benefits for Medicare beneficiaries, private payors often follow Medicare coverage policy and payment limitations in setting their own payment rates. Any reduction in payment that results from the MMA may result in a similar reduction in payments from non-governmental payors.

For a drug product to receive federal reimbursement under the Medicaid or Medicare Part B programs or to be sold directly to U.S. government agencies, the manufacturer must extend discounts to entities eligible to participate in the 340B drug pricing program. The required 340B discount on a given product is calculated based on the AMP and Medicaid rebate amounts reported by the manufacturer. As of 2010, the Affordable Care Act expanded the types of entities eligible to receive discounted 340B pricing, although, under the current state of the

law, with the exception of children's hospitals, these newly eligible entities will not be eligible to receive discounted 340B pricing on orphan drugs. In addition, as 340B drug pricing is determined based on AMP and Medicaid rebate data, the revisions to the Medicaid rebate formula and AMP definition described above could cause the required 340B discount to increase.

As noted above, the marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. An increasing emphasis on cost containment measures in the U.S. has increased and we expect will continue to increase the pressure on pharmaceutical pricing. Coverage policies and third-party reimbursement rates may change at any time. Even if favorable coverage and reimbursement status is attained for one or more products for which we receive regulatory approval, less favorable coverage policies and reimbursement rates may be implemented in the future.

In recent years, additional laws have resulted in direct or indirect reimbursement reductions for certain Medicare providers.

- The Budget Control Act of 2011, among other things, created measures for spending reductions by Congress. A Joint Select Committee on Deficit Reduction, tasked with recommending a targeted deficit reduction of at least \$1.2 trillion for the years 2013 through 2021, was unable to reach required goals, thereby triggering the legislation's automatic reduction to several government programs. These changes included aggregate reductions to Medicare payments to providers of up to 2% per fiscal year, which went into effect in April 2013 and will remain in effect through 2027 unless additional Congressional action is taken.
- The American Taxpayer Relief Act of 2012, among other things, reduced Medicare payments to several providers, and increased the statute of limitations period for the government to recover overpayments to providers from three to five years.
- The Middle Class Tax Relief and Job Creation Act of 2012 required that the Centers for Medicare & Medicaid Services reduce the Medicare clinical laboratory fee schedule by 2% in 2013, which served as a base for 2014 and subsequent years. In addition, effective January 1, 2014, CMS also began bundling the Medicare payments for certain laboratory tests ordered while a patient received services in a hospital outpatient setting.

These laws, and future state and federal healthcare reform measures may be adopted in the future, any of which may result in additional reductions in Medicare and other healthcare funding and otherwise affect the prices we may obtain for any of our product candidates for which we may obtain regulatory approval or the frequency with which any such product candidate is prescribed or used.

In addition, in most foreign countries, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing and reimbursement vary widely from country to country. For example, the European Union provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. Reference pricing used by various European Union member states and parallel distribution, or arbitrage between low-priced and high-priced member states, can further reduce prices. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. In some countries, we may be required to conduct a clinical study or other studies that compare the cost-effectiveness of any of our product candidates to other available therapies in order to obtain or maintain reimbursement or pricing approval. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the European Union do not follow price structures of the U.S. and generally prices tend to be significantly lower. Publication of discounts by third-party

[Table of Contents](#)

payors or authorities may lead to further pressure on the prices or reimbursement levels within the country of publication and other countries. If pricing is set at unsatisfactory levels or if reimbursement of our products is unavailable or limited in scope or amount, our revenues from sales by us or our strategic partners and the potential profitability of any of our product candidates in those countries would be negatively affected.

Employees

As of April 30, 2018, we had 48 full-time employees, 21 of our employees have Ph.D. or M.D. degrees and 30 of our employees are engaged in research and development activities. None of our employees are represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

Facilities

We lease a facility containing our research and development, laboratory and office space, which consists of approximately 12,500 square feet located at 50 Hampshire Street, Cambridge, Massachusetts. Our lease expires in August 2018.

Legal Proceedings

As of the date of this prospectus, we were not party to any material legal matters or claims. In the future, we may become party to legal matters and claims arising in the ordinary course of business, the resolution of which we do not anticipate would have a material adverse impact on our financial position, results of operations or cash flows.

MANAGEMENT**Executive Officers, Significant Employees and Directors**

The following table sets forth certain information about our executive officers, significant employees and directors, including their ages as of March 31, 2018.

Name	Age	Position(s)
Executive Officers:		
Jason Gardner, D.Phil.	47	Director, President and Chief Executive Officer
Michael P. Cooke, Ph.D.	56	Chief Scientific Officer
John C. Davis, Jr., M.D.	56	Chief Medical Officer
Christina K. Isacson, Ph.D.	39	Chief Business Officer
Zoran Zdraveski, J.D., Ph.D.	48	Secretary, Senior Vice President and Chief Legal Officer
Significant Employees:		
Cindy Driscoll	52	Treasurer, Vice President, Finance
Non-Employee Directors:		
Jeffrey Albers ⁽²⁾	46	Director
Michael W. Bonney ⁽¹⁾	59	Director
Bruce Booth, D.Phil. ⁽¹⁾	43	Director
Alexis A. Borisy ⁽²⁾⁽³⁾	46	Director
Blake Byers, Ph.D. ⁽³⁾	33	Director
Thomas O. Daniel, M.D. ⁽²⁾	64	Director
Amy L. Ronneberg ⁽¹⁾	44	Director
David T. Scadden, M.D. ⁽³⁾	65	Director

(1) Member of the Audit Committee.

(2) Member of the Compensation Committee.

(3) Member of the Nominating and Corporate Governance Committee.

Executive Officers and Significant Employees

Jason Gardner, D.Phil., co-founder of Magenta, has served as our President and Chief Executive Officer and as a member of our board of directors since February 2016. Dr. Gardner has more than 20 years of experience in stem cell science, drug development and industry leadership roles. He joined Atlas Venture in November 2015 as an Entrepreneur-in-Residence to create Magenta with Third Rock Ventures. He previously worked at GlaxoSmithKline plc. from 2005, most recently as Vice President and Head of the R&D Satellite in Boston. He created and led the Regenerative Medicine Unit, established partnerships with The Harvard Stem Cell Institute, and The Telethon Institute for Gene Therapy, from which the first stem cell gene therapy (Strimvelis) was approved. Prior to that, Dr. Gardner was the Head of the Center of Excellence for External Drug Discovery and was a member of the clinical project team that led the late stage development and NDA approval for Tykerb for breast cancer. Dr. Gardner currently serves on the board of directors of Obsidian Therapeutics, Inc. Dr. Gardner completed a postdoctoral fellowship in stem cell biology with Professor David Scadden at Harvard Medical School. He was educated in the U.K. and holds a doctorate from Oxford University, and graduate and undergraduate degrees in Natural Sciences (Biochemistry) from Cambridge University. Dr. Gardner is qualified to serve on our board of directors because of his insight into our operations and strategy as a result of being our Chief Executive Officer and his experience in the life sciences industry.

Michael P. Cooke, Ph.D. has served as our Chief Scientific Officer since July 2016. Dr. Cooke has more than 25 years of experience in biotechnology and large pharma where he has been responsible for the discovery and development of a portfolio of products to treat autoimmune disease, enhance vaccines, and improve hematopoietic stem cell transplant, including several products that are in clinical development. Prior to joining Magenta, Dr. Cooke worked at Novartis from July 1999 to June 2016, most recently as the Executive Director of

Immunology at their La Jolla research campus. Prior to Novartis, Dr. Cooke worked at SyStemix Inc. from 1993 to 1999, a biotechnology company focused on hematopoietic stem cells, where he was the Director of Functional Genomics. Dr. Cooke is an author on more than 60 peer-reviewed publications focused on using genetics and genomics to study the biology of hematopoietic stem cells and the immune system and translating these findings into novel therapeutics to improve patient outcomes. Dr. Cooke received his Ph.D. in Biochemistry from the University of Washington with Dr. Roger Perlmutter and completed postdoctoral work with Dr. Chris Goodnow at Stanford University.

John C. Davis, Jr., M.D. has served as our Chief Medical Officer since February 2018. Prior to joining Magenta, Dr. Davis was Senior Vice President and Head of Early Clinical Development at Pfizer Inc. from 2016 to 2018. Prior to his role at Pfizer, Dr. Davis served as Vice President and Global Therapeutic Area Head of Immunology at Baxalta which is now wholly-owned by Shire plc, from 2015 to 2016. Dr. Davis had multiple roles at Genentech, Inc. from 2007 to 2015 and ultimately was Senior Group Director and Head of the Inflammation and Cardiovascular/Metabolism Group in the Early Clinical Development Group. Dr. Davis spent nearly 10 years on faculty at The University of California San Francisco leading clinical research in autoimmune diseases, where he most recently was Professor of Clinical Medicine until 2015. He continues to see patients, teach, and serve as volunteer faculty at the Boston VA Medical Center. Dr. Davis earned an M.D. from the University of Maryland. Dr. Davis trained in Internal Medicine and Rheumatology at The University of California San Francisco. He continued training in clinical research and rheumatology at The National Institutes of Health NIAMS Intramural Program. He holds a Masters in Public Health in Epidemiology from the University of California Berkeley, and a Master of Science in Anatomy from the University of Maryland School of Medicine.

Christina K. Isacson, Ph.D. joined Magenta in July 2016 and has served as our Chief Business Officer since January 2018. Dr. Isacson has over 13 years of experience in senior business development in biotechnology companies and company creation. Dr. Isacson is responsible for Magenta's business and corporate development, and the establishment and management of partnerships. Dr. Isacson joined Third Rock Ventures as a Principal to lead the partner development team and to focus on new company formation from September 2013 to August 2016. While at Third Rock Ventures, she was part of the founding management team for Decibel Therapeutics Inc. and Interim Head of Business Development for Edimer Pharmaceuticals Inc. Prior to joining Third Rock Ventures, Christina was a senior member of the corporate development team at Ironwood Pharmaceuticals, Inc., or Ironwood, from July 2007 to September 2013, where she led the business and commercial roles on several development teams, and contributed to the growth of the pipeline through the establishment and management of the company's in-licensing efforts. Prior to Ironwood, she formed several early-stage companies while part of the Technology Development Fund at Boston University and during her time at Accelerator Corporation in Seattle. Dr. Isacson holds an undergraduate degree in biology from McGill University and a doctorate in neuroscience from Tufts University School of Medicine.

Zoran Zdraveski, J.D., Ph.D. has served as our Chief Legal Officer since April 2017. Dr. Zdraveski is responsible for all aspects of Magenta's legal, intellectual property, and compliance functions. Dr. Zdraveski has more than 16 years of experience in the legal field in the biopharmaceutical industry. Most recently he served as Vice President and Associate General Counsel at Epizyme Inc., or Epizyme, from July 2012 to April 2017, where he established the legal team and managed all aspects of legal, intellectual property and compliance both before and after the company's 2013 initial public offering. Prior to joining Epizyme, he held patent counsel positions at Ironwood from April 2011 to July 2012 and Genzyme Therapeutics, or Genzyme, from September 2009 to April 2011. Dr. Zdraveski earned a doctorate in biochemistry from the Massachusetts Institute of Technology, holds a J.D. from Suffolk University Law School, a graduate degree in chemistry and undergraduates degrees in chemistry and studio art, all from Southern Methodist University.

Cindy Driscoll has served as our Vice President, Finance since June 2017. Ms. Driscoll has more than 25 years of financial leadership experience. Prior to joining Magenta in June 2017, Ms. Driscoll worked at Tokai Pharmaceuticals, Inc., or Tokai, from June 2011 to June 2017, most recently as the vice president of finance from September 2014 to June 2017, where she oversaw all finance and administrative operations for the publicly-

traded company, including supporting its 2014 initial public offering. Prior to Tokai, Ms. Driscoll also worked as a financial consultant from July 2005 to June 2011, during which time she served as controller for Gloucester Pharmaceuticals, Inc. (now owned by Celgene Corporation) and Transmolecular, Inc. (now owned by Morphotek, Inc.) and supported due diligence efforts related to acquisitions of both companies. Ms. Driscoll earned her undergraduate degree in economics from the State University of New York at Oswego and completed her Master of Business Administration at Suffolk University.

Non-Employee Directors

Jeffrey Albers has served as a member of our board of directors since July 2017. Mr. Albers has over fifteen years of experience in leadership roles in the biopharmaceutical industry and is currently the president and chief executive officer of Blueprint Medicines Corporation, or Blueprint. Prior to joining Blueprint in July 2014, Mr. Albers was president of Algeta ASA, or Algeta, a Norwegian biopharmaceutical company from January 2012 to April 2014, where he oversaw the commercial and business functions. Prior to Algeta, from July 2005 to November 2011, Mr. Albers was at Genzyme, a biotechnology company that is now a wholly-owned subsidiary of Sanofi S.A., most recently as vice president of the U.S. hematology and oncology business unit. Mr. Albers serves on the board of directors of Blueprint and the New England American Cancer Society. Mr. Albers received a B.S. from Indiana University and an M.B.A. and a J.D. from Georgetown University. We believe that Mr. Albers' leadership in the life sciences industry qualifies him to serve on our board of directors.

Michael W. Bonney has served as a member and chair of our board of directors since October 2016. Mr. Bonney is the Chief Executive Officer and Chair of Kaleido Biosciences, Inc. since June 2017. Mr. Bonney was a Partner at Third Rock Ventures, a healthcare venture firm, from January to July 2016. Mr. Bonney previously served as the Chief Executive Officer and a member of the board of directors of Cubist Pharmaceuticals, Inc., or Cubist, a biopharmaceutical company (now a wholly-owned subsidiary of Merck & Co., Inc.), from June 2003 until his retirement in December 2014. From January 2002 to June 2003, he served as Cubist's President and Chief Operating Officer. Mr. Bonney is a trustee of the tekla complex of health care dedicated, publicly traded funds. In addition, Mr. Bonney currently serves as a director of Celgene Corporation, Alnylam Pharmaceuticals Inc. and Sarepta Corporation. Mr. Bonney formerly served on the board of directors of Global Blood Therapeutics, Inc., NPS Pharmaceuticals, Inc. and Cubist. Mr. Bonney received a B.A. in Economics from Bates College. Mr. Bonney possesses over 30 years of operational, commercial and senior management experience in the biopharmaceutical industry, including his long tenure as the Chief Executive Officer and a director of Cubist. We believe Mr. Bonney's breadth of experience over the past 35 years and deep commercial background qualifies him to serve on our board of directors.

Bruce Booth, D.Phil., one of our founding investors and board members, has served as a member of our board of directors since February 2016. Dr. Booth joined Atlas Venture in 2005, and currently serves as partner. Previously, from 2004 to 2005, Dr. Booth was a principal at Caxton Health Holdings L.L.C., a healthcare-focused investment firm, where he focused on the firm's venture capital activities. Prior to Caxton, from 1999 to 2004, he was an associate principal at McKinsey & Company, a global strategic management consulting firm, where he advised clients on R&D productivity, corporate strategy and business development issues across the biopharmaceutical sector. Dr. Booth serves on the board of several privately held companies, as well as on the board of miRagen Therapeutics, Inc., Zafgen, Inc. and Unum Therapeutics Inc. Dr. Booth also serves on UCB Pharma's New Medicines Scientific Advisory Board, and participates on several other advisory boards for pharmaceutical companies and academic medical centers. As a British Marshall Scholar, Dr. Booth holds a D.Phil in molecular immunology from Oxford University's Nuffield Department of Medicine and a B.S. in biochemistry, summa cum laude, from Pennsylvania State University. We believe Dr. Booth's extensive leadership, executive, managerial and business experience with life sciences companies, including experience in the formation, development and business strategy of multiple start-up companies in the life sciences sector qualifies him to serve on our board of directors.

Alexis A. Borisy, one of our founding investors and board members, has served as a member of our board of directors since June 2015. Since 2010, Mr. Borisy has been a partner at Third Rock Ventures, or Third Rock, a

life sciences venture capital firm focused on the formation, development and strategy of new companies. Mr. Borisy co-founded Blueprint and served as the interim chief executive officer from May 2013 through July 2014 and has served as a member of its board of directors since April 2011. Since November 2013, Mr. Borisy has served as a member of the board of directors of Editas Medicine, Inc. Since 2011, Mr. Borisy has served as executive chairman of Warp Drive Bio, LLC, a life sciences company focusing on genomics where he served as chief executive officer from 2011 to July 2013. In addition, Mr. Borisy currently serves on the board of directors of the following privately held biopharmaceutical companies: Revolution Medicines, Inc., Relay Therapeutics, Inc., Tango Therapeutics, Inc. and Celsius Therapeutics. From 2007 to 2012, Mr. Borisy served as chairman of FORMA Therapeutics, Inc., a biopharmaceutical company focused on discovering and developing medicines in cancer and other genetically-driven diseases. Mr. Borisy co-founded Foundation Medicine, Inc., or Foundation Medicine, where he served as its interim chief executive officer from 2009 to 2011 and has served as a member of its board of directors since 2009, including as chairman of Foundation Medicine's board of directors from 2011 to February 2017. Mr. Borisy received an A.B. in chemistry from the University of Chicago and an A.M. from Harvard University. We believe Mr. Borisy's detailed knowledge of our company and long tenure with us, along with his experience working with and serving on the boards of directors of life sciences companies, and his experience working in the venture capital industry qualifies him to serve on our board of directors.

Blake Byers, Ph.D. has served as a member of our board of directors since April 2017. Since 2010, Dr. Byers has worked at GV (formerly Google Ventures). As an investor and partner at GV, Dr. Byers partners with founders of life science and digital companies. Dr. Byers serves as Interim President and as a member of the board of directors of Pact Pharma, Inc. Dr. Byers also serves on the board of directors of several private companies, including IonQ Inc. and LendUp. Prior to joining GV, Dr. Byers helped start two companies, led research projects on biomedical engineering and stem cells at Stanford University and was an angel investor. Dr. Byers received a Ph.D. and M.S. in bioengineering from Stanford University and holds a B.S. in biomedical engineering and economics from Duke University. We believe Dr. Byers' experience working in the venture capital industry and history with stem cell technology qualifies him to serve on our board of directors.

Thomas O. Daniel, M.D. has served as a member of our board of directors since October 2016. Dr. Daniel has 18 years of experience in biopharmaceutical discovery and development. He is currently Chairman of Vividion Therapeutics, Inc., is a venture partner at ARCH Venture Partners, Inc., Zafgen, Inc., VIR Biotechnology, Inc., ImmusanT, Inc. and Gossamer Bio, Inc. He was recently Chairman of Research at Celgene Corporation, and served as President of Research and Early Development from December 2006 until February 2012, and as Executive Vice President and President of Research and Early Development until December 2015. Previously, he served as Chief Scientific Officer and Director at Ambrx Inc., from August 2003 to November 2006. Dr. Daniel also served as Vice President of Research at Amgen Inc. from August 2002 to April 2003, where he was Research Site Head of Amgen Washington and Therapeutic Area Head of Inflammation. Prior to Amgen's acquisition of Immunex Corporation, Dr. Daniel served as Senior Vice President of Discovery Research at Immunex Corporation from May 2000 to August 2002. Dr. Daniel is a Trustee of Reed College, serves on the Board of the Alliance for Lupus Research, and advises BlackThorn Therapeutics, Inc. a privately-held biotechnology company. Dr. Daniel serves as a member of the Biomedical Science Advisory Board of Vanderbilt University Medical Center. A nephrologist and former academic investigator, Dr. Daniel was previously the C.M. Hakim Professor of Medicine and Cell Biology at Vanderbilt University, and Director of the Vanderbilt Center for Vascular Biology. He formerly conducted research in the Howard Hughes Medical Institute at UC San Francisco, earned an M.D. from the University of Texas, Southwestern, and completed medical residency at Massachusetts General Hospital. Dr. Daniel's qualifications to serve on our board of directors include his biotechnology and pharmaceutical experience, including senior leadership roles at global biopharmaceutical companies Celgene Corporation and Amgen.

Amy L. Ronneberg has served on our board of directors since March 2018. Ms. Ronneberg joined Be The Match, a healthcare organization, as the Chief Financial Officer in 2013, and also serves as the President at Be The Match BioTherapies, a start-up company. Ms. Ronneberg formulated a new organizational operating model, established international operations, transformed several struggling areas within the organization and directed the completion of

a seven story headquarter. Ms. Ronneberg has 20 years of experience in financial and operational leadership, serving as Executive Vice President, CFO and Chief Operating Officer of North American Membership Group, a private equity-owned media company. Prior to that, Ms. Ronneberg spent 12 years at Capella University, where she served in roles such as Vice President of Finance and Vice President of Operations lead enterprise-wide operations and customer service. Ms. Ronneberg also worked for Ernst & Young for several years as an Audit Manager. Ms. Ronneberg is a member of the executive committee for the World Marrow Donor Association and previously served as chairman of the board of Twin Cities in Motion, Minneapolis. Ms. Ronneberg earned a Master's in Business Administration from Capella University, Minneapolis, Minnesota and a B.B.A. in Accounting from University of Wisconsin-Eau Claire. We believe Ms. Ronneberg's financial expertise and knowledge of the transplant industry qualifies her to serve on our board of directors.

David T. Scadden, M.D., one of our co-founders, has served on our board of directors and as chair of our Scientific Advisory Board since November 2016. Dr. Scadden is the Gerald and Darlene Jordan Professor of Medicine at Harvard University since 2016. He and Professor Douglas Melton founded and jointly direct the Harvard Stem Cell Institute, which is the largest institute dedicated to bringing stem cell biology to medical care in the world. With Professor Melton, Dr. Scadden founded and he chairs the Department of Stem Cell and Regenerative Biology Department at Harvard University, the first department to span faculties in Harvard's history. He is a hematologist/oncologist and directs the Center for Regenerative Medicine at the Massachusetts General Hospital and previously chaired the Hematologic Malignancies program in the MGH Cancer Center. Dr. Scadden is an expert on the medical applications of stem cell biology with a particular emphasis on their use in the settings of cancer and AIDS. He has published over 300 scientific papers and book chapters, and his laboratory has made fundamental contributions in how the stem cell niche regulates stem cell function and in normal and disease-corrupted hematopoiesis. Dr. Scadden serves as a director on the board of Agios Pharmaceuticals, Inc. In addition, Dr. Scadden is a member of the board of several private companies, including Clear Creek Bio, Inc., Red Oak Medicines Inc. and LifeVault Bio, Inc., and also serves on several scientific advisory boards, including Magenta's. In addition, he has served or serves on the Board of Scientific Counselors for the National Cancer Institute, the Board of External Experts for the National Heart, Lung and Blood Institute, Board of Directors of the International Society for Stem Cell Research (ISSCR) and is an Associate Member of the Broad Institute of Harvard and MIT. He is an elected member of the National Academy of Medicine and the American Academy of Arts and Sciences and is a fellow of the American Association for the Advancement of Science and the American College of Physicians. He is the recipient of numerous awards from scholarly societies and honorary degrees from multiple universities. We believe Dr. Scadden's experience as a physician and medical researcher qualifies him to serve on our board of directors.

Composition of our Board of Directors

Our board of directors consists of nine members, each of whom are members pursuant to the board composition provisions of our certificate of incorporation and our stockholders agreement, which agreement is described under "Certain Relationships and Related Party Transactions" in this prospectus. These board composition provisions will terminate upon the completion of this offering. Upon the termination of these provisions, there will be no further contractual obligations regarding the election of our directors. Effective upon the completion of this offering, we intend to form a nominating and corporate governance committee. Our nominating and corporate governance committee and our board of directors may consider a broad range of factors relating to the qualifications and background of director nominees, which may include diversity, which is not only limited to race, gender or national origin, although we currently have no formal policy regarding board diversity. Our nominating and corporate governance committee's and our board of directors' priority in selecting board members is identification of persons who will further the interests of our stockholders through his or her established record of professional accomplishment, the ability to contribute positively to the collaborative culture among board members, knowledge of our business, understanding of the competitive landscape and professional and personal experiences and expertise relevant to our growth strategy. Our directors hold office until their successors have been elected and qualified or until the earlier of their resignation or removal. Our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the

Table of Contents

completion of this offering also provide that our directors may be removed only for cause by the affirmative vote of the holders of at least two-thirds of the votes that all our stockholders would be entitled to cast in an annual election of directors, and that any vacancy on our board of directors, including a vacancy resulting from an enlargement of our board of directors, may be filled only by vote of a majority of our directors then in office.

Director Independence. Our board of directors has determined that all of the members of the board of directors, except for Dr. Gardner, are independent directors, including for purposes of the rules of the NASDAQ Stock Market and relevant federal securities laws and regulations. There are no family relationships among any of our directors or executive officers.

Staggered Board. In accordance with the terms of our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering, our board of directors will be divided into three classes, Class I, Class II and Class III, with each class serving staggered three-year terms. Upon the expiration of the term of a class of directors, directors in that class will be eligible to be elected for a new three-year term at the annual meeting of stockholders in the year in which their term expires.

- Our Class I directors will be Amy L. Ronneberg, Alexis A. Borisy and Blake Byers, Ph.D.;
- Our Class II directors will be Michael W. Bonney, Jeffrey Albers and David T. Scadden, M.D.; and
- Our Class III directors will be Jason Gardner, D.Phil., Bruce Booth, D.Phil. and Thomas O. Daniel, M.D.

Our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering provide that the number of directors may be changed only by resolution of our board of directors.

The division of our board of directors into three classes with staggered three-year terms may delay or prevent stockholder efforts to effect a change of our management or a change in control.

Committees of our Board of Directors

Our board of directors has established an audit committee, a compensation committee and a nominating and corporate governance committee, each of which will operate pursuant to a charter to be adopted by our board of directors and will be effective upon completion of the offering. Following the completion of this offering, copies of each committee's charter will be posted on the corporate governance section of our website, at www.magentatx.com. The inclusion of our website address in this prospectus does not incorporate by reference the information on or accessible through our website into this prospectus.

Audit Committee. Effective upon completion of this offering, Michael W. Bonney, Bruce Booth, D.Phil., and Amy L. Ronneberg will serve on the audit committee, which will be chaired by Amy L. Ronneberg. Our board of directors has determined that each of Michael W. Bonney, Bruce Booth, D.Phil., and Amy L. Ronneberg are "independent" for audit committee purposes as that term is defined in the rules of the SEC and the applicable NASDAQ Stock Market rules, and has sufficient knowledge in financial and auditing matters to serve on the audit committee. Our board of directors has designated Amy L. Ronneberg as an "audit committee financial expert," as defined under the applicable rules of the SEC. The audit committee's responsibilities include:

- appointing, approving the compensation of, and assessing the independence of our independent registered public accounting firm;
- pre-approving auditing and permissible non-audit services, and the terms of such services, to be provided by our independent registered public accounting firm;
- reviewing the overall audit plan with our independent registered public accounting firm and members of management responsible for preparing our financial statements;

Table of Contents

- reviewing and discussing with management and our independent registered public accounting firm our annual and quarterly financial statements and related disclosures as well as critical accounting policies and practices used by us;
- coordinating the oversight and reviewing the adequacy of our internal control over financial reporting;
- establishing policies and procedures for the receipt, retention and treatment of accounting-related complaints and concerns;
- recommending based upon the audit committee's review and discussions with management and our independent registered public accounting firm whether our audited financial statements shall be included in our Annual Report on Form 10-K;
- monitoring the integrity of our financial statements and our compliance with legal and regulatory requirements as they relate to our financial statements and accounting matters;
- preparing the audit committee report required by SEC rules to be included in our annual proxy statement;
- reviewing all related person transactions for potential conflict of interest situations and approving all such transactions; and
- reviewing quarterly earnings releases and scripts.

Compensation Committee. Effective upon completion of this offering, Jeffrey Albers, Alexis A. Borisy and Thomas O. Daniel, M.D. will serve on the compensation committee, which will be chaired by Thomas O. Daniel, M.D. Our board of directors has determined that each member of the compensation committee is "independent" as defined in the applicable NASDAQ Stock Market rules. The compensation committee's responsibilities include:

- annually reviewing and recommending corporate goals and objectives relevant to the compensation of our Chief Executive Officer to our board of directors;
- evaluating the performance of our Chief Executive Officer in light of such corporate goals and objectives and recommending to our board of directors for determination the compensation of our Chief Executive Officer;
- reviewing and approving the compensation of our other executive officers;
- reviewing and establishing our overall management compensation, philosophy and policy;
- overseeing and administering our compensation and similar plans;
- evaluating and assessing potential and current compensation advisors in accordance with the independence standards identified in the applicable NASDAQ Stock Market rules;
- retaining and approving the compensation of any compensation advisors;
- reviewing and approving our policies and procedures for the grant of equity-based awards;
- reviewing and making recommendations to the board of directors with respect to director compensation; and
- reviewing and discussing with management the compensation discussion and analysis to be included in our annual proxy statement or Annual Report on Form 10-K.

Nominating and Corporate Governance Committee. Effective upon completion of this offering, Alexis A. Borisy, Blake Byers, Ph.D. and David T. Scadden, M.D. will serve on the nominating and corporate governance committee, which will be chaired by Alexis A. Borisy. Our board of directors has determined that each member

[Table of Contents](#)

of the nominating and corporate governance committee is “independent” as defined in the applicable NASDAQ Stock Market rules. The nominating and corporate governance committee’s responsibilities include:

- developing and recommending to the board of directors criteria for board and committee membership;
- establishing procedures for identifying and evaluating board of director candidates, including nominees recommended by stockholders;
- identifying individuals qualified to become members of the board of directors;
- recommending to the board of directors the persons to be nominated for election as directors and to each of the board’s committees;
- reviewing and discussing with the board of directors the corporate succession plans for the Chief Executive Officer and other key officers.
- developing and recommending to the board of directors a set of corporate governance guidelines; and
- overseeing the evaluation of the board of directors and management.

Our board of directors may from time to time establish other committees.

Compensation Committee Interlocks and Insider Participation

None of the members of our compensation committee has at any time during the prior three years been one of our officers or employees, other than Alexis A. Borisy who was our interim CEO from June 2015 to February 2016. None of our executive officers currently serves, or in the past fiscal year has served, as a member of the board of directors or compensation committee of any entity that has one or more executive officers serving on our board of directors or compensation committee.

Corporate Governance

We plan to adopt a code of business conduct and ethics that applies to all of our employees, officers and directors, including those officers responsible for financial reporting, which will be effective upon completion of this offering. Upon the completion of this offering, our code of business conduct and ethics will be available on our website at www.magentatx.com. The inclusion of our website address in this prospectus does not incorporate by reference the information on or accessible through our website into this prospectus. We intend to disclose any substantive amendments to the code, or any waivers of its requirements, on our website or in a Current Report on Form 8-K.

Board Leadership Structure and Board’s Role in Risk Oversight

Michael W. Bonney currently serves as the chair of the board. We believe that the role of a lead independent director allows our Chief Executive Officer to focus on our day-to-day business, while allowing the lead independent director to lead the board of directors in its fundamental role of providing advice to and independent oversight of management. Our board of directors recognizes the time, effort and energy that the Chief Executive Officer is required to devote to his position in the current business environment, as well as the commitment required to serve as our lead independent director, particularly as the board of directors’ oversight responsibilities continue to grow. While our amended and restated bylaws and corporate governance guidelines do not require that we appoint a separate chair and Chief Executive Officer, our board of directors believes that having separate positions is the appropriate leadership structure for us at this time and demonstrates our commitment to good corporate governance.

Risk is inherent with every business, and how well a business manages risk can ultimately determine its success. We face a number of risks, including risks relating to our operations, strategic direction and intellectual property

[Table of Contents](#)

as more fully discussed under “Risk Factors” in this prospectus. Management is responsible for the day-to-day management of risks we face, while our board of directors, as a whole and through its committees, has responsibility for the oversight of risk management. In its risk oversight role, our board of directors has the responsibility to satisfy itself that the risk management processes designed and implemented by management are adequate and functioning as designed.

The role of the board of directors in overseeing the management of our risks is conducted primarily through committees of the board of directors, as disclosed in the descriptions of each of the committees above and in the charters of each of the committees. The full board of directors (or the appropriate board committee in the case of risks that are under the purview of a particular committee) discusses with management our major risk exposures, their potential impact on us, and the steps we take to manage them. When a board committee is responsible for evaluating and overseeing the management of a particular risk or risks, the chair of the relevant committee reports on the discussion to the full board of directors during the committee reports portion of the next board meeting. This enables the board of directors and its committees to coordinate the risk oversight role, particularly with respect to risk interrelationships.

EXECUTIVE COMPENSATION**Executive Compensation Overview**

Our executive compensation program has reflected our growth and development-oriented corporate culture. To date, the compensation of the individuals listed below, whom we refer to as our named executive officers, has primarily consisted of a combination of base salary, bonuses and long-term incentive compensation. Our named executive officers, like all full-time employees, are eligible to participate in our health and welfare benefit plans. As we transition from a private company to a publicly traded company, we will evaluate our compensation values and philosophy and compensation plans and arrangements as circumstances require. At a minimum, we expect to review executive compensation annually with input from a compensation consultant. As part of this review process, we expect the board of directors and the compensation committee to apply our values and philosophy, while considering the compensation levels needed to ensure our executive compensation program remains competitive. We will also review whether we are meeting our retention objectives and the potential cost of replacing a key employee.

Summary Compensation Table

The following table presents information regarding the total compensation awarded to, earned by, and paid to our President and Chief Executive Officer and our next two highest paid executive officers during the year ended December 31, 2017. We refer to these individuals as our named executive officers.

Name and Principal Position	Year	Salary (\$)	Non-Equity Incentive Plan Compensation \$(1)	All Other Compensation \$(2)	Total (\$)
Jason Gardner, D.Phil. <i>President and Chief Executive Officer</i>	2017	405,000	194,400	4,233	603,633
Michael P. Cooke, Ph.D. <i>Chief Scientific Officer</i>	2017	362,500	127,240	6,226	495,966
Bastiano Sanna, Ph.D.(3) <i>Former Chief Operating Officer</i>	2017	310,500	109,920	3,946	424,366

(1) Represents the bonuses paid to our named executive officers based upon company and individual performance objectives in 2017.

(2) Represents the value of company-paid premiums for group term life insurance, and employer contributions to a Health Savings Account.

(3) Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018.

Narrative to Summary Compensation Table**Employment Arrangements with Our Named Executive Officers**

We have entered into an offer letter with each of our named executive officers in connection with their employment with us. Except as noted below, these offer letters provide for “at will” employment.

Jason Gardner, D.Phil.

For the year ended December 31, 2017, the annual base salary for Dr. Gardner was \$405,000. For 2017, Dr. Gardner was eligible to earn an annual cash incentive bonus targeted at 40% of his base salary. Dr. Gardner is also eligible to participate in the employee benefit plans available to our employees, subject to the terms of those plans.

Table of Contents

Pursuant to Dr. Gardner's offer letter dated June 8, 2016, Dr. Gardner was eligible to receive a one-time sign-on bonus of \$25,000 at the closing of the Company's series A financing, which was paid in 2016.

Pursuant to Dr. Gardner's offer letter, in the event that he is terminated by us without "cause", subject to his execution of a separation agreement and general release, he will be entitled to (i) continuation of his base salary for a period of 12 months following his termination of employment, (ii) payment of 12 months of health insurance premiums provided under COBRA for Dr. Gardner and his eligible dependents following his termination of employment at the same rate as we pay for active employees, and (iii) the prorated portion of his target bonus for the fiscal year in which he is terminated, based on the number of days employed during such fiscal year. If Dr. Gardner is employed or consulting more than 50% of his time during the 12 month severance period, the severance payments will discontinue.

Pursuant to Dr. Gardner's offer letter, in the event that Dr. Gardner's employment with the Company is terminated within the 12 month period following or the 30 day period immediately prior to a "change in control" on account of death or "permanent disability", by us without "cause", or as a result of his resignation for "good reason", 100% of his then unvested equity (or outstanding unvested restricted stock and/or options to purchase shares of our common stock) will accelerate and become fully vested.

Michael P. Cooke, Ph.D.

For the year ended December 31, 2017, the annual base salary for Dr. Cooke was \$362,500. For 2017, Dr. Cooke was eligible to earn an annual cash incentive bonus targeted at 30% of his base salary. Dr. Cooke is also eligible to participate in the employee benefit plans available to our employees, subject to the terms of those plans.

Pursuant to Dr. Cooke's offer letter dated May 30, 2016, Dr. Cooke was eligible to receive a relocation bonus of \$150,000, which was paid in 2016. If Dr. Cooke voluntarily leaves the Company, other than for death or disability, within 12 months of receiving the bonus payment, he will be obligated to return the gross amount of the payments to the Company within 30 days of his departure date. Additionally, Dr. Cooke was eligible to receive reimbursements from us for temporary housing for the three months of his employment with the Company.

Pursuant to Dr. Cooke's offer letter, in the event that he is terminated by us without "cause", subject to his execution of a separation agreement and general release, he will be entitled to (i) 6 months of base salary payable in equal installments over 12 months and (ii) payment of 12 months of health insurance premiums provided under COBRA for Dr. Cooke and his eligible dependents following his termination at the same rate as we pay for active employees.

Bastiano Sanna, Ph.D.

For the year ended December 31, 2017, the annual base salary for Dr. Sanna was \$310,500. For 2017, Dr. Sanna was eligible to earn an annual cash incentive bonus targeted at 30% of his base salary. Dr. Sanna was also eligible to participate in the employee benefit plans available to our employees, subject to the terms of those plans.

Pursuant to Dr. Sanna's offer letter dated April 29, 2016, Dr. Sanna was eligible to receive a one-time sign-on bonus of \$50,000 and a relocation bonus of \$30,000, both of which were paid in 2016. If Dr. Sanna had voluntarily left the Company, other than for death or disability, within 12 months of receiving either bonus payment, he would have been obligated to return the gross amount of the payments to the Company within 30 days of his departure date. Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018.

Employee Confidentiality and Assignment Agreements

Each of our named executive officers has entered into a standard form agreement with respect to confidential information and assignment of inventions. Among other things, this agreement obligates each named executive

[Table of Contents](#)

officer to refrain from disclosing any of our proprietary information received during the course of employment and to assign to us any inventions conceived or developed during the course of employment.

Outstanding Equity Awards at Fiscal Year End

The following table presents the outstanding equity awards held by each of our named executive officers as of December 31, 2017:

Name	Stock Awards	
	Number of Shares that Have Not Vested (#)	Market Value of Shares that Have Not Vested (\$)(1)
Jason Gardner, D.Phil.(2) <i>President and Chief Executive Officer</i>	1,250,000	3,725,000
Michael P. Cooke, Ph.D.(3) <i>Chief Scientific Officer</i>	466,172	1,389,193
Bastiano Sanna, Ph.D.(4) <i>Former Chief Operating Officer</i>	388,477	1,157,661

- (1) There was no public market for our common stock as of December 31, 2017. The fair market value of our common stock as of December 31, 2017 was \$2.98 per share.
- (2) Dr. Gardner purchased 2,500,000 shares of restricted stock on November 1, 2016 for \$0.001 per share. 25% of the shares of restricted stock were vested on November 1, 2016, the grant date, and thereafter the remaining shares of restricted stock vest thereafter in 12 equal quarterly installments, subject to his continuous service. All unvested shares of restricted stock shall vest in the event that Dr. Gardner's employment is terminated without cause or on account of death or permanent disability, or Dr. Gardner resigns for good reason (each as defined in Dr. Gardner's offer letter) within the 30 days prior to or 12 months following a sale of the Company.
- (3) Dr. Cooke purchased 745,875 shares of restricted stock on November 1, 2016 for \$0.001 per share. 25% of the shares of restricted stock vested on May 31, 2017, the first anniversary of the vesting commencement date, and the remaining shares vest thereafter in 12 equal quarterly installments, subject to his continuous service.
- (4) Dr. Sanna purchased 621,563 shares of restricted stock on November 1, 2016 for \$0.001 per share. 25% of the shares of restricted stock vested on April 29, 2017, the first anniversary of the vesting commencement date, and the remaining shares vest thereafter in 12 equal quarterly installments, subject to his continuous service. Dr. Sanna resigned as our chief operating officer effective March 30, 2018. However, pursuant to a consultancy agreement we entered into with Dr. Sanna, he continued to serve in an advisory capacity as our consultant through April 30, 2018.

Director Compensation

The following table provides certain information concerning compensation earned by the directors who were not named executive officers during the year ended December 31, 2017.

Name	Fees Earned or Paid in Cash (\$)	Stock Awards (\$)(1)	Option Awards (\$)(1)	All Other Compensation (\$)	Total (\$)
Michael W. Bonney(2)	—	—	—	—	—
Alexis A. Borisy	—	—	—	—	—
Thomas O. Daniel, M.D.(3)	35,000	—	—	—	35,000
Bruce Booth, D.Phil.	—	—	—	—	—
David T. Scadden, M.D.(4)	—	—	—	100,000	100,000
Alison Lawton(5)	22,271	—	170,982	—	193,253
Jeffrey Albers(6)	15,558	—	171,781	—	187,339
Blake Byers, Ph.D.	—	—	—	—	—

- (1) In accordance with SEC rules, these columns reflect the aggregate grant date fair value of the option awards granted during 2017 computed in accordance with Financial Accounting Standard Board ASC Topic 718 for stock-based compensation transactions, or ASC 718. Assumptions used in the calculation of these amounts are included in Note 7 to our financial statements included elsewhere in this prospectus.
- (2) As of December 31, 2017, Mr. Bonney held 312,500 shares of unvested restricted stock.
- (3) Pursuant to a letter agreement with us, Dr. Daniel is paid a cash retainer of \$35,000 as a non-employee director. Pursuant to his letter agreement, he also received an initial grant of a right to purchase shares of restricted common stock representing approximately 0.4% of the Company (assuming a Series A capital raise of \$33 million), vesting in equal quarterly installments over four years from the date he joined the board, subject to his continuous service. Each year thereafter, he is also eligible to receive upon the anniversary of the initial grant or as otherwise determined by the board, an option to purchase 25,000 shares, vesting in equal quarterly installments over one year from the grant date. As of December 31, 2017, Dr. Daniel held 150,000 shares of unvested restricted stock.
- (4) Dr. Scadden was paid \$100,000 in 2017 related to services for the Scientific Advisory Board and did not receive compensation for his role on the Board of Directors. As of December 31, 2017, Dr. Scadden held 958,334 shares of unvested restricted stock.
- (5) Ms. Lawton resigned from our board in February 2018. Pursuant to a letter agreement with us, Ms. Lawton was paid a cash retainer of \$35,000 as a non-employee director, which was prorated in 2017 based on her start date in May 2017. Pursuant to her letter agreement, she also received an initial grant of a stock option to purchase 135,000 shares of common stock, vesting in equal quarterly installments over four years from the date she joined the board, subject to her continuous service. Each year thereafter, she is also eligible to receive upon the anniversary of the initial grant or as otherwise determined by the board, an option to purchase 25,000 shares, vesting in equal quarterly installments over one year from the grant date. As of December 31, 2017, Ms. Lawton held an unexercised option to purchase 135,000 shares of our common stock.
- (6) Pursuant to a letter agreement with us, Mr. Albers is paid an annual cash retainer of \$35,000 as a non-employee director, which was prorated in 2017 based on his start date in July 2017. Pursuant to his letter agreement, he also received an initial grant of a stock option to purchase 135,000 shares of common stock, vesting in equal quarterly installments over four years from the date he joined the board, subject to his continuous service. Each year thereafter, he is also eligible to receive upon the anniversary of the initial grant or as otherwise determined by the board, an option to purchase 25,000 shares, vesting in equal quarterly installments over one year from the grant date. As of December 31, 2017, Mr. Albers held an unexercised option to purchase 135,000 shares of our common stock.

Non-Employee Director Compensation Policy

Our board of directors has adopted a non-employee director compensation policy, effective as of the completion of this offering, that is designed to enable us to attract and retain, on a long-term basis, highly qualified non-employee directors. Under the policy, each director who is not an employee will be paid cash compensation from and after the completion of this offering, as set forth below:

	Annual Retainer
Board of Directors:	
All non-employee members	\$35,000
Audit Committee:	
Chair	\$15,000
Members	\$ 7,500
Compensation Committee:	
Chair	\$10,000
Members	\$ 5,000
Nominating and Corporate Governance Committee:	
Chair	\$ 8,000
Members	\$ 4,000

In addition, each non-employee director will be granted a non-qualified stock option to purchase 94,000 shares of common stock on the date of such director's election or appointment to the board of directors, which will vest 33% on the first anniversary of the grant date, then monthly, in equal annual installments over the two years following the first anniversary of the grant date, subject to continued service as a director. On the date of each annual meeting of stockholders of our company, each continuing non-employee director, other than a director receiving an initial equity award, will be granted a non-qualified stock option to purchase 47,000 shares of common stock, which will vest and become fully exercisable upon the earlier to occur of the first anniversary of the grant date or the date of the next annual meeting of stockholders following the date of grant, subject to continued service as a director through such date.

Compensation Risk Assessment

We believe that although a portion of the compensation provided to our executive officers and other employees is performance-based, our executive compensation program does not encourage excessive or unnecessary risk taking. This is primarily due to the fact that our compensation programs are designed to encourage our executive officers and other employees to remain focused on both short-term and long-term strategic goals, in particular in connection with our pay-for-performance compensation philosophy. As a result, we do not believe that our compensation programs are reasonably likely to have a material adverse effect on our company.

Compensation Plans

2016 Stock Option and Grant Plan

The 2016 Stock Option and Grant Plan, or the 2016 Plan, was approved by our board of directors and our stockholders on November 1, 2016 and amended in April 2017 and April 2018. Under the 2016 Plan, 15,247,857 shares of common stock have been reserved for issuance in the form of incentive stock options, non-qualified stock options, restricted stock, unrestricted stock or any combination of the foregoing. The shares issuable pursuant to awards granted under the 2016 Plan are authorized but unissued shares.

The 2016 Plan is administered by our board or at the discretion of the board, which has full power to select the individuals to whom awards will be granted and to determine the specific terms and conditions of each award, subject to the provisions of the 2016 Plan. Pursuant to the 2016 Plan and subject to applicable law, our board of

[Table of Contents](#)

directors has delegated to the compensation committee the power to make recommendations to the board of directors relating to management compensation, the adoption of employee benefit plans, stock option or equity incentive plans and other similar matters.

The option exercise price of each option granted under the 2016 Plan is determined by our board of directors and may not be less than the fair market value of a share of common stock on the date of grant. The term of each option is fixed by the board and may not exceed 10 years from the date of grant. The board determines at what time or times each option may be exercised when granting the option.

The 2016 Plan provides that, upon the consummation of a sale event, unless provision is made in connection with the sale event for the assumption or continuation of the awards by the successor entity or substitution of the awards with new awards of the successor entity, with appropriate adjustment, the 2016 Plan and all outstanding and unexercised options issued thereunder will terminate upon the effective time of the sale event. We may make or provide for cash payment to holders of options equal to the difference between (i) the per share cash consideration in the sale event multiplied by the number of shares subject to outstanding options being cancelled, and (ii) the aggregate exercise price to the holders of all vested and exercisable options.

Our board of directors may amend the 2016 Plan but no such action may adversely affect the rights of an award holder without such holder's consent. Approval by our stockholders of amendments to the 2016 Plan must be obtained if required by law.

As of March 31, 2018, options to purchase 3,583,000 shares of common stock were outstanding under the 2016 Plan. Our board has determined not to make any further awards under the 2016 Plan following the completion of this offering.

2018 Stock Option and Incentive Plan

The 2018 Stock Option and Incentive Plan, or the 2018 Plan, was adopted by our board of directors in April 2018, and we expect our stockholders will approve the 2018 Plan prior to the completion of this offering. Our 2018 Plan will be effective on the business day immediately prior to the effective date of the registration statement of which this prospectus forms a part and is not expected to be utilized until after the completion of this offering. Our 2018 Plan will provide for the grant of incentive stock options, within the meaning of Section 422 of the Code, to our employees and any of our parent and subsidiary corporations' employees, and for the grant of nonstatutory stock options, restricted stock, restricted stock units, stock appreciation rights, performance units and performance shares to our employees, directors and consultants, and our parent and subsidiary corporations' employees and consultants.

We have initially reserved _____ shares of our common stock, or the Initial Limit, for the issuance of awards under the 2018 Plan. The 2018 Plan provides that the number of shares reserved and available for issuance under the plan will automatically increase each January 1, beginning on January 1, 2019, by 4% of the outstanding number of shares of our common stock on the immediately preceding December 31 or such lesser number of shares as determined by our compensation committee, or the Annual Increase. This number is subject to adjustment in the event of a stock split, stock dividend or other change in our capitalization.

The shares we issue under the 2018 Plan will be authorized but unissued shares or shares that we reacquire. The shares of common stock underlying any awards that are forfeited, cancelled, held back upon exercise or settlement of an award to satisfy the exercise price or tax withholding, reacquired by us prior to vesting, satisfied without any issuance of stock, expire or are otherwise terminated (other than by exercise) under the 2018 Plan and 2018 Plan will be added back to the shares of common stock available for issuance under the 2018 Plan.

The maximum aggregate number of shares that may be issued in the form of incentive stock options shall not exceed the Initial Limit cumulatively increased on January 1, 2019 and on each January 1 thereafter by the lesser of the Annual Increase for such year or _____ shares of common stock.

[Table of Contents](#)

The 2018 Plan will be administered by our compensation committee. Our compensation committee has full power to select, from among the individuals eligible for awards, the individuals to whom awards will be granted, to make any combination of awards to participants, and to determine the specific terms and conditions of each award, subject to the provisions of the 2018 Plan. Persons eligible to participate in the 2018 Plan will be those full or part-time officers, employees, non-employee directors and other key persons (including consultants) as selected from time to time by our compensation committee in its discretion.

The 2018 Plan permits the granting of both options to purchase common stock intended to qualify as incentive stock options under Section 422 of the Code and options that do not so qualify. The option exercise price of each option will be determined by our compensation committee but may not be less than 100% of the fair market value of our common stock on the date of grant. The term of each option will be fixed by our compensation committee and may not exceed 10 years from the date of grant. Our compensation committee will determine at what time or times each option may be exercised.

Our compensation committee may award stock appreciation rights subject to such conditions and restrictions as we may determine. Stock appreciation rights entitle the recipient to shares of common stock, or cash, equal to the value of the appreciation in our stock price over the exercise price. The exercise price of each stock appreciation right may not be less than 100% of the fair market value of our common stock on the date of grant.

Our compensation committee may award shares of restricted common stock and restricted stock units to participants subject to such conditions and restrictions as it may determine. These conditions and restrictions may include the achievement of certain performance goals and continued employment with us through a specified vesting period. Our compensation committee may also grant shares of common stock that are free from any restrictions under the 2018 Plan. Unrestricted stock may be granted to participants in recognition of past services or other valid consideration and may be issued in lieu of cash compensation due to such participant.

Our compensation committee may grant cash bonuses under the 2018 Plan to participants, subject to the achievement of certain performance goals.

The 2018 Plan provides that in the case of, and subject to, the consummation of a “sale event” as defined in the 2018 Plan, all outstanding awards may be assumed, substituted or otherwise continued by the successor entity. To the extent that the successor entity does not assume, substitute or otherwise continue such awards, then upon the effectiveness of the sale event, all stock options and stock appreciation rights will automatically terminate. In the event of such termination, except as may otherwise be provided in the relevant award certificate, all options and stock appreciation rights that are not exercisable immediately prior to the effective time of the sale event shall become fully exercisable as of the effective time of the sale event, all other awards with time based vesting, conditions or restrictions, shall become fully vested and nonforfeitable as of the effective time of the sale event and all awards with conditions and restrictions relating to the attainment of performance goals may become vested and nonforfeitable in the discretion of the administrator or to the extent specified in the relevant award certificate. In addition, in connection with the termination of the 2018 Plan and awards thereunder upon a sale event, we may make or provide for a cash payment to participants holding options and stock appreciation rights equal to the difference between the per share cash consideration payable to stockholders in the sale event and the exercise price of the options or stock appreciation rights or each grantee shall be permitted within a specified period of time prior to the sale event to exercise all outstanding stock options and stock appreciation rights held by such grantee to the extent exercisable.

Our board of directors may amend or discontinue the 2018 Plan and our compensation committee may amend or cancel outstanding awards for purposes of satisfying changes in law or any other lawful purpose, but no such action may adversely affect rights under an award without the holder’s consent. Certain amendments to the 2018 Plan require the approval of our stockholders.

No awards may be granted under the 2018 Plan after the date that is ten years from the date of stockholder approval. No awards under the 2018 Plan have been made prior to the date of this prospectus.

Senior Executive Cash Incentive Bonus Plan

In April 2018, our compensation committee adopted the Senior Executive Cash Incentive Bonus Plan, or the Bonus Plan. The Bonus Plan provides for cash bonus payments based upon the attainment of performance targets established by our compensation committee. The payment targets will be related to financial and operational measures or objectives with respect to our company, or Corporate Performance Goals, as well as individual performance objectives.

Our compensation committee may select Corporate Performance Goals from among the following: cash flow (including, but not limited to, operating cash flow and free cash flow); sales or revenue; corporate revenue; earnings before interest, taxes, depreciation and amortization; net income (loss) (either before or after interest, taxes, depreciation and/or amortization); changes in the market price of our common stock; economic value-added; development, clinical, regulatory or commercial milestones; acquisitions or strategic transactions, partnerships or joint ventures; operating income (loss); return on capital, assets, equity, or investment; stockholder returns; return on sales; gross or net profit levels; productivity; expense efficiency; margins; operating efficiency; customer satisfaction; working capital; earnings (loss) per share of our common stock; sales or market shares; number of customers; operating income and/or other strategic, financial or operational objectives, any of which may be measured in absolute terms, as compared to any incremental increase, in terms of growth, as compared to results of a peer group, against the market as a whole, compared to applicable market indices and/or measured on a pre-tax or post-tax basis.

Each executive officer who is selected to participate in the Bonus Plan will have a target bonus opportunity set for each performance period. The bonus formulas will be adopted in each performance period by the compensation committee and communicated to each executive. The Corporate Performance Goals will be measured at the end of each performance period after our financial reports have been published or such other appropriate time as the compensation committee determines. If the Corporate Performance Goals and individual performance objectives are met, payments will be made as soon as practicable following the end of each performance period. The Bonus Plan also permits the compensation committee to approve additional bonuses to executive officers in its sole discretion.

401(k) Plan and Other Benefits

We maintain a tax-qualified retirement plan, or the 401(k) Plan, that provides eligible U.S. employees with an opportunity to save for retirement on a tax advantaged basis. Eligible employees are able to defer eligible compensation subject to applicable annual Code limits. Employees' pre-tax or Roth contributions are allocated to each participant's individual account and are then invested in selected investment alternatives according to the participants' directions. Employees are immediately and fully vested in their contributions. Our 401(k) Plan is intended to be qualified under Section 401(a) of the Code with our 401(k) Plan's related trust intended to be tax exempt under Section 501(a) of the Code. As a tax-qualified retirement plan, contributions to our 401(k) Plan and earnings on those contributions are not taxable to the employees until distributed from our 401(k) Plan. We may, but are not required to, make matching contributions. We also pay, on behalf of our employees, approximately 80% of the premiums for health, life and disability insurance.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

Other than compensation arrangements, we describe below the transactions, and series of similar transactions, since our inception on June 17, 2015, to which we were a party or will be a party, in which:

- the amounts involved exceeded or will exceed \$120,000; and
- any of our directors, executive officers or holders of more than 5% of our capital stock, or any member of the immediate family of the foregoing persons, had or will have a direct or indirect material interest.

Prior to this offering, we did not have a formal policy concerning transactions with related persons. In connection with this offering, we plan to adopt a written policy, effective upon completion of this offering, that requires all future transactions between us and any director, executive officer, holder of 5% or more of any class of our capital stock or any member of the immediate family of, or entities affiliated with, any of them, or any other related persons (as defined in Item 404 of Regulation S-K) or their affiliates, in which the amount involved is equal to or greater than \$120,000, be approved in advance by our audit committee. Any request for such a transaction must first be presented to our audit committee for review, consideration and approval. In approving or rejecting any such proposal, our audit committee is to consider the relevant facts and circumstances available and deemed relevant to the audit committee, including, but not limited to, the extent of the related party's interest in the transaction, and whether the transaction is on terms no less favorable to us than terms we could have generally obtained from an unaffiliated third party under the same or similar circumstances.

Private Placements of Securities

Common Stock

In February 2016, we issued and sold an aggregate of 5,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$5.00 to Third Rock Ventures III, L.P., or TRV III, and 5,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$5.00 to Atlas Venture Fund X, L.P., or Atlas X. In November 2016, we issued and sold an aggregate of 245,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$245.00 to TRV III and 245,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$245.00 to Atlas X.

[Table of Contents](#)

In November 2016, we issued and sold an aggregate of 2,700,000 shares of our restricted common stock at \$0.001 per share for an aggregate purchase price of \$2,700 to three of our directors, each an accredited investor, of which 2,000,000 shares of our common stock were sold to Dr. Scadden pursuant to a Founders Agreement whereby Dr. Scadden agreed to provide certain services to the Company. In November 2016, we issued and sold an aggregate of 4,127,438 shares of our restricted common stock at \$0.001 per share to four executive officers in exchange for services to us. In March 2017, we issued and sold an aggregate of 350,000 shares of our restricted common stock at \$0.01 per share for an aggregate purchase price of \$3,500 to one executive officer in exchange for services to us. The following table summarizes purchases of our common stock by related persons.

Stockholder	Affiliated Director(s) or Officer(s)	Shares of Common Stock	Aggregate Purchase Price
5% Stockholders:			
Third Rock Ventures IV, L.P.(1)	Alexis A. Borisy	250,000	\$ 250
Atlas Venture Fund X, L.P.(2)	Bruce Booth, D.Phil.	250,000	\$ 250
Directors and Executive Officers:			
Jason Gardner, D, Phil.(3)		2,500,000	\$ 2,500
David T. Scadden, M.D.(4)		2,000,000	\$ 2,000
Michael W. Bonney		500,000	\$ 500
Thomas O. Daniel, M.D.		200,000	\$ 200
Bastiano Sanna, Ph.D.(5)		621,563	\$ 622
Michael P. Cooke, Ph.D.		745,875	\$ 746
Christina K. Isacson, Ph.D.		260,000	\$ 260
Zoran Zdraveski, J.D., Ph.D.		350,000	\$ 3,500

- (1) In January 2017, TRV III transferred all of its shares in Magenta to Third Rock Ventures IV, L.P. or TRV IV. TRV IV is an affiliate fund of Third Rock Ventures, LLC, or TRV, and is a holder of five percent or more of our capital stock. Alexis Borisy is a partner at TRV and a member of our board of directors.
- (2) Atlas X is an affiliate fund of Atlas Venture Associates X, LLC, or Atlas, and is a holder of five percent or more of our capital stock. Bruce Booth is a partner at Atlas and a member of our board of directors.
- (3) 1,250,000 of Dr. Gardner's shares were transferred to trusts in December 2017.
- (4) 1,500,000 of Dr. Scadden's shares were issued to a trust in November 2016.
- (5) Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018.

[Table of Contents](#)

Series A Preferred Stock Financing

In November 2016, with a subsequent closing in April 2017, we issued and sold an aggregate of 35,663,974 shares of Series A preferred stock at a purchase price of \$1.00 per share. Certain investors holding convertible notes issued in 2015 and 2016 used such notes to purchase our Series A preferred stock. Each share of our Series A preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering. The following table summarizes purchases of our Series A preferred stock by related persons:

Name	Shares of Series A Preferred	Aggregate Purchase Price Paid
Third Rock Ventures IV, L.P. ⁽¹⁾	20,102,478	\$20,102,478 ⁽²⁾
Atlas Venture Fund X, L.P. ⁽³⁾	12,061,496	\$12,061,496 ⁽⁴⁾
GV 2016, L.P. ⁽⁵⁾	133,400	\$ 133,400
Jason Gardner, D.Phil.	66,700	\$ 66,700
David T. Scadden, M.D.	50,025	\$ 50,025
Michael W. Bonney	50,025	\$ 50,025
Thomas O. Daniel, M.D.	33,350	\$ 33,350
Bastiano Sanna, Ph.D. ⁽⁶⁾	50,025	\$ 50,025
Michael P. Cooke, Ph.D.	10,005	\$ 10,005
Christina K. Isacson, Ph.D.	6,670	\$ 6,670

- (1) TRV IV is an affiliate fund of TRV and is a holder of five percent or more of our capital stock. Alexis Borisy is a partner at TRV and a member of our board of directors.
- (2) \$4,477,489 of TRV IV's purchase price was funded by the cancellation or conversion of indebtedness (including principal and interest) under certain convertible promissory notes, issued by us to TRV III from December 2015 to September 2016. TRV III transferred their 4,477,489 shares of Series A preferred stock to TRV IV on January 30, 2017.
- (3) Atlas X is an affiliate fund of Atlas Venture Associates X, LLC, or Atlas, and is a holder of five percent or more of our capital stock. Bruce Booth is a partner at Atlas and a member of our board of directors.
- (4) \$2,686,495 of Atlas X's purchase price was funded by the cancellation or conversion of indebtedness (including principal and interest) under certain convertible promissory notes, issued by us to Atlas X from December 2015 to September 2016.
- (5) GV 2016, L.P., an affiliate fund of GV, is a holder of five percent or more of our capital stock. Blake Byers is a partner at GV and a member of our board of directors.
- (6) Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018.

[Table of Contents](#)

Series B Preferred Stock Financing

In April 2017, with a subsequent closing in June 2017, we issued and sold an aggregate of 13,514,553 shares of Series B preferred stock at a purchase price of \$3.8847 per share. Each share of our Series B preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering. The following table summarizes purchases of our Series B preferred stock by related persons:

Name	Shares of Series B Preferred	Aggregate Purchase Price Paid
Third Rock Ventures IV, L.P.(1)	340,566	\$ 1,322,997
Atlas Venture Fund X, L.P.(2)	204,339	\$ 793,796
GV 2016, L.P. (3)	8,494,864	\$ 32,999,998
Be the Match BioTherapies, LLC(4)	1,287,100	\$ 4,999,997
Jason Gardner, D.Phil.	34,314	\$ 133,300
David T. Scadden, M.D.	6,429	\$ 24,975
Michael W. Bonney	6,429	\$ 24,975
Thomas O. Daniel, M.D.	30,028	\$ 116,650
Bastiano Sanna, Ph.D.(5)	19,300	\$ 74,975
Michael P. Cooke, Ph.D.	1,287	\$ 5,000
Christina K. Isacson, Ph.D.	857	\$ 3,329

- (1) TRV IV is an affiliate fund of TRV and is a holder of five percent or more of our capital stock. Alexis Borisy is a partner at TRV and a member of our board of directors.
- (2) Atlas X is an affiliate fund of Atlas Venture Associates X, LLC, or Atlas, and is a holder of five percent or more of our capital stock. Bruce Booth is a partner at Atlas and a member of our board of directors.
- (3) GV 2016, L.P., an affiliate fund of GV, and is a holder of five percent or more of our capital stock. Blake Byers is a partner at GV and a member of our board of directors.
- (4) Amy L. Ronneberg is the President of Be The Match BioTherapies, LLC and became a member of our board effective March 6, 2018.
- (5) Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018.

Series C Preferred Stock Financing

In April 2018, we issued and sold an aggregate of 11,223,102 shares of Series C preferred stock at a purchase price of \$4.66 per share. Each share of our Series C preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering. The following table summarizes purchases of our Series C preferred stock by related persons:

Name	Shares of Series C Preferred	Aggregate Purchase Price Paid
Be The Match BioTherapies, LLC.(1)	246,781	\$ 1,149,999
Entities Affiliated with Casdin Partners, LP(2)	2,682,402	\$ 12,499,993
Jason Gardner, D.Phil.	21,459	\$ 99,999
David T. Scadden, M.D.	16,094	\$ 74,998
Jeffrey Albers	10,729	\$ 49,997
Bastiano Sanna, Ph.D.(3)	21,459	\$ 99,999
Zoran Zdraveski, J.D., Ph.D.	12,000	\$ 55,920
John C. Davis, Jr., M.D.	21,459	\$ 99,999

- (1) Amy L. Ronneberg is the President of Be The Match BioTherapies, LLC and a member of our board of directors.
- (2) Entities affiliated with Casdin Partners, LP holding our securities whose shares are aggregated for purposes of reporting share ownership information includes Casdin Partners Master Fund, LP and Casdin Venture Opportunities Fund, L.P.
- (3) Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018.

License Agreement with Novartis

In April 2017, we entered into a license agreement with Novartis pursuant to which we were granted a worldwide license to certain intellectual property rights owned or controlled by Novartis, including patents, patent applications, proprietary information, know-how and other intellectual property, to develop, commercialize and sell one or more therapeutic products comprising research, develop and commercialize certain Novartis compounds for expansion of cord blood derived non-gene-edited/-modified HSCs. See “Business—Licenses and Collaboration—Alliance with Novartis.” As additional consideration for the license, we issued to Novartis 2,500,000 shares of Series A preferred stock and 643,550 shares of Series B preferred stock, which we determined to have a total fair value of approximately \$9.3 million. Novartis was a beneficial owner of 5% or more of our outstanding shares of our capital stock until our Series C preferred stock financing.

Agreements with Stockholders

In connection with the Series C preferred stock financing, we entered into the Second Amended and Restated Investors’ Rights Agreement, or the Investors’ Rights Agreement, dated as of April 2, 2018, with certain of our stockholders, including our principal stockholders and their affiliates and the Second Amended and Restated Stockholders Agreement, dated as of April 2, 2018, with certain of our stockholders, including our principal stockholders and their affiliates. All of the material provisions of these agreements will terminate immediately prior to the completion of this offering, other than the provisions relating to registration rights, which will continue in effect following the completion of this offering and entitle the holders of such rights to have us register their shares of our common stock for sale in the U.S. See “Description of Capital Stock—Registration Rights.”

Management and Consulting Services

During the years ended December 31, 2016 and 2017, we received consulting, advisory and related services from TRV in the amount of \$447,869 and \$144,345, respectively. TRV is a management company that provides services to us and TRV III is the beneficial owner of more than 5% of our voting securities. Alexis A. Borisy is a partner at TRV and a member of our board of directors. These consulting fees were paid to TRV in amounts mutually agreed upon in advance by us and TRV in consideration of certain strategic and ordinary course business operations and such services were provided to us on an as-needed basis, from time to time and at our request, by individuals related to TRV. Such fees were payable pursuant to invoices submitted to us by TRV from time to time. None of these consulting fees were paid directly to Mr. Borisy. The consulting fees paid to TRV did not exceed 5% of the consolidated gross revenue of TRV during any of these fiscal years.

During the years ended December 31, 2016 and 2017, we received consulting, advisory and related services from Atlas Venture Life Science Advisors LLC, or Atlas Venture, in the amount of \$619,558 and \$4,327, respectively. Atlas Venture, through its affiliate Atlas X, has a greater than 5% ownership interest in us. Bruce Booth, D.Phil., is a member of our board of directors and is a partner at Atlas Venture. These consulting fees were paid to Atlas Venture in amounts mutually agreed upon in advance by us and Atlas Venture in consideration of certain strategic and ordinary course business operations and such services were provided to us on an as-needed basis, from time to time and at our request, by individuals related to Atlas Venture. Such fees were payable pursuant to invoices submitted to us by Atlas Venture from time to time. None of these consulting fees were paid directly to Dr. Booth. The consulting fees paid to Atlas Venture did not exceed 5% of the consolidated gross revenue of Atlas Venture during any of these fiscal years.

Collaboration and Advisory Services

During the year ended December 31, 2017, we received advisory and related services from Be the Match BioTherapies, LLC, or BTMB, and its affiliates in the amount of \$146,124. We have a collaboration agreement with BTMB and a research agreement with an affiliated organization, Center for International Blood and Marrow

[Table of Contents](#)

Transplant Research. Amy L. Ronneberg is the president of BTMB and a member of our board of directors. These fees were paid to BTMB in amounts mutually agreed upon in advance by us and BTMB. None of these fees were paid directly to Ms. Ronneberg. The fees paid to BTMB did not exceed 5% of the consolidated gross revenue of BTMB during fiscal year 2017.

Executive Officer and Director Compensation

See “Executive Compensation” for information regarding compensation of directors and executive officers.

Employment Agreements

We have entered into offer letters or employment agreements with each of our executive officers. For more information regarding our agreements with our named executive officers for the fiscal year ended December 31, 2017, see “Executive Compensation—Narrative to Summary Compensation Table—Employment Arrangements with Our Named Executive Officers.”

Director Agreements

Indemnification Agreements

We have entered into or plan to enter into indemnification agreements with each of our directors and executive officers, the form of which is attached as an exhibit to the registration statement of which this prospectus is a part. The indemnification agreements and our amended and restated certificate of incorporation and amended and restated bylaws require us to indemnify our directors and officers to the fullest extent permitted by Delaware law.

PRINCIPAL STOCKHOLDERS

The following table presents information concerning the beneficial ownership of the shares of our common stock as of April 30, 2018, by:

- each person we know to be the beneficial owner of 5% or more of our outstanding shares of our capital stock;
- each of our directors;
- each of our named executive officers; and
- all of our executive officers and directors as a group.

We have determined beneficial ownership in accordance with SEC rules. The information does not necessarily indicate beneficial ownership for any other purpose. Under these rules, a person is deemed to be a beneficial owner of our common stock if that person has a right to acquire ownership within 60 days by the exercise of options or the conversion of our redeemable convertible preferred stock. A person is also deemed to be a beneficial owner of our common stock if that person has or shares voting power, which includes the power to vote or direct the voting of our common stock, or investment power, which includes the power to dispose of or to direct the disposition of such capital stock. Except in cases where community property laws apply or as indicated in the footnotes to this table, we believe that each stockholder identified in the table possesses sole voting and investment power over all shares of common stock shown as beneficially owned by the stockholder.

Table of Contents

Percentage of beneficial ownership in the table below is based on 71,585,700 shares of common stock deemed to be outstanding as of April 30, 2018, assuming the conversion of all outstanding shares of redeemable convertible preferred stock into an aggregate of 60,401,629 shares of common stock upon the completion of this offering, and the percentage of beneficial ownership after this offering in the table below is based on _____ shares of common stock assumed to be outstanding after the completion of this offering. The table below assumes that the underwriters do not exercise their option to purchase additional shares. If the underwriters exercise their option to purchase additional shares in full, we will sell an aggregate of _____ additional shares of common stock. The table below does not reflect any shares of common stock that directors and executive officers may purchase in this offering through the directed share program described under “Underwriting—Directed Share Program.” Shares of common stock subject to options that are currently exercisable or exercisable within 60 days of April 30, 2018 are considered outstanding and beneficially owned by the person holding the options for the purpose of computing the percentage ownership of that person but are not treated as outstanding for the purpose of computing the percentage ownership of any other person. Unless otherwise indicated below, the address of each individual listed below is c/o Magenta Therapeutics, Inc., 50 Hampshire Street, 8th Floor, Cambridge, MA 02139.

<u>Name and Address of Beneficial Owner</u>	<u>Number of Shares Beneficially Owned before Offering</u>	<u>Percentage of Shares Beneficially Owned before Offering</u>	<u>Percentage of Shares Beneficially Owned after Offering</u>
5% or Greater Stockholders:			
Third Rock Ventures IV, L.P.(1)	20,693,044	28.91%	%
Atlas Venture X, L.P.(2)	12,515,835	17.48%	%
GV 2016, L.P.(3)	8,628,264	12.05%	%
Entities Affiliated with Casdin Partners, LP(4)	4,226,922	5.90%	%
Named Executive Officers and Directors:			
Jason Gardner, D.Phil.(5)	2,634,973	3.68%	%
Michael P. Cooke, Ph.D.(6)	767,898	1.07%	%
Bastiano Sanna, Ph.D.(7)	412,296	*%	%
Jeffrey Albers(8)	36,041	*%	%
Michael W. Bonney(9)	556,454	*%	%
Bruce Booth, D.Phil.(2)	—	— %	%
Alexis A. Borisy(1)	—	— %	%
Blake Byers, Ph.D.(3)(10)	—	— %	%
Thomas O. Daniel, M.D.(11)	263,378	*%	%
Amy Ronneberg	—	— %	%
David T. Scadden, M.D.(12)	2,072,548	2.90%	%
All executive officers and directors as a group (fifteen persons)(13)	7,470,585	10.42%	%

* Represents beneficial ownership of less than one percent.

- (1) Consists of: (i) 250,000 shares of common stock held by Third Rock Ventures IV, L.P., or TRV IV; (ii) 20,102,478 shares of common stock issuable upon conversion of shares of Series A preferred stock held by TRV IV; and (iii) 340,566 shares of common stock issuable upon conversion of shares of Series B preferred stock held by TRV IV. The general partner of TRV IV is Third Rock Ventures GP IV, L.P., or TRV GP IV LP. The general partner of TRV GP IV LP is TRV GP IV, LLC, or TRV GP IV LLC. Abbie Celniker, Ph.D., Robert Tepper, M.D., Alexis Borisy, Craig Muir and Cary Pfeffer, M.D. are the managing members of TRV GP IV LLC who collectively make voting and investment decisions with respect to shares held by TRV IV.
- (2) Consists of: (i) 250,000 shares of common stock; (ii) 12,061,496 shares of common stock issuable upon conversion of shares of Series A preferred stock held by Atlas Venture Associates X, LP, or Atlas X, and (iii) 204,339 shares of common stock issuable upon conversion of shares of Series B preferred stock held by Atlas X. All shares are held directly by Atlas X. Atlas Venture Associates X, L.P., or Atlas Associates X, is the general partner of Atlas X, and Atlas Venture Associates X, LLC, or AVA X, is the general partner of

Table of Contents

Atlas Associates X. Peter Barrett, Bruce Booth, Jean-François Formela, David Grayzel and Jason Rhodes are the members of AVA X and collectively make investment decisions on behalf of Atlas X. Dr. Booth is also a member of our board of directors. Dr. Booth disclaims beneficial ownership of such shares, except to the extent of his pecuniary interest therein, if any. The address for Atlas X is 400 Technology Square, 10th Floor, Cambridge, Massachusetts 02139.

- (3) Consists of: (i) 133,400 shares of common stock issuable upon conversion of shares of Series A preferred stock held by GV 2016, L.P. and (ii) 8,494,864 shares of common stock issuable upon conversion of shares of Series B preferred stock held by GV 2016, L.P. GV 2016 GP, L.P., the general partner of GV 2016, L.P., GV 2016 GP L.L.C., the general partner of GV 2016 GP, L.P., Alphabet Holdings LLC, the sole member of GV 2016 GP L.L.C., XXVI Holdings Inc., the managing member of Alphabet Holdings LLC, and Alphabet Inc., the sole stockholder of XXVI Holdings Inc., may each be deemed to have sole power to vote or dispose of these shares. The principal business address of GV 2016, L.P., GV 2016 GP, L.P., GV 2016 GP L.L.C., Alphabet Holdings LLC, XXVI Holdings Inc., and Alphabet Inc. is 1600 Amphitheatre Parkway, Mountain View, California 94043.
- (4) Consists of (i) 1,544,520 shares of common stock issuable upon conversion of shares of Series B preferred stock held by Casdin Partners Master Fund, LP, or Casdin Master Fund, (ii) 1,899,141 shares of common stock issuable upon conversion of shares of Series C preferred stock held by Casdin Master Fund and (iii) 783,261 shares of common stock issuable upon conversion of shares of Series C preferred stock held by Casdin Venture Opportunities Fund, LP.
- (5) Consists of: (i) 2,500,000 shares of common stock, (ii) 12,500 shares of common stock underlying options exercisable within 60 days of April 30, 2018, (iii) 66,700 shares of common stock issuable upon conversion of shares of Series A preferred stock, (iv) 34,314 shares of common stock issuable upon conversion of shares of Series B preferred stock and (v) 21,459 shares of common stock issuable upon conversion of shares of Series C preferred stock. 1,250,000 of Dr. Gardner's shares of common stock and all of his shares of Series A preferred stock and Series B preferred stock were transferred to trusts in December 2017.
- (6) Consists of: (i) 745,875 shares of restricted common stock, (ii) 10,731 shares of common stock underlying options exercisable within 60 days of April 30, 2018, (iii) 10,005 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iv) 1,287 shares of common stock issuable upon conversion of shares of Series B preferred stock.
- (7) Consists of: (i) 310,781 shares of restricted common stock, (ii) 10,731 shares of common stock underlying options exercisable within 60 days of April 30, 2018, (iii) 50,025 shares of common stock issuable upon conversion of shares of Series A preferred stock, (iv) 19,300 shares of common stock issuable upon conversion of shares of Series B preferred stock and (v) 21,459 shares of common stock issuable upon conversion of shares of Series C preferred stock. Dr. Sanna resigned as our chief operating officer effective March 30, 2018. He continued to serve in an advisory capacity as our consultant through April 30, 2018 and his options and restricted stock continued to vest as scheduled during this period under the 2016 Plan.
- (8) Consists of: (i) 25,312 shares of common stock underlying options exercisable within 60 days of April 30, 2018 and (ii) 10,729 shares of common stock issuable upon conversion of shares of Series C preferred stock.
- (9) Consists of: (i) 500,000 shares of restricted common stock, (ii) 50,025 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iii) 6,429 shares of common stock issuable upon conversion of shares of Series B preferred stock.
- (10) Excludes shares listed in footnote 3 above, which are held by GV 2016, L.P. Dr. Byers is a partner at GV and a member of our board of directors, but does not have voting or dispositive power over the shares held by GV 2016, L.P.
- (11) Consists of: (i) 200,000 shares of restricted common stock; (ii) 33,350 shares of common stock issuable upon conversion of shares of Series A preferred stock and (iii) 30,028 shares of common stock issuable upon conversion of shares of Series B preferred stock.
- (12) Consists of: (i) 2,000,000 shares of common stock, (ii) 50,025 shares of common stock issuable upon conversion of the Series A preferred stock, (iii) 6,429 shares of common stock issuable upon conversion of shares of Series B preferred stock and (iv) 16,094 shares of common stock issuable upon conversion of shares of Series C preferred stock. 1,500,000 of Dr. Scadden's shares of common stock were issued to a trust in November 2016.
- (13) See notes 5 through 12 above; also includes Christina K. Isacson, Zoran Zdraveski and John C. Davis, Jr., who are executive officers but not named executive officers, and Cindy Driscoll, our principal financial officer.

DESCRIPTION OF CAPITAL STOCK

Upon the completion of this offering and after giving effect to the conversion into common stock and retirement of all outstanding shares of our redeemable convertible preferred stock, our authorized capital stock will consist of 150,000,000 shares of common stock, par value \$0.001 per share, and 10,000,000 shares of preferred stock, par value \$0.001 per share, all of which will be undesignated, and there will be _____ shares of common stock outstanding and no shares of preferred stock outstanding. As of April 30, 2018, we had approximately 70 record holders of our capital stock. All of our outstanding shares of redeemable convertible preferred stock will convert into shares of our common stock upon the completion of this offering. In addition, upon the completion of this offering, options to purchase shares of our common stock will be outstanding and _____ shares of our common stock will be reserved for future grants under our equity incentive plans.

The following description of our capital stock and provisions of our amended and restated certificate of incorporation and amended and restated bylaws are summaries of material terms and provisions and are qualified by reference to our amended and restated certificate of incorporation and amended and restated bylaws, copies of which have been filed with the SEC as exhibits to the registration statement of which this prospectus is a part. The descriptions of our common stock and preferred stock reflect amendments to our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering.

Common Stock

Upon the completion of this offering, we will be authorized to issue one class of common stock. Holders of our common stock are entitled to one vote for each share of common stock held of record for the election of directors and on all matters submitted to a vote of stockholders. Holders of our common stock are entitled to receive dividends ratably, if any, as may be declared by our board of directors out of legally available funds, subject to any preferential dividend rights of any preferred stock then outstanding. The holders of our common stock do not have any cumulative voting rights. Upon our dissolution, liquidation or winding up, holders of our common stock are entitled to share ratably in our net assets legally available after the payment of all our debts and other liabilities, subject to the preferential rights of any preferred stock then outstanding. Holders of our common stock have no preemptive, subscription, redemption or conversion rights and no sinking fund provisions are applicable to our common stock. The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future. Except as described under “Antitakeover Effects of Delaware Law and Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws” below, a majority vote of the holders of common stock is generally required to take action under our amended and restated certificate of incorporation and amended and restated bylaws.

Preferred Stock

Upon the completion of this offering, our board of directors will be authorized, without action by the stockholders, to designate and issue up to an aggregate of 10,000,000 shares of preferred stock in one or more series. Our board of directors can designate the rights, preferences and privileges of the shares of each series and any of its qualifications, limitations or restrictions. Our board of directors may authorize the issuance of preferred stock with voting or conversion rights that could adversely affect the voting power or other rights of the holders of common stock. The issuance of preferred stock, while providing flexibility in connection with possible future financings and acquisitions and other corporate purposes could, under certain circumstances, have the effect of restricting dividends on our common stock, diluting the voting power of our common stock, impairing the liquidation rights of our common stock, or delaying, deferring or preventing a change in control of our company, which might harm the market price of our common stock. See also “Antitakeover Effects of Delaware Law and Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws—Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws—Undesignated preferred stock” below.

[Table of Contents](#)

Our board of directors will make any determination to issue such shares based on its judgment as to our company's best interests and the best interests of our stockholders. Upon the completion of this offering, we will have no shares of preferred stock outstanding and we have no current plans to issue any shares of preferred stock following completion of this offering.

Registration Rights

Upon the completion of this offering, the holders of 60,401,629 shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock, or their permitted transferees, which we refer to as our registrable securities, are entitled to rights with respect to the registration of these securities under the Securities Act. These rights are provided under the terms of the Investors' Rights Agreement. The Investors' Rights Agreement includes demand registration rights, short-form registration rights and piggyback registration rights. All fees, costs and expenses incurred in connection with registrations under the Investors' Rights Agreement will be borne by us, and all selling expenses, including underwriting discounts and selling commissions, will be borne by the holders of the shares being registered.

Demand Registration Rights

Upon the completion of this offering, the holders of our registrable securities are entitled to demand registration rights. Under the terms of the investor rights agreement, we will be required, upon the request of holders of at least 25% of our outstanding registrable securities, to file a registration statement with an anticipated offering amount of at least \$3.0 million and use commercially reasonable efforts to effect the registration of these shares for public resale. We are required to effect up to two registrations pursuant to this provision of the Investors' Rights Agreement. A demand for registration may not be made until six months after the effective date of the registration statement for this offering.

Short Form Registration Rights

Upon the completion of this offering, the holders of our registrable securities are also entitled to short form registration rights. Pursuant to the Investors' Rights Agreement, if we are eligible to file a registration statement on Form S-3, upon the request of holders of at least 10% of our outstanding registrable securities to sell registrable securities with an anticipated aggregate offering amount of at least \$1.0 million, we will be required to use our commercially reasonable efforts to effect a registration of such shares. We are required to effect up to two registrations in any twelve month period pursuant to this provision of the Investors' Rights Agreement.

Piggyback Registration Rights

The holders of our registrable securities are entitled to piggyback registration rights. If we register any of our securities either for our own account or for the account of other security holders, the holders of our outstanding registrable securities are entitled to include their shares in the registration. Subject to certain exceptions contained in the Investors' Rights Agreement, we and the underwriters may limit the number of shares included in the underwritten offering if the underwriters determine that marketing factors require a limitation of the number of shares to be underwritten.

Indemnification

Our Investors' Rights Agreement contains customary cross-indemnification provisions, under which we are obligated to indemnify holders of registrable securities in the event of material misstatements or omissions in the registration statement attributable to us, and they are obligated to indemnify us for material misstatements or omissions attributable to them.

Expiration of Registration Rights

The registration rights granted under the investor rights agreement will terminate upon the earlier of (i) a deemed liquidation event, as defined in our amended and restated certificate of incorporation (as in effect prior to the completion of this offering) or certain other events constituting a sale of the company, (ii) at such time after our initial public offering when all registrable securities could be sold under Rule 144 of the Securities Act or a similar exemption without limitation during a three-month period without registration or (iii) the fifth anniversary of our initial public offering.

Antitakeover Effects of Delaware Law and Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Certain provisions of the Delaware General Corporation Law and of our amended and restated certificate of incorporation and amended and restated bylaws that will become effective upon the completion of this offering could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids and, as a consequence, they might also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our board of directors. These provisions might also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Delaware Anti-Takeover Statute

Upon completion of this offering, we will be subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited unless it satisfies one of the following conditions:

- before the stockholder became interested, our board of directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;
- upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances, but not the outstanding voting stock owned by the interested stockholder; or
- at or after the time the stockholder became interested, the business combination was approved by our board of directors and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

Section 203 defines a business combination to include:

- any merger or consolidation involving the corporation and the interested stockholder;
- any sale, transfer, lease, pledge, exchange, mortgage or other disposition involving the interested stockholder of 10% or more of the assets of the corporation;

Table of Contents

- subject to exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; or
- the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

In general, Section 203 defines an interested stockholder as any entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with or controlling or controlled by the entity or person.

Choice of Forum

Our amended and restated bylaws to become effective upon the closing of this offering provide that, unless we consent in writing to an alternative forum, the Court of Chancery of the State of Delaware will be the sole and exclusive forum for (i) any derivative action or proceeding brought on our behalf, (ii) any action asserting a claim of or based on a breach of a fiduciary duty owed by any of our current or former directors, officers and employees to us or our stockholders, (iii) any action asserting a claim against us or any of our current or former directors, officers, employees or stockholders arising pursuant to any provision of the Delaware General Corporation Law, our amended and restated certificate of incorporation or our amended and restated bylaws, or (iv) any action asserting a claim that is governed by the internal affairs doctrine, in each case subject to the Court of Chancery having personal jurisdiction over the indispensable parties named as defendants therein. Our amended and restated bylaws further provide that, unless we consent in writing to an alternative forum, the United States District Court for the District of Massachusetts will be the exclusive forum for resolving any complaint asserting a cause of action arising under the Securities Act. We have chosen the United States District Court for the District of Massachusetts as the exclusive forum for such causes of action because our principal executive offices are located in Cambridge, Massachusetts. Some companies that have adopted similar federal district court forum selection provisions are currently subject to a suit in the Court of Chancery of the State of Delaware by stockholders who assert that the federal district court forum selection provision is not enforceable. We recognize that the federal district court forum selection clause may impose additional litigation costs on stockholders who assert the provision is not enforceable and may impose more general additional litigation costs in pursuing any such claims, particularly if the stockholders do not reside in or near the Commonwealth of Massachusetts. Additionally, the forum selection clauses in our amended and restated bylaws may limit our stockholders' ability to obtain a favorable judicial forum for disputes with us. Alternatively, if the federal district court forum selection provision is found inapplicable to, or unenforceable in respect of, one or more of the specified types of actions or proceedings, we may incur additional costs associated with resolving such matters in other jurisdictions, which could have an adverse effect on our business, financial condition or results of operations. The United States District Court for the District of Massachusetts may also reach different judgments or results than would other courts, including courts where a stockholder considering an action may be located or would otherwise choose to bring the action, and such judgments may be more or less favorable to us than our stockholders. Although we believe this provision benefits us by providing increased consistency in the application of Delaware law in the types of lawsuits to which it applies, the provision may have the effect of discouraging lawsuits against our directors and officers.

Provisions of our Amended and Restated Certificate of Incorporation and Amended and Restated Bylaws

Our amended and restated certificate of incorporation and amended and restated bylaws to be in effect upon completion of this offering will include a number of provisions that may have the effect of delaying, deferring or discouraging another party from acquiring control of us and encouraging persons considering unsolicited tender offers or other unilateral takeover proposals to negotiate with our board of directors rather than pursue non-negotiated takeover attempts. These provisions include the items described below.

Board composition and filling vacancies. In accordance with our amended and restated certificate of incorporation, our board is divided into three classes serving staggered three-year terms, with one class being

[Table of Contents](#)

elected each year. Our amended and restated certificate of incorporation also provides that directors may be removed only for cause and then only by the affirmative vote of the holders of two-thirds or more of the shares then entitled to vote at an election of directors. Furthermore, any vacancy on our board of directors, however occurring, including a vacancy resulting from an increase in the size of our board, may only be filled by the affirmative vote of a majority of our directors then in office even if less than a quorum.

No written consent of stockholders. Our amended and restated certificate of incorporation provides that all stockholder actions are required to be taken by a vote of the stockholders at an annual or special meeting, and that stockholders may not take any action by written consent in lieu of a meeting. This limit may lengthen the amount of time required to take stockholder actions and would prevent the amendment of our bylaws or removal of directors by our stockholder without holding a meeting of stockholders.

Meetings of stockholders. Our bylaws provide that only a majority of the members of our board of directors then in office may call special meetings of stockholders and only those matters set forth in the notice of the special meeting may be considered or acted upon at a special meeting of stockholders. Our bylaws limit the business that may be conducted at an annual meeting of stockholders to those matters properly brought before the meeting.

Advance notice requirements. Our bylaws establish advance notice procedures with regard to stockholder proposals relating to the nomination of candidates for election as directors or new business to be brought before meetings of our stockholders. These procedures provide that notice of stockholder proposals must be timely given in writing to our corporate secretary prior to the meeting at which the action is to be taken. Generally, to be timely, notice must be received at our principal executive offices not less than 90 days or more than 120 days prior to the first anniversary date of the annual meeting for the preceding year. The notice must contain certain information specified in our bylaws.

Amendment to certificate of incorporation and bylaws. As required by the Delaware General Corporation Law, any amendment of our amended and restated certificate of incorporation must first be approved by a majority of our board of directors, and if required by law or our amended and restated certificate of incorporation, must thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon as a class, except that the amendment of the provisions relating to stockholder action, directors, limitation of liability and the amendment of our amended and restated certificate of incorporation must be approved by not less than two-thirds of the outstanding shares entitled to vote on the amendment, and not less than two-thirds of the outstanding shares of each class entitled to vote thereon as a class. Our bylaws may be amended by the affirmative vote of a majority vote of the directors then in office, subject to any limitations set forth in the bylaws; and may also be amended by the affirmative vote of at least two-thirds of the outstanding shares entitled to vote on the amendment, or, if the board of directors recommends that the stockholders approve the amendment, by the affirmative vote of the majority of the outstanding shares entitled to vote on the amendment, in each case voting together as a single class.

Undesignated preferred stock. Our amended and restated certificate of incorporation provides for authorized shares of preferred stock. The existence of authorized but unissued shares of preferred stock may enable our board of directors to render more difficult or to discourage an attempt to obtain control of us by means of a merger, tender offer, proxy contest or otherwise. For example, if in the due exercise of its fiduciary obligations, our board of directors were to determine that a takeover proposal is not in the best interests of us or our stockholders, our board of directors could cause shares of preferred stock to be issued without stockholder approval in one or more private offerings or other transactions that might dilute the voting or other rights of the proposed acquirer or insurgent stockholder or stockholder group. In this regard, our amended and restated certificate of incorporation grants our board of directors broad power to establish the rights and preferences of authorized and unissued shares of preferred stock. The issuance of shares of preferred stock could decrease the amount of earnings and assets available for distribution to holders of shares of common stock. The issuance may also adversely affect the rights and powers, including voting rights, of these holders and may have the effect of delaying, deterring or preventing a change in control of us.

[Table of Contents](#)

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is . The transfer agent and registrar’s address is .

Listing

We have applied to list our common stock on The NASDAQ Global Market under the symbol “MGTA.”

SHARES ELIGIBLE FOR FUTURE SALE

Prior to this offering, there has been no public market for our common stock. Future sales of our common stock in the public market, or the availability of such shares for sale in the public market, could adversely affect market prices prevailing from time to time. As described below, only a limited number of shares will be available for sale shortly after this offering due to contractual and legal restrictions on resale. Nevertheless, sales of our common stock in the public market after such restrictions lapse, or the perception that those sales may occur, could adversely affect the prevailing market price at such time and our ability to raise equity capital in the future.

Based on the number of shares of common stock outstanding as of April 30, 2018, upon completion of this offering, _____ shares of common stock will be outstanding, assuming no exercise by the underwriters of their option to purchase additional shares and no exercise of options. All of the shares sold in this offering will be freely tradable. The remaining shares of common stock outstanding after this offering will be restricted as a result of securities laws or lock-up agreements as described below. Following the expiration of the lock-up period, all shares will be eligible for resale in compliance with Rule 144 or Rule 701 under the Securities Act. "Restricted securities" as defined under Rule 144 of the Securities Act were issued and sold by us in reliance on exemptions from the registration requirements of the Securities Act. These shares may be sold in the public market only if registered or qualified for an exemption from registration, such as under Rule 144 or Rule 701 under the Securities Act.

Rule 144

In general, a person who has beneficially owned restricted stock for at least six months would be entitled to sell their securities provided that (i) such person is not deemed to have been one of our affiliates at the time of, or at any time during the 90 days preceding, a sale and (ii) we are subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale. Persons who have beneficially owned restricted shares for at least six months but who are our affiliates at the time of, or any time during the 90 days preceding, a sale, would be subject to additional restrictions, by which such person would be entitled to sell within any three-month period only a number of securities that does not exceed the greater of either of the following:

- 1% of the number of shares then outstanding, which will equal approximately _____ shares immediately after this offering assuming no exercise of the underwriters' option to purchase additional shares, based on the number of shares outstanding as of March 31, 2018; or
- the average weekly trading volume of our common stock on The NASDAQ Global Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to the sale;

provided, in each case, that we have been subject to the Exchange Act periodic reporting requirements for at least 90 days before the sale. Such sales both by affiliates and by non-affiliates must also comply with the manner of sale, current public information and notice provisions of Rule 144.

Rule 701

Rule 701 under the Securities Act, or Rule 701, as in effect on the date of this prospectus, permits resales of shares in reliance upon Rule 144 but without compliance with certain restrictions of Rule 144, including the holding period requirement. Most of our employees, executive officers or directors who purchased shares under a written compensatory plan or contract may be entitled to rely on the resale provisions of Rule 701, but all holders of Rule 701 shares are required to wait until 90 days after the date of this prospectus before selling their shares. However, substantially all Rule 701 shares are subject to lock-up agreements as described below and under "Underwriting" included elsewhere in this prospectus and will become eligible for sale upon the expiration of the restrictions set forth in those agreements.

Lock-up Agreements

In connection with this offering, we, each of our directors and executive officers, and holders of approximately shares of our outstanding stock have agreed with the underwriters that for a period of 180 days following the date of this prospectus, subject to certain exceptions, we will not offer, sell, assign, transfer, pledge, contract to sell or otherwise dispose of or hedge any shares of our common stock or any securities convertible into or exchangeable for shares of our common stock. J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC may, in their sole discretion, at any time, release all or any portion of the shares from the restrictions in this agreement.

Directed Share Program

At our request, the underwriters have reserved up to % of the shares for sale at the initial public offering price to our directors, officers, employees, business associates and related persons through a directed share program. The number of shares available for sale to the general public will be reduced by the number of directed shares purchased by participants in the program. Except for certain of our officers, directors and employees who have entered into lock-up agreements, each person buying shares through the directed share program has agreed that, for a period of days from the date of this prospectus, he or she will not, without the prior written consent of J.P. Morgan Securities LLC, dispose of or hedge any shares purchased in the program or any securities convertible into or exchangeable or redeemable for our common stock with respect to shares purchased in the program. For certain officers, directors and employees purchasing shares through the directed share program, the lock-up agreements described above with respect to the underwriting agreement shall govern with respect to their purchases. Any directed shares not purchased will be offered by the underwriters to the general public on the same basis as all other shares offered. We have agreed to indemnify the underwriters against certain liabilities and expenses, including liabilities under the Securities Act, in connection with the sales of the directed shares.

Rule 10b5-1 Trading Plans

Following the completion of this offering, certain of our officers, directors and other employees may adopt written plans, known as Rule 10b5-1 trading plans, in which they will contract with a broker to buy or sell shares of our common stock on a periodic basis to diversify their assets and investments. Under these 10b5-1 trading plans, a broker may execute trades pursuant to parameters established by the officer or director when entering into the plan, without further direction from such officer or director. Such sales would not commence until the expiration of the applicable lock-up agreements entered into by such officer or director in connection with this offering.

Registration Rights

We are party to an investor rights agreement which provides that holders holding shares of our common stock, including shares issuable upon the conversion of our convertible preferred stock, have the right to demand that we file a registration statement or request that their shares of our common stock be covered by a registration statement that we are otherwise filing. See “Description of Capital Stock—Registration Rights” in this prospectus. Except for shares purchased by affiliates, registration of their shares under the Securities Act would result in these shares becoming freely tradable without restriction under the Securities Act immediately upon effectiveness of the registration, subject to the expiration of the lock-up period described above and under “Underwriting” in this prospectus, and to the extent such shares have been released from any repurchase option that we may hold.

Equity Incentive Plans

As soon as practicable after the completion of this offering, we intend to file a Form S-8 registration statement under the Securities Act to register shares of our common stock subject to options outstanding or reserved for issuance under our equity incentive plans. This registration statement will become effective immediately upon filing, and shares covered by this registration statement will thereupon be eligible for sale in the public markets, subject to Rule 144 limitations applicable to affiliates and any lock-up agreements. For a more complete discussion of our equity incentive plans, see “Executive Compensation—Compensation Plans.”

**MATERIAL U.S. FEDERAL INCOME TAX CONSIDERATIONS FOR
NON-U.S. HOLDERS**

The following discussion is a summary of the material U.S. federal income tax considerations applicable to non-U.S. holders (as defined below) with respect to their ownership and disposition of shares of our common stock issued pursuant to this offering. For purposes of this discussion, a non-U.S. holder means a beneficial owner of our common stock that is for U.S. federal income tax purposes:

- a non-resident alien individual;
- a foreign corporation or any other foreign organization taxable as a corporation for U.S. federal income tax purposes; or
- a foreign estate or trust, the income of which is not subject to U.S. federal income tax on a net income basis.

This discussion does not address the tax treatment of partnerships or other entities that are pass-through entities for U.S. federal income tax purposes or persons that hold their common stock through partnerships or other pass-through entities. A partner in a partnership or other pass-through entity that will hold our common stock should consult his, her or its tax advisor regarding the tax consequences of acquiring, holding and disposing of our common stock through a partnership or other pass-through entity, as applicable.

This discussion is based on current provisions of the U.S. Internal Revenue Code of 1986, as amended, which we refer to as the Code, existing and proposed U.S. Treasury Regulations promulgated thereunder, current administrative rulings and judicial decisions, all as in effect as of the date of this prospectus and, all of which are subject to change or to differing interpretation, possibly with retroactive effect. Any such change or differing interpretation could alter the tax consequences to non-U.S. holders described in this prospectus. There can be no assurance that the Internal Revenue Service, which we refer to as the IRS, will not challenge one or more of the tax consequences described herein. We assume in this discussion that a non-U.S. holder holds shares of our common stock as a capital asset within the meaning of Section 1221 of the Code, generally property held for investment.

This discussion does not address all aspects of U.S. federal income taxation that may be relevant to a particular non-U.S. holder in light of that non-U.S. holder's individual circumstances nor does it address any aspects of any U.S. federal tax other than the income tax, U.S. state, local or non-U.S. taxes, the alternative minimum tax, or the Medicare tax on net investment income. This discussion also does not consider any specific facts or circumstances that may apply to a non-U.S. holder and does not address the special tax rules applicable to particular non-U.S. holders, such as:

- insurance companies;
- tax-exempt or governmental organizations;
- financial institutions;
- brokers or dealers in securities;
- regulated investment companies;
- pension plans;
- "controlled foreign corporations," "passive foreign investment companies," and corporations that accumulate earnings to avoid U.S. federal income tax;
- partnerships or other entities or arrangements treated as partnerships for U.S. federal income tax purposes (and partners and investors therein);
- persons deemed to sell our common stock under the constructive sale provisions of the Code;

[Table of Contents](#)

- persons that hold our common stock as part of a straddle, hedge, conversion transaction, synthetic security or other integrated investment;
- persons who hold or receive our common stock pursuant to the exercise of any employee stock option or otherwise as compensation; and
- certain U.S. expatriates.

This discussion is for general information only and is not tax advice. Accordingly, all prospective non-U.S. holders of our common stock should consult their tax advisors with respect to the U.S. federal, state, local and non-U.S. tax consequences of the purchase, ownership and disposition of our common stock.

Distributions on Our Common Stock

Distributions, if any, on our common stock will constitute dividends for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. If a distribution exceeds our current and accumulated earnings and profits, the excess will be treated as a tax-free return of the non-U.S. holder's investment, up to such holder's tax basis in the common stock. Any remaining excess will be treated as capital gain, subject to the tax treatment described below in "Gain on Sale or Other Taxable Disposition of Our Common Stock." Any such distributions will also be subject to the discussions below under the sections titled "Backup Withholding and Information Reporting" and "Withholding and Information Reporting Requirements—FATCA."

Subject to the discussion in the following two paragraphs in this section, dividends paid to a non-U.S. holder generally will be subject to withholding of U.S. federal income tax at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

Dividends that are treated as effectively connected with a trade or business conducted by a non-U.S. holder within the United States and, if an applicable income tax treaty so provides, that are attributable to a permanent establishment or a fixed base maintained by the non-U.S. holder within the United States, are generally exempt from the 30% withholding tax if the non-U.S. holder satisfies applicable certification and disclosure requirements. However, dividends that are treated as U.S. effectively connected income, net of specified deductions and credits, are taxed at the same graduated U.S. federal income tax rates applicable to United States persons (as defined in the Code). Any U.S. effectively connected income received by a non-U.S. holder that is a corporation may also, under certain circumstances, be subject to an additional "branch profits tax" at a 30% rate or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder's country of residence.

A non-U.S. holder of our common stock who claims the benefit of an applicable income tax treaty between the United States and such holder's country of residence generally will be required to provide a properly executed IRS Form W-8BEN or W-8BEN-E (or successor form) to the applicable withholding agent and satisfy applicable certification and other requirements. Non-U.S. holders are urged to consult their tax advisors regarding their entitlement to benefits under a relevant income tax treaty. A non-U.S. holder that is eligible for a reduced rate of U.S. withholding tax under an income tax treaty may obtain a refund or credit of any excess amounts withheld by timely filing a U.S. tax return with the IRS.

Gain on Sale or Other Taxable Disposition of Our Common Stock

Subject to the discussions below under "Backup Withholding and Information Reporting" and "Withholding and Information Reporting Requirements—FATCA," a non-U.S. holder generally will not be subject to any U.S. federal income tax on any gain realized upon such holder's sale or other taxable disposition of shares of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a U.S. trade or business and, if an applicable income tax treaty so provides, is attributable to a permanent establishment or a fixed-base

maintained by such non-U.S. holder in the United States, in which case the non-U.S. holder generally will be taxed on a net income basis at the graduated U.S. federal income tax rates applicable to United States persons (as defined in the Code) and, if the non-U.S. holder is a foreign corporation, the branch profits tax described above in “Distributions on Our Common Stock” also may apply;

- the non-U.S. holder is a nonresident alien individual who is present in the United States for 183 days or more in the taxable year of the disposition and certain other conditions are met, in which case the non-U.S. holder will be subject to a 30% tax (or such lower rate as may be specified by an applicable income tax treaty between the United States and such holder’s country of residence) on the net gain derived from the disposition, which may be offset by certain U.S. source capital losses of the non-U.S. holder, if any (even though the individual is not considered a resident of the United States), provided that the non-U.S. holder has timely filed U.S. federal income tax returns with respect to such losses; or
- we are, or have been, at any time during the five-year period preceding such sale of other taxable disposition (or the non-U.S. holder’s holding period, if shorter) a “U.S. real property holding corporation,” unless our common stock is regularly traded on an established securities market and the non-U.S. holder holds no more than 5% of our outstanding common stock, directly or indirectly, actually or constructively, during the shorter of the 5-year period ending on the date of the disposition or the period that the non-U.S. holder held our common stock. Generally, a corporation is a U.S. real property holding corporation only if the fair market value of its U.S. real property interests equals or exceeds 50% of the sum of the fair market value of its worldwide real property interests plus its other assets used or held for use in a trade or business. Although there can be no assurance, we do not believe that we are, or have been, a U.S. real property holding corporation, or that we are likely to become one in the future. No assurance can be provided that our common stock will be regularly traded on an established securities market for purposes of the rules described above.

Backup Withholding and Information Reporting

We must report annually to the IRS and to each non-U.S. holder the gross amount of the distributions on our common stock paid to such holder and the tax withheld, if any, with respect to such distributions. Non-U.S. holders may have to comply with specific certification procedures to establish that the holder is not a United States person (as defined in the Code) in order to avoid backup withholding at the applicable rate with respect to dividends on our common stock. Dividends paid to non-U.S. holders subject to withholding of U.S. federal income tax, as described above in “Distributions on Our Common Stock,” generally will be exempt from U.S. backup withholding.

Information reporting and backup withholding will generally apply to the proceeds of a disposition of our common stock by a non-U.S. holder effected by or through the U.S. office of any broker, U.S. or foreign, unless the holder certifies its status as a non-U.S. holder and satisfies certain other requirements, or otherwise establishes an exemption. Generally, information reporting and backup withholding will not apply to a payment of disposition proceeds to a non-U.S. holder where the transaction is effected outside the United States through a non-U.S. office of a broker. However, for information reporting purposes, dispositions effected through a non-U.S. office of a broker with substantial U.S. ownership or operations generally will be treated in a manner similar to dispositions effected through a U.S. office of a broker. Non-U.S. holders should consult their tax advisors regarding the application of the information reporting and backup withholding rules to them. Copies of information returns may be made available to the tax authorities of the country in which the non-U.S. holder resides or is incorporated under the provisions of a specific treaty or agreement. Backup withholding is not an additional tax. Any amounts withheld under the backup withholding rules from a payment to a non-U.S. holder can be refunded or credited against the non-U.S. holder’s U.S. federal income tax liability, if any, provided that an appropriate claim is filed with the IRS in a timely manner.

Withholding and Information Reporting Requirements—FATCA

The Foreign Account Tax Compliance Act, or FATCA, generally imposes a U.S. federal withholding tax at a rate of 30% on payments of dividends on, or gross proceeds from the sale or other disposition of, our common stock paid to a foreign entity unless (i) if the foreign entity is a “foreign financial institution,” such foreign entity undertakes certain due diligence, reporting, withholding, and certification obligations, (ii) if the foreign entity is not a “foreign financial institution,” such foreign entity identifies certain of its U.S. investors, if any, or (iii) the foreign entity is otherwise exempt under FATCA. Under applicable U.S. Treasury regulations, withholding under FATCA currently applies to payments of dividends on our common stock, but will only apply to payments of gross proceeds from a sale or other disposition of our common stock made after December 31, 2018. Under certain circumstances, a non-U.S. holder may be eligible for refunds or credits of this withholding tax. An intergovernmental agreement between the United States and an applicable foreign country may modify the requirements described in this paragraph. Non-U.S. holders should consult their tax advisors regarding the possible implications of this legislation on their investment in our common stock and the entities through which they hold our common stock, including, without limitation, the process and deadlines for meeting the applicable requirements to prevent the imposition of the 30% withholding tax under FATCA.

UNDERWRITING

We are offering the shares of common stock described in this prospectus through a number of underwriters. J.P. Morgan Securities LLC, Goldman Sachs & Co. LLC and Cowen and Company, LLC are acting as joint book-running managers of the offering and as representatives of the underwriters. We have entered into an underwriting agreement with the representatives. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to the underwriters, and each underwriter has severally agreed to purchase, at the initial public offering price less the underwriting discounts and commissions set forth on the cover page of this prospectus, the number of shares of common stock listed next to its name in the following table:

Name	Number of Shares
J.P. Morgan Securities LLC	
Goldman Sachs & Co. LLC	
Cowen and Company, LLC	
Wedbush Securities Inc.	
Total	

The underwriters are committed to purchase all the common shares offered by us if they purchase any shares. The underwriting agreement also provides that if an underwriter defaults, the purchase commitments of non-defaulting underwriters may also be increased or the offering may be terminated.

The underwriters propose to offer the common shares directly to the public at the initial public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of \$ _____ per share. Any such dealers may resell shares to certain other brokers or dealers at a discount of up to \$ _____ per share from the initial public offering price. After the initial offering of the shares to the public, if all of the common shares are not sold at the initial public offering price, the underwriters may change the offering price and the other selling terms. Sales of shares made outside of the United States may be made by affiliates of the underwriters. The offering of the shares by the underwriters is subject to receipt and acceptance and subject to the underwriters' right to reject any order in whole or in part.

The underwriters have an option to buy up to _____ additional shares of common stock from us to cover sales of shares by the underwriters which exceed the number of shares specified in the table above. The underwriters have 30 days from the date of this prospectus to exercise this option to purchase additional shares. If any shares are purchased with this option to purchase additional shares, the underwriters will purchase shares in approximately the same proportion as shown in the table above. If any additional shares of common stock are purchased, the underwriters will offer the additional shares on the same terms as those on which the shares are being offered.

The underwriting fee is equal to the public offering price per share of common stock less the amount paid by the underwriters to us per share of common stock. The underwriting fee is \$ _____ per share. The following table shows the per share and total underwriting discounts and commissions to be paid to the underwriters assuming both no exercise and full exercise of the underwriters' option to purchase additional shares.

	Without option to purchase additional shares exercise	With full option to purchase additional shares exercise
Per share	\$ _____	\$ _____
Total	\$ _____	\$ _____

[Table of Contents](#)

We estimate that the total expenses of this offering, including registration, filing and listing fees, printing fees and legal and accounting expenses, but excluding the underwriting discounts and commissions, will be approximately \$. We have agreed to reimburse the underwriters for expenses of up to \$ related to clearance of this offering with FINRA.

A prospectus in electronic format may be made available on the web sites maintained by one or more underwriters, or selling group members, if any, participating in this offering. The underwriters may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the representatives to underwriters and selling group members that may make Internet distributions on the same basis as other allocations.

We have agreed that for a period of 180 days after the date of this prospectus, we will not (i) offer, pledge, announce the intention to sell, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase or otherwise dispose of, directly or indirectly, or file with the Securities and Exchange Commission a registration statement under the Securities Act relating to, any shares of our common stock or securities convertible into or exchangeable or exercisable for any shares of our common stock, or publicly disclose the intention to make any offer, sale, pledge, disposition or filing (other than filings on Form S-8 relating to our existing management incentive plans, or (ii) enter into any swap or other arrangement that transfers all or a portion of the economic consequences associated with the ownership of any shares of common stock or any such other securities (regardless of whether any of these transactions are to be settled by the delivery of shares of common stock or such other securities, in cash or otherwise), in each case, without the prior written consent of J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, other than (a) the shares of our common stock to be sold hereunder; (b) any shares of our common stock issued upon the exercise of options granted under our existing management incentive plans, (c) the grant of awards under our existing management incentive plans as disclosed in this prospectus, (d) up to 5% of our outstanding securities issued in connection with mergers, acquisitions or commercial or strategic transactions, or (e) the filing of any registration statement on Form S-8 relating to our existing management incentive plans described in this prospectus; provided that, in the case of any transfer or distribution pursuant to clauses (b) through (d), each transferee shall execute and deliver to J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC a lock-up agreement.

Our directors and executive officers, and certain of our significant shareholders have entered into lock-up agreements with the underwriters prior to the commencement of this offering pursuant to which each of these persons or entities, with limited exceptions, for a period of 180 days after the date of this prospectus, or the restricted period, may not, without the prior written consent of J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC, (1) offer, pledge, announce the intention to sell, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any option, right or warrant to purchase, or otherwise transfer or dispose of, directly or indirectly, any shares of our common stock or any securities convertible into or exercisable or exchangeable for our common stock (including, without limitation, common stock or such other securities which may be deemed to be beneficially owned by such directors, executive officers, managers and members in accordance with the rules and regulations of the SEC and securities which may be issued upon exercise of a stock option or warrant) or (2) enter into any swap or other agreement that transfers, in whole or in part, any of the economic consequences of ownership of the common stock or such other securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of common stock or such other securities, in cash or otherwise, or (3) make any demand for or exercise any right with respect to the registration of any shares of our common stock or any security convertible into or exercisable or exchangeable for our common stock, in each case, subject to certain exceptions, including:

- (A) any shares of our common stock sold by such director, executive officer or significant shareholder in this offering;
- (B) transfers of shares of common stock as a bona fide gift or gifts;

Table of Contents

- (C) transfers of shares of common stock or other securities to a trust or limited family partnership for the direct or indirect benefit of the transferor or the immediate family of the transferor in a transaction not involving a disposition for value;
- (D) transfers of shares of common stock or other securities by will, other testamentary document or intestate succession in a transaction not involving a disposition for value;
- (E) transfers of shares of common stock or other securities pursuant to a court order in respect of, or by operation of law as a result of, a divorce, in a transaction not involving a disposition for value;
- (F) the exercise, including by and to the extent necessary to cover any “net” exercise, of any options or warrants to acquire shares of common stock expiring during the restricted period referred to above or the conversion of any convertible security into shares of common stock in accordance with its terms;
- (G) transfers of shares of common stock or other securities to a limited liability company or partnership wholly-owned and controlled by the transferor in a transaction not involving a disposition for value;
- (H) if such entity is a trust, transfers of shares of common stock or other securities to any beneficiary of such trust or the estate of any such beneficiary in a transaction not involving a disposition for value;
- (I) transfers or distributions of shares of common stock to members, limited partners, stockholders or affiliates of, or any investment fund or other entity that controls or manages the transferor in a transaction not involving a disposition for value; and
- (J) transactions relating to shares of common stock or other securities purchased in this offering or in open market transactions during the restricted period;

provided that in the case of any transfer or distribution pursuant to clauses (B) through (E) and (G) through (I) each donee, distributee or transferee shall execute and deliver to J.P. Morgan Securities LLC and Goldman Sachs & Co. LLC a lock-up agreement; and provided, further, that in the case of any transfer or distribution pursuant to clause (B) through (E) and (G) through (J), no filing by any party (donor, donee, transferor or transferee) under the Exchange Act or other public announcement shall be required or shall be made voluntarily in connection with such transfer or distribution (other than a filing on a Form 5 made after the expiration of the restricted period and any required Schedule 13G (or 13G/A)).

The lock-up agreements will not apply to the establishment of a written trading plan by any director, executive officer or stockholder pursuant to Rule 10b5-1 under the Exchange Act for the sale of shares of common stock, provided that such plan does not provide for the sale of common stock during the restricted period referred to above and no public announcement or filing under the Exchange Act, if any, is required of or is voluntarily made by or on behalf of such director, executive officer or stockholder or us regarding such plan.

We have agreed to indemnify the several underwriters against certain liabilities, including liabilities under the Securities Act.

We have applied to list our common stock on The NASDAQ Global Market under the symbol “MGTA”.

In connection with this offering, the underwriters may engage in stabilizing transactions, which involves making bids for, purchasing and selling shares of common stock in the open market for the purpose of preventing or retarding a decline in the market price of the common stock while this offering is in progress. These stabilizing transactions may include making short sales of the common stock, which involves the sale by the underwriters of a greater number of shares of common stock than they are required to purchase in this offering, and purchasing shares of common stock on the open market to cover positions created by short sales. Short sales may be “covered” shorts, which are short positions in an amount not greater than the underwriters’ option to purchase additional shares referred to above, or may be “naked” shorts, which are short positions in excess of that amount. The underwriters may close out any covered short position either by exercising their option to purchase

[Table of Contents](#)

additional shares, in whole or in part, or by purchasing shares in the open market. In making this determination, the underwriters will consider, among other things, the price of shares available for purchase in the open market compared to the price at which the underwriters may purchase shares through the option to purchase additional shares. A naked short position is more likely to be created if the underwriters are concerned that there may be downward pressure on the price of the common stock in the open market that could adversely affect investors who purchase in this offering. To the extent that the underwriters create a naked short position, they will purchase shares in the open market to cover the position.

The underwriters have advised us that, pursuant to Regulation M of the Securities Act of 1933, they may also engage in other activities that stabilize, maintain or otherwise affect the price of the common stock, including the imposition of penalty bids. This means that if the representatives of the underwriters purchase common stock in the open market in stabilizing transactions or to cover short sales, the representatives can require the underwriters that sold those shares as part of this offering to repay the underwriting discount received by them.

These activities may have the effect of raising or maintaining the market price of the common stock or preventing or retarding a decline in the market price of the common stock, and, as a result, the price of the common stock may be higher than the price that otherwise might exist in the open market. If the underwriters commence these activities, they may discontinue them at any time. The underwriters may carry out these transactions on The NASDAQ Global Market, in the over-the-counter market or otherwise.

Prior to this offering, there has been no public market for our common stock. The initial public offering price will be determined by negotiations between us and the representatives of the underwriters. In determining the initial public offering price, we and the representatives of the underwriters expect to consider a number of factors, including:

- the information set forth in this prospectus and otherwise available to the representatives;
- our prospects and the history and prospects for the industry in which we compete;
- an assessment of our management;
- our prospects for future earnings;
- the general condition of the securities markets at the time of this offering;
- the recent market prices of, and demand for, publicly traded common stock of generally comparable companies; and
- other factors deemed relevant by the underwriters and us.

Neither we nor the underwriters can assure investors that an active trading market will develop for our common shares, or that the shares will trade in the public market at or above the initial public offering price.

Directed Share Program

At our request, the underwriters have reserved % of the shares of common stock to be issued by the Company and offered by this prospectus for sale, at the initial public offering price, to our directors, officers, employees, business associates and related persons. If purchased by these persons, these shares will be subject to a -day lock-up restriction. The number of shares of common stock available for sale to the general public will be reduced to the extent these individuals purchase such reserved shares. Any reserved shares that are not so purchased will be offered by the underwriters to the general public on the same basis as the other shares offered by this prospectus.

Other relationships

The underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include sales and trading, commercial and investment banking, advisory, investment management,

investment research, principal investment, hedging, market making, brokerage and other financial and non-financial activities and services. Certain of the underwriters and their affiliates have provided in the past to us and our affiliates, and may provide from time to time in the future, certain commercial banking, financial advisory or investment banking advice or other services in the ordinary course of their business, for which they have received and may continue to receive customary fees and commissions. In addition, from time to time, certain of the underwriters and their respective affiliates, officers, directors and employees may effect transactions for their own account or the account of customers, and hold on behalf of themselves or their customers, long or short positions in our debt or equity securities or loans, and may do so in the future. The underwriters and their respective affiliates may also communicate independent investment recommendations, market color or trading ideas and/or publish or express independent research views in respect of the company's securities and may at any time hold, or recommend to clients that they should acquire, long and/or short positions in the company's securities.

Selling restrictions

General

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Canada

The shares may be sold only to purchasers purchasing, or deemed to be purchasing, as principal that are accredited investors, as defined in National Instrument 45-106 *Prospectus Exemptions* or subsection 73.3(1) of the *Securities Act* (Ontario), and are permitted clients, as defined in National Instrument 31-103 *Registration Requirements, Exemptions and Ongoing Registrant Obligations*. Any resale of the shares must be made in accordance with an exemption from, or in a transaction not subject to, the prospectus requirements of applicable securities laws.

Securities legislation in certain provinces or territories of Canada may provide a purchaser with remedies for rescission or damages if this prospectus (including any amendment thereto) contains a misrepresentation, provided that the remedies for rescission or damages are exercised by the purchaser within the time limit prescribed by the securities legislation of the purchaser's province or territory. The purchaser should refer to any applicable provisions of the securities legislation of the purchaser's province or territory for particulars of these rights or consult with a legal advisor.

Pursuant to section 3A.3 of National Instrument 33-105 *Underwriting Conflicts* (NI 33-105), the representatives are not required to comply with the disclosure requirements of NI 33-105 regarding underwriter conflicts of interest in connection with this offering.

European Economic Area

In relation to each Member State of the European Economic Area that has implemented the Prospectus Directive (each, a "Relevant Member State"), an offer to the public of our common shares may not be made in that

[Table of Contents](#)

Relevant Member State, except that an offer to the public in that Relevant Member State of our common shares may be made at any time under the following exemptions under the Prospectus Directive:

- (a) to any legal entity that is a qualified investor as defined in the Prospectus Directive;
- (b) to fewer than 150 natural or legal persons (other than qualified investors as defined in the Prospectus Directive), subject to obtaining the prior consent of the Representatives for any such offer; or
- (c) in any other circumstances falling within Article 3(2) of the Prospectus Directive,

provided that no such offer of shares of our common stock shall result in a requirement for the publication by us or any underwriter of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an “offer to the public” in relation to our common shares in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and our common shares to be offered so as to enable an investor to decide to purchase our common shares, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State; and the expression “Prospectus Directive” means Directive 2003/71/EC (as amended), including by Directive 2010/73/EU, and includes any relevant implementing measure in the Relevant Member State.

Hong Kong

The shares may not be offered or sold by means of any document other than (i) in circumstances that do not constitute an offer to the public within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), or (ii) to “professional investors” within the meaning of the Securities and Futures Ordinance (Cap.571, Laws of Hong Kong) and any rules made thereunder, or (iii) in other circumstances that do not result in the document being a “prospectus” within the meaning of the Companies Ordinance (Cap.32, Laws of Hong Kong), and no advertisement, invitation or document relating to the shares may be issued or may be in the possession of any person for the purpose of issue (in each case whether in Hong Kong or elsewhere), which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the laws of Hong Kong) other than with respect to shares that are or are intended to be disposed of only to persons outside Hong Kong or only to “professional investors” within the meaning of the Securities and Futures Ordinance (Cap. 571, Laws of Hong Kong) and any rules made thereunder.

Japan

The securities have not been and will not be registered under the Financial Instruments and Exchange Law of Japan, or the Financial Instruments and Exchange Law, and each underwriter has agreed that it will not offer or sell any securities, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan (which term, as used in this prospectus means any person resident in Japan, including any corporation or other entity organized under the laws of Japan) or to others for re-offering or resale, directly or indirectly, in Japan or to a resident of Japan, except pursuant to an exemption from the registration requirements of, and otherwise in compliance with, the Financial Instruments and Exchange Law and any other applicable laws, regulations and ministerial guidelines of Japan.

Singapore

This prospectus has not been registered as a prospectus with the Monetary Authority of Singapore. Accordingly, this prospectus and any other document or material in connection with the offer or sale, or invitation for subscription or purchase, of the shares may not be circulated or distributed, nor may the shares be offered or sold, or be made the subject of an invitation for subscription or purchase, whether directly or indirectly, to persons in

[Table of Contents](#)

Singapore other than (i) to an institutional investor under Section 274 of the Securities and Futures Act, Chapter 289 of Singapore, or the SFA, (ii) to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA or (iii) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA.

Where the shares are subscribed or purchased under Section 275 by a relevant person that is: (a) a corporation (which is not an accredited investor) the sole business of which is to hold investments and the entire share capital of which is owned by one or more individuals, each of whom is an accredited investor; or (b) a trust (where the trustee is not an accredited investor) whose sole purpose is to hold investments and each beneficiary is an accredited investor, shares, debentures and units of shares and debentures of that corporation or the beneficiaries' rights and interest in that trust shall not be transferable for six months after that corporation or that trust has acquired the shares under Section 275 except: (1) to an institutional investor under Section 274 of the SFA or to a relevant person, or any person pursuant to Section 275(1A), and in accordance with the conditions, specified in Section 275 of the SFA; (2) where no consideration is given for the transfer; or (3) by operation of law.

Switzerland

The shares may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange, or SIX, or on any other stock exchange or regulated trading facility in Switzerland. This document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document, nor any other offering or marketing material relating to the shares or this offering, may be publicly distributed or otherwise made publicly available in Switzerland. Neither this document nor any other offering or marketing material relating to this offering, the Company, the shares has been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of shares will not be supervised by, the Swiss Financial Market Supervisory Authority FINMA, or FINMA, and the offer of shares has not been and will not be authorized under the Swiss Federal Act on Collective Investment Schemes, or CISA. The investor protection afforded to acquirers of interests in collective investment schemes under the CISA does not extend to acquirers of shares.

United Arab Emirates

This prospectus relates to an Exempt Offer in accordance with the Offered Securities Rules of the Dubai Financial Services Authority, or DFSA. This prospectus is intended for distribution only to persons of a type specified in the Offered Securities Rules of the DFSA. It must not be delivered to, or relied on by, any other person. The DFSA has no responsibility for reviewing or verifying any documents in connection with Exempt Offers. The DFSA has not approved this prospectus nor taken steps to verify the information set forth herein and has no responsibility for this prospectus. The shares to which this prospectus relates may be illiquid and/or subject to restrictions on their resale. Prospective purchasers of the shares offered should conduct their own due diligence on the shares. If you do not understand the contents of this prospectus, you should consult an authorized financial advisor.

United Kingdom

This document is only being distributed to and is only directed at (i) persons who are outside the United Kingdom or (ii) to investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005, or the Order, or (iii) high net worth entities, and other persons to whom it may lawfully be communicated, falling with Article 49(2)(a) to (d) of the Order (all such persons together being referred to as "relevant persons"). The securities are only available to, and any invitation, offer or agreement to subscribe, purchase or otherwise acquire such securities will be engaged in only with, relevant persons. Any person who is not a relevant person should not act or rely on this document or any of its contents.

LEGAL MATTERS

The validity of the common stock offered hereby will be passed upon for us by Goodwin Procter LLP, Boston, Massachusetts and for the underwriters by Davis Polk & Wardwell LLP, New York, New York.

EXPERTS

The financial statements of Magenta Therapeutics, Inc. as of December 31, 2016 and 2017 and for each of the years then ended are included herein in reliance upon the report of KPMG LLP, independent registered public accounting firm, appearing elsewhere herein, and upon the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND MORE INFORMATION

We have filed with the SEC a registration statement on Form S-1 under the Securities Act that registers the shares of our common stock to be sold in this offering. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules filed as part of the registration statement. For further information with respect to us and our common stock, we refer you to the registration statement and the exhibits and schedules filed as a part of the registration statement. Statements contained in this prospectus concerning the contents of any contract or any other document are not necessarily complete. If a contract or document has been filed as an exhibit to the registration statement, we refer you to the copy of the contract or document that has been filed. Each statement in this prospectus relating to a contract or document filed as an exhibit is qualified in all respects by the filed exhibit. The reports and other information we file with the SEC can be read and copied at the SEC's Public Reference Room at 100 F Street, NE, Washington D.C. 20549. Copies of these materials can be obtained at prescribed rates from the Public Reference Section of the SEC at the principal offices of the SEC, 100 F Street, NE, Washington D.C. 20549. You may obtain information regarding the operation of the public reference room by calling 1(800) SEC-0330. The SEC also maintains a web site (<http://www.sec.gov>) that contains reports, proxy and information statements and other information regarding issuers like us that file electronically with the SEC.

Upon completion of this offering, we will become subject to the reporting and information requirements of the Exchange Act and, as a result, will file periodic reports, proxy statements and other information with the SEC. These periodic reports, proxy statements and other information will be available for inspection and copying at the SEC's public reference room and the web site of the SEC referred to above.

INDEX TO FINANCIAL STATEMENTS

	<u>Page</u>
Years Ended December 31, 2016 and 2017	
Report of Independent Registered Public Accounting Firm	F-2
Balance Sheets	F-3
Statements of Operations and Comprehensive Loss	F-4
Statements of Redeemable Convertible Preferred Stock and Stockholders' Deficit	F-5
Statements of Cash Flows	F-6
Notes to Financial Statements	F-7
Interim Financial Statements (Unaudited)	
Balance Sheets	F-27
Statements of Operations and Comprehensive Loss	F-28
Statements of Cash Flows	F-29
Notes to Unaudited Interim Financial Statements	F-30

Report of Independent Registered Public Accounting Firm

To the Stockholders and Board of Directors
Magenta Therapeutics, Inc.:

Opinion on the Financial Statements

We have audited the accompanying balance sheets of Magenta Therapeutics, Inc. (the Company) as of December 31, 2016 and 2017, the related statements of operations and comprehensive loss, redeemable convertible preferred stock and stockholders' deficit, and cash flows for each of the years then ended and the related notes (collectively, the financial statements). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2016 and 2017, and the results of its operations and its cash flows for each of the years then ended, in conformity with U.S. generally accepted accounting principles.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB and in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audit included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

/s/ KPMG LLP

We have served as the Company's auditor since 2017.

Cambridge, Massachusetts

March 28, 2018, except as to notes 1 and 15, which date is May 7, 2018

MAGENTA THERAPEUTICS, INC.

BALANCE SHEETS

(In thousands, except share and per share amounts)

	<u>December 31,</u>	
	<u>2016</u>	<u>2017</u>
Assets		
Current assets:		
Cash and cash equivalents	\$ 4,513	\$ 51,402
Restricted cash	30	165
Other receivables	6,250	—
Prepaid expenses and other current assets	41	936
Total current assets	<u>10,834</u>	<u>52,503</u>
Property and equipment, net	508	1,956
Other assets	—	4
Total assets	<u>\$11,342</u>	<u>\$ 54,463</u>
Liabilities, Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit)		
Current liabilities:		
Accounts payable	\$ 1,667	\$ 167
Accrued expenses	633	3,975
Total current liabilities	<u>2,300</u>	<u>4,142</u>
Commitments and contingencies (Note 11)		
Redeemable convertible preferred stock (Series A and B), \$0.001 par value; 48,700,000 and 49,178,527 shares authorized as of December 31, 2016 and 2017, respectively; 17,718,974 and 49,178,527 shares issued and outstanding as of December 31, 2016 and 2017, respectively; aggregate liquidation preference of \$88,164 as of December 31, 2017	<u>17,916</u>	<u>92,439</u>
Stockholders' Equity (Deficit):		
Common stock, \$0.001 par value; 70,000,000 shares authorized as of December 31, 2016 and 2017; 12,795,853 and 11,520,853 shares issued and 3,483,529 and 6,075,577 shares outstanding as of December 31, 2016 and 2017, respectively	3	6
Additional paid-in capital	843	3,087
Accumulated deficit	<u>(9,720)</u>	<u>(45,211)</u>
Total stockholders' equity (deficit)	<u>(8,874)</u>	<u>(42,118)</u>
Total liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)	<u>\$11,342</u>	<u>\$ 54,463</u>

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

(In thousands, except share and per share amounts)

	Year Ended December 31,	
	2016	2017
Revenue	\$ —	\$ —
Operating expenses:		
Research and development	5,782	27,899
General and administrative	3,486	7,828
Total operating expenses	9,268	35,727
Loss from operations	(9,268)	(35,727)
Other income (expense):		
Interest expense	(163)	—
Interest and other income, net	—	236
Total other income (expense), net	(163)	236
Net loss and comprehensive loss	(9,431)	(35,491)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634
Net loss attributable to common stockholders	\$ (9,735)	\$ (35,507)
Net loss per share attributable to common stockholders—basic and diluted	\$ (25.21)	\$ (7.40)
Weighted average common shares outstanding—basic and diluted	386,083	4,798,213
Pro forma net loss per share attributable to common stockholders—basic and diluted (unaudited)		\$ (0.80)
Pro forma weighted average common shares outstanding—basic and diluted (unaudited)		44,294,374

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF REDEEMABLE CONVERTIBLE PREFERRED STOCK AND STOCKHOLDERS' DEFICIT

(In thousands, except share amounts)

	Series A and B Redeemable Convertible Preferred Stock		Common Stock		Additional Paid-in Capital	Accumulated Deficit	Total Stockholders' Deficit
	Shares	Amount	Shares	Amount			
Balances at December 31, 2015	—	\$ —	—	\$ —	\$ —	\$ (289)	\$ (289)
Issuance of Series A redeemable convertible preferred stock, net of issuance costs of \$107	10,554,990	10,448	—	—	—	—	—
Conversion of notes payable and accrued interest into Series A redeemable convertible preferred stock	7,163,984	7,164	—	—	—	—	—
Vesting of restricted stock	—	—	1,998,529	2	11	—	13
Issuance of common stock in connection with payment of consultant fees	—	—	490,000	—	157	—	157
Issuance of common stock in connection with a license agreement	—	—	995,000	1	317	—	318
Accretion of Series A redeemable convertible preferred stock to redemption value	—	107	—	—	(107)	—	(107)
Cumulative dividends on redeemable convertible preferred stock	—	197	—	—	(197)	—	(197)
Stock-based compensation expense	—	—	—	—	662	—	662
Net loss	—	—	—	—	—	(9,431)	(9,431)
Balances at December 31, 2016	17,718,974	17,916	3,483,529	3	843	(9,720)	(8,874)
Issuance of Series A redeemable convertible preferred stock	15,445,000	15,445	—	—	—	—	—
Issuance of Series B redeemable convertible preferred stock, net of issuance costs of \$213	12,871,003	49,787	—	—	—	—	—
Issuance of Series A and B redeemable convertible preferred stock in connection with a license agreement	3,143,550	9,275	—	—	—	—	—
Vesting of restricted stock	—	—	2,582,048	3	1	—	4
Issuance of common stock in connection with payment of consultant fees	—	—	10,000	—	—	—	—
Accretion of Series B redeemable convertible preferred stock to redemption value	—	213	—	—	(213)	—	(213)
Cumulative dividends on Series A redeemable convertible preferred stock	—	437	—	—	(437)	—	(437)
Reversal of Series A redeemable convertible preferred stock dividend	—	(634)	—	—	634	—	634
Stock-based compensation expense	—	—	—	—	2,259	—	2,259
Net loss	—	—	—	—	—	(35,491)	(35,491)
Balances at December 31, 2017	49,178,527	\$92,439	6,075,577	\$ 6	\$ 3,087	\$ (45,211)	\$ (42,118)

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF CASH FLOWS

(In thousands)

	Year ended December 31,	
	2016	2017
Cash flows from operating activities:		
Net loss	\$ (9,431)	\$(35,491)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation expense	662	2,259
Depreciation and amortization expense	6	376
Non-cash interest expense	163	—
License fees paid in common stock	318	—
License fees paid in preferred stock	—	9,275
Consultant fees paid in common stock	157	—
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(41)	(895)
Accounts payable	1,006	(1,125)
Accrued expenses	631	3,342
Other assets	—	(4)
Net cash used in operating activities	<u>(6,529)</u>	<u>(22,263)</u>
Cash flows from investing activities:		
Purchases of property and equipment	(139)	(2,199)
Change in restricted cash	(30)	(135)
Net cash used in investing activities	<u>(169)</u>	<u>(2,334)</u>
Cash flows from financing activities:		
Proceeds from issuance of redeemable convertible preferred stock	4,305	71,695
Proceeds from issuance of convertible notes payable	6,500	—
Payments of redeemable convertible preferred stock issuance costs	(107)	(213)
Proceeds from issuance of common and restricted stock	13	4
Net cash provided by financing activities	<u>10,711</u>	<u>71,486</u>
Net increase in cash and cash equivalents	4,013	46,889
Cash and cash equivalents at beginning of period	500	4,513
Cash and cash equivalents at end of period	<u>\$ 4,513</u>	<u>\$ 51,402</u>
Supplemental disclosure of non-cash investing and financing activities:		
Purchases of property and equipment included in accounts payable and accrued expenses	\$ 375	\$ —
Conversion of notes payable and accrued interest into redeemable convertible preferred stock	\$ 7,164	\$ —
Other receivable from investor for redeemable convertible preferred stock	\$ 6,250	\$ —
Accretion of redeemable convertible preferred stock to redemption values	\$ 107	\$ 213
Cumulative dividends on Series A redeemable convertible preferred stock	\$ 197	\$ 437
Reversal of cumulative dividends on Series A redeemable convertible preferred stock	\$ —	\$ (634)

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

NOTES TO FINANCIAL STATEMENTS

1. Nature of the Business and Basis of Presentation

Magenta Therapeutics, Inc. (the “Company”) is a clinical-stage biopharmaceutical company developing novel medicines to bring the curative power of bone marrow transplant to more patients. The Company was incorporated under the laws of the State of Delaware in June 2015 as HSCTCo Therapeutics, Inc. In February 2016, the Company changed its name to Magenta Therapeutics, Inc.

The Company is subject to risks and uncertainties common to early-stage companies in the biotechnology industry, including, but not limited to, development by competitors of new technological innovations, dependence on key personnel, protection of proprietary technology, compliance with government regulations and the ability to secure additional capital to fund operations. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel and infrastructure and extensive compliance-reporting capabilities. Even if the Company’s drug development efforts are successful, it is uncertain when, if ever, the Company will realize significant revenue from product sales.

Going Concern

In accordance with Accounting Standards Update (“ASU”) 2014-15, *Disclosure of Uncertainties about an Entity’s Ability to Continue as a Going Concern (Subtopic 205-40)*, the Company has evaluated whether there are conditions and events, considered in the aggregate, that raise substantial doubt about the Company’s ability to continue as a going concern within one year after the date that the financial statements are issued.

Since inception, the Company has funded its operations primarily with proceeds from the sales of redeemable convertible preferred stock and issuance of convertible notes. The Company has incurred recurring losses since inception, including net losses of \$9.4 million for the year ended December 31, 2016 and \$35.5 million for the year ended December 31, 2017. As of December 31, 2017, the Company had an accumulated deficit of \$45.2 million. The Company expects to continue to generate operating losses for the foreseeable future. In April 2018, the Company received gross proceeds of \$52.3 million from the sale of 11,223,102 shares of Series C redeemable convertible preferred stock (the “Series C Preferred Stock”) (see Note 15). As of May 7, 2018, the issuance date of the financial statements for the year ended December 31, 2017, the Company expects that the proceeds from the sale of Series C Preferred Stock in April 2018, together with its cash and cash equivalents of \$41.5 million as of March 31, 2018, will be sufficient to fund its operating expenses and capital expenditure requirements through 12 months from the date of issuance of those financial statements. The future viability of the Company beyond that point is dependent on its ability to raise additional capital to fund its operations.

The Company is seeking to complete an initial public offering (“IPO”) of its common stock. Upon the closing of a qualified public offering on specified terms, the Company’s outstanding redeemable convertible preferred stock will automatically convert into shares of common stock (see Note 7). In the event the Company does not complete an IPO, the Company expects to seek additional funding through private equity financings, debt financings, or other capital sources, including collaborations with other companies, or other strategic transactions. The Company may not be able to obtain funding on acceptable terms, or at all. The terms of any financing may adversely affect the holdings or the rights of the Company’s stockholders.

If the Company is unable to obtain funding, the Company could be forced to delay, reduce or eliminate some or all of its research and development programs, product portfolio expansion or commercialization efforts,

which could adversely affect its business prospects, or the Company may be unable to continue operations. Although management continues to pursue these plans, there is no assurance that the Company will be successful in obtaining sufficient funding on terms acceptable to the Company to fund continuing operations, if at all.

The financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”).

2. Summary of Significant Accounting Policies

Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, the disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of expenses during the reporting periods. Significant estimates and assumptions reflected in these financial statements include, but are not limited to, the accrual for research and development expenses and the valuation of common and preferred stock and stock-based awards. Estimates are periodically reviewed in light of changes in circumstances, facts and experience. Changes in estimates are recorded in the period in which they become known. Actual results could differ from those estimates.

Unaudited Pro Forma Information

In the accompanying statements of operations and comprehensive loss, the unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2017 has been prepared to give effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock as if the Company’s proposed initial public offering had occurred on the later of January 1, 2017 or the issuance date of the redeemable convertible preferred stock.

Concentrations of Credit Risk and of Significant Suppliers

Financial instruments that potentially expose the Company to concentrations of credit risk consist primarily of cash and cash equivalents. The Company maintains all cash and cash equivalents at one accredited financial institution. The Company does not believe that it is subject to unusual credit risk beyond the normal credit risk associated with commercial banking relationships.

The Company is dependent on third-party manufacturers to supply products for research and development activities in its programs. In particular, the Company relies and expects to continue to rely on a small number of manufacturers to supply it with its requirements for the active pharmaceutical ingredients and formulated drugs related to these programs. These programs could be adversely affected by a significant interruption in the supply of active pharmaceutical ingredients and formulated drugs.

Deferred Offering Costs

The Company capitalizes certain legal, professional accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated. After consummation of the equity financing, these costs are recorded in stockholders’ deficit as a reduction of additional paid-in capital generated as a result of the offering. Should the in-process equity financing be abandoned, the deferred offering costs will be expensed immediately as a charge to operating expenses in the statements of operations and comprehensive loss. As of December 31, 2016 and 2017, the Company had not recorded any deferred offering costs.

Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less at the date of purchase to be cash equivalents.

Property and Equipment

Property and equipment are stated at cost less accumulated depreciation and amortization. Depreciation and amortization expense is recognized using the straight-line method over the estimated useful life of each asset as follows:

	Estimated Useful Life
Lab equipment	5 years
Computer equipment	3 years
Furniture and fixtures	5 years
Leasehold improvements	Shorter of life of lease or estimated useful life

Upon retirement or sale, the cost of assets disposed of and the related accumulated depreciation and amortization are removed from the accounts and any resulting gain or loss is included in loss from operations. Expenditures for repairs and maintenance are charged to expense as incurred.

Impairment of Long-Lived Assets

Long-lived assets consist of property and equipment. Long-lived assets to be held and used are tested for recoverability whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable. Factors that the Company considers in deciding when to perform an impairment review include significant underperformance of the business in relation to expectations, significant negative industry or economic trends and significant changes or planned changes in the use of the assets. If an impairment review is performed to evaluate a long-lived asset group for recoverability, the Company compares forecasts of undiscounted cash flows expected to result from the use and eventual disposition of the long-lived asset group to its carrying value. An impairment loss would be recognized when estimated undiscounted future cash flows expected to result from the use of an asset group are less than its carrying amount. The impairment loss would be based on the excess of the carrying value of the impaired asset group over its fair value, determined based on discounted cash flows. The Company did not record any impairment losses on long-lived assets during the years ended December 31, 2016 or 2017.

Fair Value Measurements

Certain assets and liabilities are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. Financial assets and liabilities carried at fair value are to be classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to determining the fair value of the assets or liabilities, including pricing models, discounted cash flow methodologies and similar techniques.

The Company's cash equivalents are carried at fair value, determined according to the fair value hierarchy described above (see Note 3). The carrying values of the Company's other receivables, accounts payable and accrued expenses approximate their fair values due to the short-term nature of these assets and liabilities.

Classification and Accretion of Redeemable Convertible Preferred Stock

The Company has classified redeemable convertible preferred stock outside of stockholders' equity (deficit) because the shares contain certain redemption features that are not solely within the control of the Company. The Company immediately accretes the carrying value of its redeemable convertible preferred stock to redemption value at the end of each reporting period as if the end of the reporting period were the redemption date.

Segment Information

The Company manages its operations as a single segment for the purposes of assessing performance and making operating decisions. All of the Company's tangible assets are held in the United States.

Research and Development Costs

Research and development costs are expensed as incurred. Research and development expenses are comprised of costs incurred in performing research and development activities, including salaries, share-based compensation and benefits, facilities costs, depreciation, manufacturing expenses and external costs of outside vendors engaged to conduct preclinical development activities and clinical trials as well as the cost of licensing technology.

Upfront payments and milestone payments made for the licensing of technology are expensed as research and development in the period in which they are incurred. Advance payments for goods or services to be received in the future for use in research and development activities are recorded as prepaid expenses. The prepaid amounts are expensed as the related goods are delivered or the services are performed.

Research Contract Costs and Accruals

The Company has entered into various research and development contracts with research institutions and other companies both inside and outside of the United States. These agreements are generally cancelable, and related payments are recorded as research and development expenses as incurred. The Company records accruals for estimated ongoing research costs. When evaluating the adequacy of the accrued liabilities, the Company analyzes progress of the studies or trials, including the phase or completion of events, invoices received and contracted costs. Significant judgments and estimates are made in determining the accrued balances at the end of any reporting period. Actual results could differ from the Company's estimates. The Company's historical accrual estimates have not been materially different from the actual costs.

Patent Costs

All patent-related costs incurred in connection with filing and prosecuting patent applications are expensed as incurred due to the uncertainty about the recovery of the expenditure. Amounts incurred are classified as general and administrative expenses.

Stock-Based Compensation

The Company measures all stock-based awards granted to employees and directors based on the fair value on the date of grant. Compensation expense of those awards is recognized over the requisite service period, which is generally the vesting period of the respective award. Generally, the Company issues awards with only service-based vesting conditions and records the expense for these awards using the straight-line method. The Company accounts for forfeitures as they occur.

The Company measures the fair value of stock-based awards granted to non-employees on the date at which the related service is complete. Compensation expense is recognized over the period during which services are

[Table of Contents](#)

rendered by such non-employee consultants until completed. At the end of each financial reporting period prior to completion of the service, the fair value of these awards is remeasured using the then-current fair value of its common stock and updated assumption inputs in the Black-Scholes option-pricing model for options or the then-current fair value of its common stock for restricted stock.

The Company classifies stock-based compensation expense in its statements of operations and comprehensive loss in the same manner in which the award recipient's payroll costs are classified or in which the award recipient's service payments are classified.

Income Taxes

The Company accounts for income taxes using the asset and liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been recognized in the financial statements or in the Company's tax returns. Deferred taxes are determined based on the difference between the financial statement and tax basis of assets and liabilities using enacted tax rates in effect in the years in which the differences are expected to reverse. Changes in deferred tax assets and liabilities are recorded in the provision for income taxes. The Company assesses the likelihood that its deferred tax assets will be recovered from future taxable income and, to the extent it believes, based upon the weight of available evidence, that it is more likely than not that all or a portion of deferred tax assets will not be realized, a valuation allowance is established through a charge to income tax expense. Potential for recovery of deferred tax assets is evaluated by estimating the future taxable profits expected and considering prudent and feasible tax planning strategies.

The Company accounts for uncertainty in income taxes recognized in its financial statements by applying a two-step process to determine the amount of tax benefit to be recognized. First, the tax position must be evaluated to determine the likelihood that it will be sustained upon external examination by the taxing authorities. If the tax position is deemed more-likely-than-not to be sustained, the tax position is then assessed to determine the amount of benefit to recognize in the financial statements. The amount of the benefit that may be recognized is the largest amount that has a greater than 50% likelihood of being realized upon ultimate settlement. The provision for income taxes includes the effects of any resulting tax reserves, or unrecognized tax benefits, that are considered appropriate as well as the related net interest and penalties.

Comprehensive Loss

Comprehensive loss includes net loss as well as other changes in stockholders' deficit that result from transactions and economic events other than those with stockholders. There was no difference between net loss and comprehensive loss for each of the periods presented in the accompanying financial statements.

Net Loss per Share

The Company follows the two-class method when computing net income (loss) per share, as the Company has issued shares that meet the definition of participating securities. The two-class method determines net income (loss) per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income available to common stockholders for the period to be allocated between common and participating securities based upon their respective rights to receive dividends as if all income for the period had been distributed.

Basic net income (loss) per share attributable to common stockholders is computed by dividing the net income (loss) attributable to common stockholders by the weighted average number of shares of common stock outstanding for the period. Diluted net income (loss) attributable to common stockholders is computed by adjusting income (loss) attributable to common stockholders to reallocate undistributed earnings based on the potential impact of dilutive securities, including outstanding stock options and unvested restricted common stock.

Diluted net income (loss) per share attributable to common stockholders is computed by dividing the diluted net income (loss) attributable to common stockholders by the weighted average number of common shares outstanding for the period, including potential dilutive common shares assuming the dilutive effect of outstanding stock options and unvested restricted common stock.

The Company's outstanding redeemable convertible preferred stock contractually entitle the holders of such shares to participate in distributions but contractually does not require the holders of such shares to participate in losses of the Company. Similarly, restricted stock awards granted by the Company entitle the holder of such awards to dividends declared or paid by the board of directors, regardless of whether such awards are unvested, as if such shares were outstanding common shares at the time of the dividend. However, the unvested restricted stock awards are not entitled to share in the residual net assets (deficit) of the Company. Accordingly, in periods in which the Company reports a net loss attributable to common stockholders, diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders, since dilutive common shares are not assumed to have been issued if their effect is anti-dilutive.

The Company reported a net loss attributable to common stockholders for the years ended December 31, 2016 and 2017.

Recently Adopted Accounting Pronouncements

In August 2014, the Financial Accounting Standards Board ("FASB") issued ASU No. 2014-15, *Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern* ("ASU 2014-15"). The amendments in this update explicitly require a company's management to assess an entity's ability to continue as a going concern and to provide related footnote disclosures in certain circumstances. The new standard is effective for annual periods ending after December 15, 2016 and for interim periods thereafter. The Company adopted ASU 2014-15 as of the required effective date of December 31, 2016. This guidance relates to footnote disclosure only, and its adoption had no impact on the Company's financial position, results of operations or cash flows.

In November 2015, the FASB issued ASU No. 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes* ("ASU 2015-17"), which requires deferred tax liabilities and assets to be classified as non-current in the balance sheet. ASU 2015-17 is required to be adopted for annual periods beginning after December 15, 2016, including interim periods within those fiscal years. The amendment may be applied either prospectively to all deferred tax liabilities and assets or retrospectively to all periods presented. The Company elected to early adopt the standard on January 1, 2016 and has reflected the adoption retrospectively to all periods presented. The adoption of ASU 2015-17 had no impact on the Company's financial position, results of operations or cash flows.

In March 2016, the FASB issued ASU No. 2016-09, *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting* ("ASU 2016-09"). ASU 2016-09 includes multiple provisions intended to simplify various aspects of the accounting for share-based payments, including the income tax consequences, classification of awards as either equity or liabilities, an option to recognize gross share compensation expense with actual forfeitures recognized as they occur, as well as certain classifications on the statement of cash flows. The Company elected to early adopt the standard on January 1, 2016 and has reflected the adoption in the financial statements of the Company retrospectively to all periods presented. The adoption of ASU 2016-09 had no material impact on the Company's financial position, results of operations or cash flows. The Company elected to account for forfeitures as they occur rather than apply an estimated forfeiture rate to stock-based compensation expense.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases* ("ASU 2016-02"). ASU 2016-02 will require lessees to recognize most leases on their balance sheet as a right-of-use asset and a lease liability. Leases will be

[Table of Contents](#)

classified as either operating or finance, and classification will be based on criteria similar to current lease accounting, but without explicit bright lines. For public entities, the guidance is effective for annual reporting periods beginning after December 15, 2018 and for interim periods within those fiscal years. For non-public entities, the guidance is effective for annual reporting periods beginning after December 15, 2019. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2016-02 will have on its financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows: Classification of Certain Cash Receipts and Cash Payments* (“ASU 2016-15”), to address diversity in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. For public entities, the standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. For non-public entities, the standard is effective for annual periods beginning after December 15, 2018. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2016-15 will have on its financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Statement of Cash Flows (Topic 230)* (“ASU 2016-18”), which requires that amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. For public entities, ASU 2016-18 is effective for fiscal years beginning after December 15, 2017 and interim periods within those fiscal years. For non-public entities, the standard is effective for fiscal years beginning after December 15, 2018. Early adoption is permitted for all entities. The Company is currently evaluating the impact of ASU 2016-18 on its financial statements.

In May 2017, the FASB issued ASU No. 2017-09, *Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting* (“ASU 2017-09”), which clarifies when to account for a change to the terms or conditions of a share-based payment award as a modification. Under the new guidance, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award (as equity or liability) changes as a result of the change in terms or conditions. For public and non-public entities, the standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. Early adoption is permitted. The Company is currently evaluating the impact that the adoption of ASU 2017-09 will have on its financial statements. The Company does not expect that the adoption of ASU 2017-09 will have a material impact on its financial statements.

In July 2017, the FASB issued ASU No. 2017-11, *Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815) I. Accounting for Certain Financial Instruments with Down Round Features II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception* (“ASU 2017-11”). Part I applies to entities that issue financial instruments such as warrants, convertible debt or convertible preferred stock that contain down-round features. Part II replaces the indefinite deferral for certain mandatorily redeemable noncontrolling interests and mandatorily redeemable financial instruments of nonpublic entities contained within ASC Topic 480 with a scope exception and does not impact the accounting for these mandatorily redeemable instruments. For public entities, ASU 2017-11 is required to be adopted for annual periods beginning after December 15, 2018, including interim periods within those fiscal years. For non-public entities, ASU 2017-11 is effective for annual periods beginning after December 15, 2019. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2017-11 will have on its financial statements.

[Table of Contents](#)

3. Fair Value of Financial Assets

The following tables present information about the Company's financial assets measured at fair value on a recurring basis and indicate the level of the fair value hierarchy utilized to determine such fair values (in thousands):

	Fair Value Measurements at December 31, 2017 Using			Total
	Level 1	Level 2	Level 3	
Cash equivalents:				
Money market funds	\$51,147	\$ —	\$ —	\$51,147
Total	\$51,147	\$ —	\$ —	\$51,147

The Company had no cash equivalents as of December 31, 2016. During the year ended December 31, 2017, there were no transfers between Level 1, Level 2 and Level 3.

4. Property and Equipment, Net

Property and equipment, net consisted of the following (in thousands):

	December 31,	
	2016	2017
Laboratory and computer equipment	\$514	\$2,120
Leasehold improvements	—	141
Furniture and fixtures	—	77
	514	2,338
Less: Accumulated depreciation and amortization	(6)	(382)
	\$508	\$1,956

Depreciation and amortization expense was less than \$0.1 million and \$0.4 million for the years ended December 31, 2016 and 2017, respectively.

5. Accrued Expenses

Accrued expenses consisted of the following (in thousands):

	December 31,	
	2016	2017
Accrued external research and development expenses	\$—	\$1,531
Accrued payroll and related expenses	506	1,330
Accrued professional fees	66	963
Accrued other	61	151
	\$633	\$3,975

6. Convertible Promissory Notes

In December 2015, the Company issued convertible promissory notes in the aggregate principal amount of \$0.5 million. In 2016, the Company issued convertible promissory notes in the amount of \$6.5 million. The notes accrued interest at an annual rate of 6% payable upon maturity at one year after issuance. In November 2016, the total outstanding principal and accrued interest on the notes of \$7.2 million converted into 7,163,984 shares of

the Company's Series A redeemable convertible preferred stock (the "Series A Preferred Stock") at a price of \$1.00 per share. The convertible promissory notes did not contain any features which were required to be bifurcated and accounted for separately.

7. Redeemable Convertible Preferred Stock

As of December 31, 2017, the Company's certificate of incorporation, as amended and restated (the "Certificate of Incorporation"), authorized the Company to issue 49,178,527 shares of \$0.001 par value preferred stock, of which 35,663,974 shares have been designated as Series A Preferred Stock and 13,514,553 shares have been designated as Series B redeemable convertible preferred stock (the "Series B Preferred Stock"). The Series A Preferred Stock and Series B Preferred Stock are collectively referred to as the "Preferred Stock".

Series A Preferred Stock Purchase Agreement

In November 2016, the Company entered into a Series A Preferred Stock purchase agreement and issued 17,718,974 shares of Series A Preferred Stock at \$1.00 per share for gross proceeds of \$10.6 million and the conversion of principal and accrued interest of \$7.2 million on convertible promissory notes (see Note 6). Cash proceeds of \$6.3 million were received in January 2017 and therefore, classified as other receivable in the Company's balance sheet at December 31, 2016. The Company incurred issuance costs of \$0.1 million in connection with the issuance and sale of the Series A Preferred Stock.

The Series A Preferred Stock purchase agreement obligated the Company to sell and the Purchasers (as defined) to purchase at \$1.00 per share an aggregate of 15,445,000 shares of Series A Preferred Stock at a subsequent closing (the "First Subsequent Closing") and at the Company's sole discretion an aggregate of 15,500,000 shares of Series A Preferred Stock at a second subsequent closing (the "Second Subsequent Closing"), upon the achievement or waiver of certain milestones. In April 2017, in connection with the First Subsequent Closing and the waiver of the applicable milestones, the Company received gross proceeds of \$15.4 million for the issuance and sale of 15,445,000 shares of Series A Preferred Stock. The Company determined that the future tranche obligations of the Series A Preferred Stock purchase agreement did not meet the definition of a freestanding financial instrument because, while separately exercisable, it was not legally detachable. Further, the Company determined that the embedded future tranche obligation did not require bifurcation for accounting purposes as it was clearly and closely related to the economic characteristics and risks of the initial preferred shares and would not meet the definition of a derivative on a standalone basis. There was no Second Subsequent Closing.

Series B Preferred Stock Purchase Agreement

In April 2017, the Company entered into a Series B Preferred Stock purchase agreement and issued and sold 12,871,003 shares of Series B Preferred Stock at \$3.8847 per share for gross proceeds of \$50.0 million in two separate closings. The Company incurred issuance costs of \$0.2 million in connection with the issuance and sale of the Series B Preferred Stock.

Issuance of Preferred Stock for License

In consideration for the grant of rights to the Company pursuant to a license agreement between the Company and Novartis International Pharmaceutical Ltd., ("Novartis"), dated April 3, 2017 (see Note 11), the Company issued 2,500,000 shares of Series A Preferred Stock and 643,550 shares of Series B Preferred Stock to Novartis.

Upon issuance of each class of Preferred Stock the Company assessed the embedded conversion and liquidation features of the securities and determined that such features did not require the Company to separately account for these features. The Company also concluded that no beneficial conversion feature existed upon the issuance date of each class of Preferred Stock.

[Table of Contents](#)

As of each balance sheet date, the Preferred Stock consisted of the following (in thousands, except share amounts):

	December 31, 2016				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred Stock	48,700,000	17,718,974	\$17,916	\$ 17,916	17,718,974
	<u>48,700,000</u>	<u>17,718,974</u>	<u>\$17,916</u>	<u>\$ 17,916</u>	<u>17,718,974</u>

	December 31, 2017				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred Stock	35,663,974	35,663,974	\$39,939	\$ 35,664	35,663,974
Series B Preferred Stock	13,514,553	13,514,553	52,500	52,500	13,514,553
	<u>49,178,527</u>	<u>49,178,527</u>	<u>\$92,439</u>	<u>\$ 88,164</u>	<u>49,178,527</u>

The holders of the Preferred Stock have the following rights and preferences:

Voting Rights

The holders of Preferred Stock are entitled to vote, together with the holders of common stock, on all matters submitted to stockholders for a vote. Each preferred stockholder is entitled to the number of votes equal to the number of shares of common stock into which each Preferred Stock is convertible at the time of such vote.

Dividends

There are no stated dividends on the Preferred Stock.

At the time of issuance, the holders of Series A Preferred Stock were entitled to receive cumulative dividends at an annual rate of 8% of the Original Issue Price (as described below). However, in connection with the Series B Preferred Stock financing in April 2017, holders of Series A Preferred Stock waived their right to dividends. During the years ended December 31, 2016 and 2017, the Company accrued dividends of \$0.2 million and \$0.4 million, respectively, and recorded an increase to the carrying value of the Series A Preferred Stock with an offset to additional paid in capital. In April 2017, in connection with the elimination of dividends on the Series A Preferred Stock, the Company reduced the carrying value of the Series A Preferred Stock by \$0.6 million with an offset to additional paid in capital.

The Company may not declare, pay or set aside any dividends on shares of any other class or series of capital stock of the Company unless the holders of Preferred Stock then outstanding shall first receive, or simultaneously receive, dividends on each outstanding share of Preferred Stock. Through December 31, 2017, no dividends had been approved or paid.

Liquidation

In the event of any liquidation, dissolution or winding up of the Company or Liquidating Event (as described below), the holders of Preferred Stock then outstanding shall be entitled, on a pari passu basis, to be paid out of the assets of the Company prior to any payments made to the holders of common stock by reason of their ownership thereof, an amount per share equal to the greater of the Original Issue Price (as described below)

[Table of Contents](#)

plus any dividends declared but unpaid or such amount per share as would have been payable had all shares of Preferred Stock been converted into common stock. If upon liquidation the assets of the Company available for distribution to its stockholders shall be insufficient to pay the holders of Preferred Stock the full amount, the holders of the shares of Preferred Stock shall share ratably in any distribution in proportion to respective amount of Preferred Stock.

Upon completion of the liquidation preference distribution to the holders of Preferred Stock, the remaining assets of the Company will be distributed among holders of common stock, pro rata, based on the number of shares held by each such holder.

Unless the holders of a majority of the outstanding Preferred Stock, voting together as a single class, and in certain circumstances, holders of a majority of the outstanding Series B Preferred Stock, voting as a separate class, elect otherwise, Liquidating Event shall include a merger or consolidation (other than one in which shareholders of the Company own a majority of the voting power of the outstanding shares of the surviving or acquiring corporation) or a sale, lease, transfer, exclusive license or other disposition of all or substantially all of the assets of the Company.

Conversion

Each share of Preferred Stock is convertible at the option of the stockholder at any time without the payment of additional consideration by the holder thereof, into a number of shares of common stock at the applicable conversion ratio determined by dividing the Original Issue Price by the Conversion Price of each series. The Original Issue Price is \$1.00 per share for Series A Preferred Stock and \$3.8847 per share for Series B Preferred Stock. The Conversion Price is \$1.00 per share for Series A Preferred Stock and \$3.8847 per share for Series B Preferred Stock, subject to appropriate adjustment in the event of any stock split, stock dividend, combination or other similar recapitalization and other adjustments as set forth in the Company's certificate of incorporation, as amended and restated.

Each share of Preferred Stock will automatically convert into shares of common stock at the then effective conversion ratio (i) upon the closing of an initial public offering with proceeds to the Company of at least \$50.0 million, after deducting underwriting discounts and commissions or (ii) upon the vote or written consent of the holders of a majority of the then outstanding shares of the Preferred Stock, voting together as a single class, and holders of a majority of the outstanding Series B Preferred Stock, voting as a separate class.

As of December 31, 2016 and 2017, all outstanding Preferred Stock were convertible into common stock on a one-for-one basis.

Redemption Rights

At any time on or after April 21, 2022, shares of the Preferred Stock are subject to mandatory redemption by the Company in three equal annual installments beginning 60 days after receipt of a notice of redemption from the holders of a majority of the voting power of the holders of the outstanding Preferred Stock, voting as a single class. As of December 31, 2017, the redemption price for the Preferred Stock is equal to the Original Issuance Price per share, plus any accruing dividends accrued but unpaid therein.

Reissuance

Shares of any Preferred Stock that are redeemed or converted will be retired or canceled and may not be reissued by the Company.

8. Common Stock

As of December 31, 2017, the Company's Certificate of Incorporation authorized the Company to issue 70,000,000 shares of common stock, \$0.001 par value. Each share of common stock entitles the holder to one

vote on all matters submitted to a vote of the Company's stockholders. Common stockholders are not entitled to receive dividends unless declared by the board of directors.

The Company issued 500,000 shares of common stock to two investors in exchange for consulting services (see Note 14). In 2016, the Company issued 995,000 shares of common stock in connection with a license agreement (see Note 11). In 2016 and 2017, the Company issued 11,310,853 and 565,000 shares, respectively, of restricted stock to employees and consultants of the Company. Unvested shares of restricted stock may not be sold or transferred by the holder. These restrictions lapse according to the vesting conditions of each award (see Note 9).

9. Stock-Based Compensation

2016 Stock Option and Grant Plan

In November 2016, the Company's 2016 Stock Option and Grant Plan, (the "2016 Plan") was approved by the Company's stockholders. The 2016 Plan provides for the Company to sell or issue restricted common stock or to grant stock options for the purchase of common stock to employees, members of the board of directors and consultants of the Company. The 2016 Plan is administered by the board of directors, or at the discretion of the board of directors, by a committee of the board. The exercise prices, vesting and other restrictions are determined at the discretion of the board of directors, or their committee if so delegated, except that the term of awards may not be greater than ten years. Vesting periods are determined at the discretion of the board of directors. Awards granted to employees and directors typically vest over three or four years.

The exercise price for stock options granted may not be less than the fair value of common shares as determined by the board of directors as of the date of grant. The Company's board of directors values the Company's common stock, taking into consideration its most recently available valuation of common stock performed by third parties as well as additional factors which may have changed since the date of the most recent contemporaneous valuation through the date of grant.

The total number of shares of common stock that may be issued under the 2016 Plan was 10,377,440 shares as of December 31, 2017, of which 4,538,087 shares remained available for future grant as of December 31, 2017.

Common Stock Option Valuation

The fair value of stock option grants is estimated using the Black-Scholes option-pricing model. The Company historically has been a private company and lacks company-specific historical and implied volatility information. Therefore, the Company estimates its expected stock volatility based on the historical volatility of a publicly traded set of peer companies and expects to continue to do so until such time as it has adequate historical data regarding the volatility of its own traded stock price. For options with service-based vesting conditions, the expected term of the Company's stock options has been determined utilizing the "simplified" method for awards that qualify as "plain-vanilla" options. The expected term of stock options granted to non-employees is equal to the contractual term of the option award. The risk-free interest rate is determined by reference to the U.S. Treasury yield curve in effect at the time of grant of the award for time periods approximately equal to the expected term of the award. Expected dividend yield is based on the fact that the Company has never paid cash dividends and does not expect to pay any cash dividends in the foreseeable future.

[Table of Contents](#)

The assumptions that the Company used to determine the fair value of options granted to employees and directors were as follows, presented on a weighted average basis:

	Year Ended December 31, 2017
Risk-free interest rate	2.0%
Expected term (in years)	6.0
Expected volatility	78.1%
Expected dividend yield	0%

There were no common stock options granted during the year ended December 31, 2016.

Common Stock Option Activity

The following table summarizes the Company's option activity since December 31, 2016:

	<u>Number of Shares</u>	<u>Weighted Average Exercise Price</u>	<u>Weighted Average Remaining Contractual Term (in years)</u>	<u>Aggregate Intrinsic Value (in thousands)</u>
Outstanding as of December 31, 2016	—	\$ —		
Granted	1,613,500	1.87		
Exercised	—	—		
Forfeited	—	—		
Outstanding as of December 31, 2017	<u>1,613,500</u>	\$ 1.87	9.8	\$ 1,791
Options vested and expected to vest as of December 31, 2017	<u>1,613,500</u>	\$ 1.87	9.8	\$ 1,791
Options exercisable as of December 31, 2017	<u>25,312</u>	\$ 1.87	9.7	\$ 28

The aggregate intrinsic value of options is calculated as the difference between the exercise price of the options and the fair value of the Company's common stock for those options that had exercise prices lower than the fair value of the Company's common stock.

The weighted average grant-date fair value per share of options granted during the year ended December 31, 2017 was \$1.27.

Restricted Stock Activity

Unvested shares of restricted stock may not be sold or transferred by the holder. These restrictions lapse according to the time-based vesting conditions of each award.

[Table of Contents](#)

The table below summarizes the Company's restricted stock activity for grants issued under the 2016 Plan:

	Number of Shares	Weighted Average Grant Date Fair Value
Outstanding as of December 31, 2015	—	\$ —
Granted	11,310,853	0.32
Vested	(1,998,529)	0.32
Forfeited	—	—
Outstanding as of December 31, 2016	9,312,324	\$ 0.32
Granted	565,000	1.87
Vested	(2,582,048)	0.32
Forfeited	(1,850,000)	0.32
Outstanding as of December 31, 2017	<u>5,445,276</u>	<u>\$ 0.48</u>

The total fair value of restricted stock vested during the year ended December 31, 2017 was \$1.9 million.

As of December 31, 2016 and 2017, there were 3,905,420 and 1,618,545, respectively, of unvested shares of restricted stock held by non-employees.

Stock-Based Compensation

Stock-based compensation expense was classified in the statements of operations and comprehensive loss as follows (in thousands):

	Year Ended December 31,	
	2016	2017
Research and development expenses	\$427	\$1,626
General and administrative expenses	235	633
	<u>\$662</u>	<u>\$2,259</u>

As of December 31, 2017, total unrecognized compensation cost related to the unvested stock-based awards was \$8.6 million, which is expected to be recognized over a weighted average period of 2.6 years.

10. Net Loss per Share and Unaudited Pro Forma Net Loss per Share

Net Loss per Share

Basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	<u>Year Ended December 31,</u>	
	<u>2016</u>	<u>2017</u>
Numerator:		
Net loss	\$ (9,431)	\$ (35,491)
Accretion of redeemable convertible preferred stock to redemption value	(107)	(213)
Cumulative dividends on redeemable convertible preferred stock	(197)	(437)
Reversal of cumulative dividends on redeemable convertible preferred stock	—	634
Net loss attributable to common stockholders	<u>\$ (9,735)</u>	<u>\$ (35,507)</u>
Denominator:		
Weighted average common shares outstanding—basic and diluted	<u>386,083</u>	<u>4,798,213</u>
Net loss per share attributable to common stockholders—basic and diluted	<u>\$ (25.21)</u>	<u>\$ (7.40)</u>

Common Stock Equivalents

The following common stock equivalents presented based on amounts outstanding at each period end, have been excluded from the calculation of diluted net loss per share because including them would have had an anti-dilutive impact:

	<u>December 31,</u>	
	<u>2016</u>	<u>2017</u>
Redeemable convertible preferred stock (as converted to common stock)	17,718,974	49,178,527
Stock options to purchase common stock	—	1,613,500
Unvested restricted common stock	9,312,324	5,445,276
	<u>27,031,298</u>	<u>56,237,303</u>

Unaudited Pro Forma Net Loss per Share

The unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2017 gives effect to adjustments arising upon the closing of the proposed initial public offering. The unaudited pro forma net loss attributable to common stockholders used in the calculation of unaudited basic and diluted pro forma net loss per share attributable to common stockholders does not include the effects of the accretion on redeemable convertible preferred stock, because it assumes that the conversion of redeemable convertible preferred stock into common stock had occurred on the later of January 1, 2017 or the issuance date of the redeemable convertible preferred stock.

The unaudited pro forma basic and diluted weighted average common shares outstanding used in the calculation of unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the year ended December 31, 2017 gives effect to the automatic conversion upon the closing of the proposed initial public offering of all outstanding shares of redeemable convertible preferred stock as of December 31, 2017 into 49,178,527 shares of common stock as if the conversion had occurred on the later of January 1, 2017 or the issuance date of the redeemable convertible preferred stock.

[Table of Contents](#)

Unaudited pro forma basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Year Ended December 31, 2017 (unaudited)
Numerator:	
Net loss attributable to common stockholders	\$ (35,507)
Accretion of redeemable convertible preferred stock to redemption value	213
Cumulative dividends on redeemable convertible preferred stock	437
Reversal of cumulative dividends on redeemable convertible preferred stock	(634)
Pro forma net loss attributable to common stockholders	<u>\$ (35,491)</u>
Denominator:	
Weighted average common shares outstanding—basic and diluted	4,798,213
Pro forma adjustment to reflect assumed automatic conversion of redeemable convertible preferred shares upon the closing of the proposed initial public offering	<u>39,496,161</u>
Pro forma weighted average common shares outstanding—basic and diluted	<u>44,294,374</u>
Pro forma net loss per share attributable to common shareholders—basic and diluted	<u>\$ (0.80)</u>

11. Commitments and Contingencies

Leases

The Company entered into an eighteen-month sublease for office space in Cambridge, Massachusetts that began in February 2017 and expires in August 2018. The Company is required to maintain a cash balance of \$0.2 million to secure a letter of credit associated with the lease. This amount was classified as restricted cash in the balance sheet at December 31, 2017. Prior to the current lease, the Company leased office space in Cambridge, Massachusetts on a month-to-month basis for which the Company was required to maintain a cash balance of less than \$0.1 million to secure a letter of credit for the benefit of the landlord. This amount was classified as restricted cash in the balance sheet at December 31, 2016.

The Company recorded rent expense of less than \$0.1 million and \$1.1 million during the years ended December 31, 2016 and 2017, respectively.

As of December 31, 2017, the Company has future minimum lease payments due under the operating lease of \$0.6 million to be paid in 2018.

Intellectual Property Licenses

In November 2016, the Company entered into a license agreement with the President and Fellows of Harvard College (“Harvard”) for an exclusive, worldwide, royalty-bearing license for certain technologies related to conditioning and mobilization. In consideration for these rights the Company paid Harvard an upfront fee of \$0.1 million and reimbursed Harvard \$0.3 million for costs incurred by Harvard related to the patented technology, which amounts were recorded as research and development expense during the year ended December 31, 2016. The Company also issued 995,000 shares of common stock in connection with the license agreement. The fair value of the shares of \$0.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2016. The Company is obligated to pay Harvard maintenance fees of less than \$0.1 million annually through 2019 and \$0.1 million annually thereafter and to reimburse qualified expenses related to the patents. The Company is also obligated to pay milestone payments of up to \$7.4 million for the first two licensed products upon the achievement of certain development and regulatory milestones and to pay royalties on a product-by-product and country-by-country basis on net sales of products licensed under the agreement.

In April 2017, the Company entered into a license agreement with Novartis to use and develop certain patent rights (the “Novartis License”). Under the Novartis License the Company was granted an exclusive, worldwide, sublicensable license to research, develop and commercialize certain licensed products that contain Novartis compounds for the expansion of cord blood derived non-gene-edited/-modified hematopoietic stem cells. In consideration for these rights, the Company issued 2,500,000 shares of Series A Preferred Stock and 643,550 shares of Series B Preferred Stock to Novartis. The total fair value of the shares of \$9.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2017. The Company is obligated to make payments of up to \$177.0 million upon the achievement of specified clinical and regulatory milestones and up to \$125.0 million upon the achievement of specified commercial milestones and to pay tiered royalties, on a product-by-product and country-by-country basis, up to a maximum of 20% on net sales of products licensed under the agreement.

The Company has agreements with third parties in the normal course of business under which it can license certain developed technologies. If the Company exercises its rights to license the respective technologies it may be subject to additional fees and milestone payments. As of December 31, 2017, the Company has not exercised its rights to license such technologies.

Indemnification Agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and senior management that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material costs as a result of such indemnifications. The Company is not aware of any claims under indemnification arrangements, and it has not accrued any liabilities related to such obligations in its financial statements as of December 31, 2016 or 2017.

Legal Proceedings

The Company is not currently a party to any material legal proceedings. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company expenses the costs related to its legal proceedings as they are incurred.

12. 401(k) Savings Plan

The Company has a 401(k) available for participating employees who meet certain eligibility requirements. Eligible employees may defer a portion of their salary as defined by the plan. Company contributions to the plan may be made at the discretion of the Board of Directors of the Company. To date, the Company has not made any contributions to the plan.

13. Income Taxes

2017 U.S. Tax Reform

On December 22, 2017, the Tax Cuts and Jobs Act (the “TCJA”) was signed into United States law. The TCJA includes a number of changes to existing tax law, including, among other things, a permanent reduction in the federal corporate income tax rate from 35% to 21%, effective as of January 1, 2018, as well as limitation of the deduction for net operating losses to 80% of annual taxable income and elimination of net operating loss

Table of Contents

carrybacks, in each case, for losses arising in taxable years beginning after December 31, 2017 (though any such net operating losses may be carried forward indefinitely). The tax rate change resulted in (i) a reduction in the gross amount of the Company's deferred tax assets recorded as of December 31, 2017, without an impact on the net amount of its deferred tax assets, which are recorded with a full valuation allowance, and (ii) no income tax expense or benefit being recognized as of the enactment date of the TCJA.

The staff of the Securities and Exchange Commission issued Staff Accounting Bulletin No. 118 to address the application of GAAP in situations when a registrant does not have the necessary information available, prepared or analyzed (including computations) in reasonable detail to complete the accounting for certain income tax effects of the TCJA. In connection with the initial analysis of the impact of the TCJA, the Company remeasured its deferred tax assets and liabilities based on the rates at which they are expected to reverse in the future, which is generally 21% for federal tax purposes. The remeasurement of the Company's deferred tax assets and liabilities resulted in a provision of \$4.8 million to income tax expense which was offset by a corresponding decrease in the valuation allowance.

During the years ended December 31, 2016 and 2017, the Company recorded no income tax benefits for the net operating losses incurred or for the research and development tax credits generated in each year, due to its uncertainty of realizing a benefit from those items.

A reconciliation of the U.S. federal statutory income tax rate to the Company's effective income tax rate is as follows:

	Year Ended December 31,	
	2016	2017
Federal statutory income tax rate	34.0%	34.0%
State taxes, net of federal benefit	4.6	4.9
Federal research and development tax credit	1.8	3.4
Impact of 2018 tax rate change on temporary differences	—	(13.4)
Other	(4.2)	(3.7)
Increase in deferred tax asset valuation allowance	(36.2)	(25.2)
Effective income tax rate	— %	— %

Net deferred tax assets as of December 31, 2016 and 2017 consisted of the following (in thousands):

	December 31,	
	2016	2017
Deferred tax assets:		
Net operating loss carryforwards	\$ 3,072	\$ 5,158
Intangible assets	33	5,925
Research and development tax credit carryforwards	183	1,400
Other	261	29
Total deferred tax assets	3,549	12,512
Valuation allowance	(3,540)	(12,466)
Net deferred tax assets	9	46
Deferred tax liabilities:		
Depreciation and amortization	(9)	(46)
Total deferred tax liabilities	(9)	(46)
Net deferred tax assets and liabilities	\$ —	\$ —

[Table of Contents](#)

As of December 31, 2017, the Company had net operating loss carryforwards for federal and state income tax purposes of \$18.7 million and \$19.3 million, respectively, which begin to expire in 2035. As of December 31, 2017, the Company also had available research and development tax credit carryforwards for federal and state income tax purposes of \$1.0 million and \$0.4 million, respectively, which begin to expire in 2035 and 2030, respectively. Utilization of the net operating loss carryforwards and research and development tax credit carryforwards may be subject to a substantial annual limitation under Section 382 of the Internal Revenue Code of 1986, as amended (the "Code") due to ownership changes that have occurred previously or that could occur in the future. These ownership changes may limit the amount of carryforwards that can be utilized annually to offset future taxable income. The Company has not conducted a formal study to assess whether a change of control has occurred or whether there have been multiple changes of control since inception due to the significant complexity and cost associated with such a study. If the Company has experienced a change of control, as defined by Section 382 and 383 of the Code, at any time since inception, utilization of the net operating loss carryforwards or research and development tax credit carryforwards may be subject to an annual limitation under Section 382 and 383 of the Code, which is determined by first multiplying the value of the Company's stock at the time of the ownership change by the applicable long-term tax-exempt rate, and then could be subject to additional adjustments, as required. Any limitation may result in expiration of a portion of the net operating loss carryforwards or research and development tax credit carryforwards before utilization.

The Company has evaluated the positive and negative evidence bearing upon its ability to realize the deferred tax assets. The Company considered its history of cumulative net losses incurred since inception and its lack of commercialization of any products since inception and has concluded that it is more likely than not that the Company will not realize the benefits of the deferred tax assets. Accordingly, a full valuation allowance has been established against the deferred tax assets as of December 31, 2016 and 2017. The Company reevaluates the positive and negative evidence at each reporting period.

Changes in the valuation allowance for deferred tax assets during the years ended December 31, 2016 and 2017 related primarily to the increase in net operating loss carryforwards and research and development tax credit carryforwards, partially offset in 2017 by a decrease in deferred tax assets resulting from the decreased federal corporate tax rate, and were as follows (in thousands):

	Year Ended December 31,	
	2016	2017
Valuation allowance as of beginning of year	\$ 129	\$ 3,540
Net increases recorded to income tax provision	3,411	8,926
Valuation allowance as of end of year	<u>\$3,540</u>	<u>\$12,466</u>

The Company has not recorded any amounts for unrecognized tax benefits as of December 31, 2016 or 2017.

The Company files tax returns as prescribed by the tax laws of the jurisdictions in which it operates. In the normal course of business, the Company is subject to examination by federal and state jurisdictions, where applicable. There are currently no pending income tax examinations. The Company's tax years are open under statute from 2015, the inception of the Company, to the present. The Company's policy is to record interest and penalties related to income taxes as part of its income tax provision.

14. Related Parties

Atlas Venture Life Science Advisors LLC and Third Rock Ventures LLC

During the years ended December 31, 2016 and 2017, the Company received consulting, advisory and related services from Atlas Venture Life Science Advisors LLC and Third Rock Ventures LLC, holders, together

with their affiliates, of more than 5% of the Preferred Stock. For the years ended December 31, 2016 and 2017, the Company recorded \$1.1 million and \$0.2 million, respectively, of general and administrative expenses for management and advisory services and other related services provided by these investors. The Company also issued 250,000 shares of common stock to each investor and recorded \$0.2 million of general and administrative expense for the year ended December 31, 2016 related to these shares. As of December 31, 2016, amounts owed to these investors were \$0.1 million which were included in accounts payable and accrued expenses. There were no amounts owed as of December 31, 2017.

Novartis

In April 2017, the Company entered into a license agreement with Novartis, a beneficial owner of 5% or more of its outstanding shares of capital stock, to use and develop certain patent rights. In consideration for these rights, the Company issued 2,500,000 shares of Series A Preferred Stock and 643,550 shares of Series B Preferred Stock to Novartis. The fair value of the shares of \$9.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2017 (see Note 11).

15. Subsequent Events

For its financial statements as of December 31, 2017 and for the year then ended, the Company evaluated subsequent events through May 7, 2018, the date on which those financial statements were issued.

Collaboration Agreement

In March 2018, the Company entered into a collaboration agreement with Heidelberg Pharma Research GmbH, (“HDPR”) whereby the parties agreed to combine the Company’s stem cell platform with proprietary antibodies across up to four exclusive targets with HDPR’s proprietary Antibody Targeted Amanitin Conjugates platform. Under the agreement, the Company may pay upfront technology access fees, research exclusivity fees and payment for research support. Additionally, upon the exercise of certain license rights, the Company may be obligated to pay HDPR development, regulatory and commercial milestone payments of up to \$83.5 million per target as well as royalties on net sales of products licensed under the agreement.

Sale of Shares of Series C Redeemable Convertible Preferred Shares

In April 2018, the Company entered into a Series C Preferred Stock purchase agreement, pursuant to which the Company sold 11,223,102 shares of Series C redeemable convertible Preferred Stock at a price of \$4.66 per share for total gross proceeds of \$52.3 million. In connection with the Series C Preferred Stock purchase agreement, the Company’s Certificate of Incorporation was amended and restated to authorize the Company to issue 11,226,000 shares of Series C Preferred Stock and to increase the number of common stock authorized from 70,000,000 to 85,000,000 shares. In addition, the redemption date of the Preferred Stock was changed from any time on or after April 21, 2022, to the fifth anniversary of the Series C original issue date, or April 2, 2023.

2016 Equity Plan

In April 2018, the 2016 Plan was amended to increase the number of shares reserved for issuance under the 2016 Plan by 4,870,417 shares.

MAGENTA THERAPEUTICS, INC.

BALANCE SHEETS

(In thousands, except share and per share amounts)
(Unaudited)

	December 31, 2017	March 31, 2018	Pro Forma March 31, 2018
Assets			
Current assets:			
Cash and cash equivalents	\$ 51,402	\$ 41,462	\$ 41,462
Restricted cash	165	165	165
Prepaid expenses and other current assets	936	1,000	1,000
Total current assets	52,503	42,627	42,627
Property and equipment, net	1,956	2,055	2,055
Deferred offering costs	—	1,396	1,396
Other assets	4	—	—
Total assets	<u>\$ 54,463</u>	<u>\$ 46,078</u>	<u>\$ 46,078</u>
Liabilities, Redeemable Convertible Preferred Stock and Stockholders' Equity (Deficit)			
Current liabilities:			
Accounts payable	\$ 167	\$ 1,731	\$ 1,731
Accrued expenses	3,975	3,762	3,762
Total current liabilities	<u>4,142</u>	<u>5,493</u>	<u>5,493</u>
Commitments and contingencies (Note 8)			
Redeemable convertible preferred stock (Series A and B), \$0.001 par value; 49,178,527 shares authorized as of December 31, 2017 and March 31, 2018; 49,178,527 shares issued and outstanding as of December 31, 2017 and March 31, 2018; aggregate liquidation preference of \$88,164 as of March 31, 2018; no shares authorized, issued or outstanding, pro forma as of March 31, 2018	<u>92,439</u>	<u>92,439</u>	<u>—</u>
Stockholders' Equity (Deficit):			
Common stock, \$0.001 par value; 70,000,000 shares authorized as of December 31, 2017 and March 31, 2018; 11,520,853 and 11,494,853 shares issued and 6,075,577 and 6,770,806 shares outstanding as of December 31, 2017 and March 31, 2018; respectively; 60,673,380 shares issued and 55,949,333 shares outstanding, pro forma as of March 31, 2018	6	7	56
Additional paid-in capital	3,087	4,511	96,901
Accumulated deficit	<u>(45,211)</u>	<u>(56,372)</u>	<u>(56,372)</u>
Total stockholders' equity (deficit)	<u>(42,118)</u>	<u>(51,854)</u>	<u>40,585</u>
Total liabilities, redeemable convertible preferred stock and stockholders' equity (deficit)	<u>\$ 54,463</u>	<u>\$ 46,078</u>	<u>\$ 46,078</u>

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF OPERATIONS AND COMPREHENSIVE LOSS

(In thousands, except share and per share amounts)
(Unaudited)

	Three Months Ended March 31,	
	2017	2018
Revenue	\$ —	\$ —
Operating expenses:		
Research and development	3,322	7,849
General and administrative	1,489	3,457
Total operating expenses	4,811	11,306
Loss from operations	(4,811)	(11,306)
Other income (expense):		
Interest and other income, net	—	145
Total other income (expense), net	—	145
Net loss and comprehensive loss	(4,811)	(11,161)
Cumulative dividends on redeemable convertible preferred stock	(354)	—
Net loss attributable to common stockholders	\$ (5,165)	\$ (11,161)
Net loss per share attributable to common stockholders—basic and diluted	\$ (1.39)	\$ (1.75)
Weighted average common shares outstanding—basic and diluted	3,716,695	6,373,006
Pro forma net loss per share attributable to common stockholders—basic and diluted		\$ (0.20)
Pro forma weighted average common shares outstanding—basic and diluted		55,551,533

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

STATEMENTS OF CASH FLOWS

(In thousands)
(Unaudited)

	Three Months Ended	
	March 31,	
	2017	2018
Cash flows from operating activities:		
Net loss	\$(4,811)	\$(11,161)
Adjustments to reconcile net loss to net cash used in operating activities:		
Stock-based compensation expense	314	1,425
Depreciation and amortization expense	33	147
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	(81)	(60)
Accounts payable	(246)	1,206
Accrued expenses	761	(1,161)
Net cash used in operating activities	<u>(4,030)</u>	<u>(9,604)</u>
Cash flows from investing activities:		
Purchases of property and equipment	(566)	(161)
Change in restricted cash	(165)	—
Net cash used in investing activities	<u>(731)</u>	<u>(161)</u>
Cash flows from financing activities:		
Proceeds from issuance of redeemable convertible preferred stock	6,250	—
Payments of initial public offering costs	—	(166)
Payments of redeemable convertible preferred stock issuance costs	(36)	(9)
Net cash provided by (used in) financing activities	<u>6,214</u>	<u>(175)</u>
Net increase (decrease) in cash and cash equivalents	1,453	(9,940)
Cash and cash equivalents at beginning of period	4,513	51,402
Cash and cash equivalents at end of period	<u>\$ 5,966</u>	<u>\$ 41,462</u>
Supplemental disclosure of non-cash investing and financing activities:		
Purchase of property and equipment included in accounts payable	\$ 704	\$ 85
Deferred offering and redeemable convertible preferred share issuance costs included in accounts payable or accrued expenses	\$ —	\$ 1,221
Cumulative dividends on Series A redeemable convertible preferred stock	\$ 354	\$ —

The accompanying notes are an integral part of these financial statements.

MAGENTA THERAPEUTICS, INC.

NOTES TO FINANCIAL STATEMENTS

(Unaudited)

1. Nature of the Business and Basis of Presentation

Magenta Therapeutics, Inc. (the “Company”) is a clinical-stage biopharmaceutical company developing novel medicines to bring the curative power of bone marrow transplant to more patients. The Company was incorporated under the laws of the State of Delaware in June 2015 as HSCTCo Therapeutics, Inc. In February 2016, the Company changed its name to Magenta Therapeutics, Inc.

The Company is subject to risks and uncertainties common to early-stage companies in the biotechnology industry, including, but not limited to, development by competitors of new technological innovations, dependence on key personnel, protection of proprietary technology, compliance with government regulations and the ability to secure additional capital to fund operations. Product candidates currently under development will require significant additional research and development efforts, including extensive preclinical and clinical testing and regulatory approval prior to commercialization. These efforts require significant amounts of additional capital, adequate personnel and infrastructure and extensive compliance-reporting capabilities. Even if the Company’s drug development efforts are successful, it is uncertain when, if ever, the Company will realize significant revenue from product sales.

The financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”).

2. Summary of Significant Accounting Policies

Unaudited Interim Financial Information

The accompanying balance sheet as of March 31, 2018 and the statements of operations and comprehensive loss and of cash flows for the three months ended March 31, 2017 and 2018 are unaudited. The unaudited interim financial statements have been prepared on the same basis as the audited annual financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary for the fair statement of the Company’s financial position as of March 31, 2018 and the results of its operations and its cash flows for the three months ended March 31, 2017 and 2018. The financial data and other information disclosed in these notes related to the three months ended March 31, 2017 and 2018 are also unaudited. The results for the three months ended March 31, 2018 are not necessarily indicative of results to be expected for the year ending December 31, 2018, any other interim periods, or any future year or period. The balance sheet as of December 31, 2017 included herein was derived from the audited financial statements as of that date. These financial statements should be read in conjunction with the Company’s audited financial statements included elsewhere in this prospectus.

Unaudited Pro Forma Information

The accompanying unaudited pro forma balance sheet as of March 31, 2018 has been prepared to give effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock into 49,178,527 shares of common stock as if the Company’s proposed initial public offering had occurred on March 31, 2018.

In the accompanying statements of operations and comprehensive loss, the unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the three months ended March 31, 2018 has been prepared to give effect to the automatic conversion of all outstanding shares of redeemable convertible preferred stock as if the Company’s proposed initial public offering had occurred on the later of January 1, 2018 or the issuance date of the redeemable convertible preferred stock.

Deferred Offering Costs

The Company capitalizes certain legal, professional accounting and other third-party fees that are directly associated with in-process equity financings as deferred offering costs until such financings are consummated. After consummation of the equity financing, these costs are recorded in stockholders' deficit as a reduction of additional paid-in capital generated as a result of the offering. Should the in-process equity financing be abandoned, the deferred offering costs will be expensed immediately as a charge to operating expenses in the statements of operations and comprehensive loss. As of December 31, 2017, the Company had not recorded any deferred offering costs. As of March 31, 2018, the Company recorded \$1.4 million of deferred offering costs in contemplation of a probable 2018 equity financing.

Cash Equivalents

The Company considers all highly liquid investments with original maturities of three months or less at the date of purchase to be cash equivalents.

Fair Value Measurements

Certain assets and liabilities are carried at fair value under GAAP. Fair value is defined as the exchange price that would be received for an asset or paid to transfer a liability (an exit price) in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date. Valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. Financial assets and liabilities carried at fair value are to be classified and disclosed in one of the following three levels of the fair value hierarchy, of which the first two are considered observable and the last is considered unobservable:

- Level 1—Quoted prices in active markets for identical assets or liabilities.
- Level 2—Observable inputs (other than Level 1 quoted prices), such as quoted prices in active markets for similar assets or liabilities, quoted prices in markets that are not active for identical or similar assets or liabilities, or other inputs that are observable or can be corroborated by observable market data.
- Level 3—Unobservable inputs that are supported by little or no market activity and that are significant to determining the fair value of the assets or liabilities, including pricing models, discounted cash flow methodologies and similar techniques.

The Company's cash equivalents are carried at fair value, determined according to the fair value hierarchy described above (see Note 3). The carrying values of the Company's other receivables, accounts payable and accrued expenses approximate their fair values due to the short-term nature of these assets and liabilities.

Net Loss per Share

The Company follows the two-class method when computing net income (loss) per share, as the Company has issued shares that meet the definition of participating securities. The two-class method determines net income (loss) per share for each class of common and participating securities according to dividends declared or accumulated and participation rights in undistributed earnings. The two-class method requires income available to common stockholders for the period to be allocated between common and participating securities based upon their respective rights to receive dividends as if all income for the period had been distributed.

Basic net income (loss) per share attributable to common stockholders is computed by dividing the net income (loss) attributable to common stockholders by the weighted average number of shares of common stock outstanding for the period. Diluted net income (loss) attributable to common stockholders is computed by adjusting income (loss) attributable to common stockholders to reallocate undistributed earnings based on the potential impact of dilutive securities, including outstanding stock options and unvested restricted common stock.

Diluted net income (loss) per share attributable to common stockholders is computed by dividing the diluted net income (loss) attributable to common stockholders by the weighted average number of common shares outstanding for the period, including potential dilutive common shares assuming the dilutive effect of outstanding stock options and unvested restricted common stock.

The Company's outstanding redeemable convertible preferred stock contractually entitle the holders of such shares to participate in distributions but contractually does not require the holders of such shares to participate in losses of the Company. Similarly, restricted stock awards granted by the Company entitle the holder of such awards to dividends declared or paid by the board of directors, regardless of whether such awards are unvested, as if such shares were outstanding common shares at the time of the dividend. However, the unvested restricted stock awards are not entitled to share in the residual net assets (deficit) of the Company. Accordingly, in periods in which the Company reports a net loss attributable to common stockholders, diluted net loss per share attributable to common stockholders is the same as basic net loss per share attributable to common stockholders, since dilutive common shares are not assumed to have been issued if their effect is anti-dilutive.

The Company reported a net loss attributable to common stockholders for the three months ended March 31, 2017 and 2018.

Recently Adopted Accounting Pronouncements

In May 2017, the FASB issued ASU No. 2017-09, Compensation—Stock Compensation (Topic 718): Scope of Modification Accounting ("ASU 2017-09"), which clarifies when to account for a change to the terms or conditions of a share-based payment award as a modification. Under the new guidance, modification accounting is required only if the fair value, the vesting conditions, or the classification of the award (as equity or liability) changes as a result of the change in terms or conditions. For public and non-public entities, the standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. Early adoption is permitted. The adoption of ASU 2017-09 did not have an impact on the Company's financial position, results of operations or cash flows.

Recently Issued Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, *Leases* ("ASU 2016-02"). ASU 2016-02 will require lessees to recognize most leases on their balance sheet as a right-of-use asset and a lease liability. Leases will be classified as either operating or finance, and classification will be based on criteria similar to current lease accounting, but without explicit bright lines. For public entities, the guidance is effective for annual reporting periods beginning after December 15, 2018 and for interim periods within those fiscal years. For non-public entities, the guidance is effective for annual reporting periods beginning after December 15, 2019. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2016-02 will have on its financial statements.

In August 2016, the FASB issued ASU No. 2016-15, *Statement of Cash Flows: Classification of Certain Cash Receipts and Cash Payments* ("ASU 2016-15"), to address diversity in practice in how certain cash receipts and cash payments are presented and classified in the statement of cash flows. For public entities, the standard is effective for annual periods beginning after December 15, 2017, including interim periods within those fiscal years. For non-public entities, the standard is effective for annual periods beginning after December 15, 2018. Early adoption is permitted for all entities. The Company is currently planning to adopt ASU 2016-15 by January 1, 2019, in accordance with the non-public company requirements. The Company is currently evaluating the impact that the adoption of ASU 2016-15 will have on its financial statements.

In November 2016, the FASB issued ASU No. 2016-18, *Statement of Cash Flows (Topic 230)* ("ASU 2016-18"), which requires that amounts generally described as restricted cash and restricted cash equivalents should be included with cash and cash equivalents when reconciling the beginning-of-period and end-of-period total amounts shown on the statement of cash flows. For public entities, ASU 2016-18 is effective for fiscal years

[Table of Contents](#)

beginning after December 15, 2017 and interim periods within those fiscal years. For non-public entities, the standard is effective for fiscal years beginning after December 15, 2018. Early adoption is permitted for all entities. The Company is currently planning to adopt ASU 2016-18 by January 1, 2019, in accordance with the non-public company requirements. The Company is currently evaluating the impact that the adoption of ASU 2016-18 will have on its financial statements.

In July 2017, the FASB issued ASU No. 2017-11, *Earnings Per Share (Topic 260), Distinguishing Liabilities from Equity (Topic 480), Derivatives and Hedging (Topic 815) I. Accounting for Certain Financial Instruments with Down Round Features II. Replacement of the Indefinite Deferral for Mandatorily Redeemable Financial Instruments of Certain Nonpublic Entities and Certain Mandatorily Redeemable Noncontrolling Interests with a Scope Exception* ("ASU 2017-11"). Part I applies to entities that issue financial instruments such as warrants, convertible debt or convertible preferred stock that contain down-round features. Part II replaces the indefinite deferral for certain mandatorily redeemable noncontrolling interests and mandatorily redeemable financial instruments of nonpublic entities contained within ASC Topic 480 with a scope exception and does not impact the accounting for these mandatorily redeemable instruments. For public entities, ASU 2017-11 is required to be adopted for annual periods beginning after December 15, 2018, including interim periods within those fiscal years. For non-public entities, ASU 2017-11 is effective for annual periods beginning after December 15, 2019. Early adoption is permitted for all entities. The Company is currently evaluating the impact that the adoption of ASU 2017-11 will have on its financial statements.

3. Fair Value of Financial Assets

The following tables present information about the Company's financial assets measured at fair value on a recurring basis and indicate the level of the fair value hierarchy utilized to determine such fair values (in thousands):

	Fair Value Measurements at December 31, 2017 Using			Total
	Level 1	Level 2	Level 3	
Cash equivalents:				
Money market funds	\$51,147	\$ —	\$ —	\$51,147
Total	<u>\$51,147</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$51,147</u>

	Fair Value Measurements at March 31, 2018 Using			Total
	Level 1	Level 2	Level 3	
Cash equivalents:				
Money market funds	\$41,404	\$ —	\$ —	\$41,404
Total	<u>\$41,404</u>	<u>\$ —</u>	<u>\$ —</u>	<u>\$41,404</u>

During the three months ended March 31, 2018, there were no transfers between Level 1, Level 2 and Level 3.

[Table of Contents](#)**4. Accrued Expenses**

Accrued expenses consisted of the following (in thousands):

	December 31, 2017	March 31, 2018
Accrued external research and development expenses	\$ 1,531	\$ 1,626
Accrued professional fees	963	1,333
Accrued payroll and related expenses	1,330	589
Accrued other	151	214
	<u>\$ 3,975</u>	<u>\$ 3,762</u>

5. Redeemable Convertible Preferred Stock

As of each balance sheet date, the Preferred Stock consisted of the following (in thousands, except share amounts):

	December 31, 2017				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred Stock	35,663,974	35,663,974	\$39,939	\$ 35,664	35,663,974
Series B Preferred Stock	13,514,553	13,514,553	52,500	52,500	13,514,553
	<u>49,178,527</u>	<u>49,178,527</u>	<u>\$92,439</u>	<u>\$ 88,164</u>	<u>49,178,527</u>
	March 31, 2018				
	Preferred Stock Authorized	Preferred Stock Issued and Outstanding	Carrying Value	Liquidation Preference	Common Stock Issuable Upon Conversion
Series A Preferred Stock	35,663,974	35,663,974	\$39,939	\$ 35,664	35,663,974
Series B Preferred Stock	13,514,553	13,514,553	52,500	52,500	13,514,553
	<u>49,178,527</u>	<u>49,178,527</u>	<u>\$92,439</u>	<u>\$ 88,164</u>	<u>49,178,527</u>

6. Stock-Based Compensation**2016 Stock Option and Grant Plan**

The Company grants stock-based awards under its 2016 Stock Option and Grant Plan, (the "2016 Plan"). The total number of shares of common stock that may be issued under the 2016 Plan was 10,377,440 shares as of March 31, 2018, of which 2,594,587 shares remained available for future grant as of March 31, 2018.

Common Stock Option Valuation

The assumptions that the Company used to determine the fair value of options granted to employees, non-employees and directors were as follows, presented on a weighted average basis:

	Three Months Ended March 31, 2018
Risk-free interest rate	2.6%
Expected term (in years)	6.1
Expected volatility	77.8%
Expected dividend yield	0%

There were no stock options granted during the three months ended March 31, 2017.

[Table of Contents](#)

Common Stock Option Activity

The following table summarizes the Company's option activity since December 31, 2017:

	Number of Shares	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding as of December 31, 2017	1,613,500	\$ 1.87	9.8	\$ 1,791
Granted	1,969,500	2.98		
Exercised	—	—		
Forfeited	—	—		
Outstanding as of March 31, 2018	<u>3,583,000</u>	\$ 2.48	9.7	\$ 4,263
Options vested and expected to vest as of March 31, 2018	<u>3,583,000</u>	\$ 2.48	9.7	\$ 4,263
Options exercisable as of March 31, 2018	<u>42,187</u>	\$ 1.87	9.5	\$ 76

The weighted average grant-date fair value per share of options granted during the three months ended March 31, 2018 was \$2.05.

As of March 31, 2018, there were 159,688 of unvested options held by non-employees.

Restricted Stock Activity

The table below summarizes the Company's restricted stock activity for grants since December 31, 2017:

	Number of Shares	Weighted Average Grant Date Fair Value
Outstanding as of December 31, 2017	5,445,276	\$ 0.48
Vested	(695,229)	0.63
Forfeited	(26,000)	0.32
Outstanding as of March 31, 2018	<u>4,724,047</u>	\$ 0.46

The total fair value of restricted stock vested during the three months ended March 31, 2018 was \$2.3 million.

As of March 31, 2018, there were 1,421,358 of unvested shares of restricted stock held by non-employees.

Stock-Based Compensation

Stock-based compensation expense was classified in the statements of operations and comprehensive loss as follows (in thousands):

	Three Months Ended March 31,	
	2017	2018
Research and development expenses	\$ 224	\$ 891
General and administrative expenses	90	534
	<u>\$ 314</u>	<u>\$ 1,425</u>

[Table of Contents](#)

As of March 31, 2018, total unrecognized compensation cost related to the unvested stock-based awards was \$12.6 million, which is expected to be recognized over a weighted average period of 2.7 years.

7. Net Loss per Share and Unaudited Pro Forma Net Loss per Share

Net Loss per Share

Basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Three Months Ended	
	March 31,	
	2017	2018
Numerator:		
Net loss	\$ (4,811)	\$ (11,161)
Cumulative dividends on redeemable convertible preferred stock	(354)	—
Net loss attributable to common stockholders	<u>\$ (5,165)</u>	<u>\$ (11,161)</u>
Denominator:		
Weighted average common shares outstanding—basic and diluted	3,716,695	6,373,006
Net loss per share attributable to common stockholders—basic and diluted	<u>\$ (1.39)</u>	<u>\$ (1.75)</u>

Common Stock Equivalents

The following common stock equivalents presented based on amounts outstanding at each period end, have been excluded from the calculation of diluted net loss per share because including them would have had an anti-dilutive impact:

	March 31,	
	2017	2018
Redeemable convertible preferred stock (as converted to common stock)	17,718,974	49,178,527
Stock options to purchase common stock	—	3,583,000
Unvested restricted common stock	9,093,297	4,724,047
	<u>26,812,271</u>	<u>57,485,574</u>

Unaudited Pro Forma Net Loss per Share

The unaudited pro forma basic and diluted weighted average common shares outstanding used in the calculation of unaudited pro forma basic and diluted net loss per share attributable to common stockholders for the three months ended March 31, 2018 gives effect to the automatic conversion upon the closing of the proposed initial public offering of all outstanding shares of redeemable convertible preferred stock as of March 31, 2018 into 49,178,527 shares of common stock as if the conversion had occurred on the later of January 1, 2018 or the issuance date of the redeemable convertible preferred stock.

[Table of Contents](#)

Unaudited pro forma basic and diluted net loss per share attributable to common stockholders was calculated as follows (in thousands, except share and per share amounts):

	Three Months Ended March 31, 2018 (unaudited)
Numerator:	
Net loss attributable to common stockholders	\$ (11,161)
Pro forma net loss attributable to common stockholders	<u>\$ (11,161)</u>
Denominator:	
Weighted average common shares outstanding—basic and diluted	6,373,006
Pro forma adjustment to reflect assumed automatic conversion of redeemable convertible preferred shares upon the closing of the proposed initial public offering	<u>49,178,527</u>
Pro forma weighted average common shares outstanding—basic and diluted	<u>55,551,533</u>
Pro forma net loss per share attributable to common shareholders—basic and diluted	<u>\$ (0.20)</u>

8. Commitments and Contingencies

Leases

The Company entered into an eighteen-month sublease for office space in Cambridge, Massachusetts that began in February 2017 and expires in August 2018. The Company is required to maintain a cash balance of \$0.2 million to secure a letter of credit associated with the lease. This amount was classified as restricted cash in the balance sheet at March 31, 2018. Prior to the current lease, the Company leased office space in Cambridge, Massachusetts on a month-to-month basis for which the Company was required to maintain a cash balance of less than \$0.1 million to secure a letter of credit for the benefit of the landlord. This amount was classified as restricted cash in the balance sheet at December 31, 2016.

The Company recorded rent expense of \$0.2 million and \$0.3 million during the three months ended March 31, 2017 and 2018, respectively.

As of March 31, 2018, the Company has future minimum lease payments due under the operating lease of \$0.4 million to be paid in 2018.

Collaboration Agreement

In March 2018, the Company entered into a collaboration agreement with Heidelberg Pharma Research GmbH, (“HDPR”) whereby the parties agreed to combine the Company’s stem cell platform with proprietary antibodies across up to four exclusive targets with HDPR’s proprietary Antibody Targeted Amanitin Conjugates platform. Under the agreement, the Company may pay upfront technology access fees, research exclusivity fees and payment for research support. Additionally, upon the exercise of certain license rights, the Company may be obligated to pay HDPR development, regulatory and commercial milestone payments of up to \$83.5 million per target as well as royalties on net sales of products licensed under the agreement. During the three months ended March 31, 2018, the Company recorded \$0.7 million to research and development expense related to this agreement for upfront technology access fees, research exclusivity fees and research support.

Intellectual Property Licenses

In November 2016, the Company entered into a license agreement with the President and Fellows of Harvard College (“Harvard”) for an exclusive, worldwide, royalty-bearing license for certain technologies related

to conditioning and mobilization. In consideration for these rights the Company paid Harvard an upfront fee of \$0.1 million and reimbursed Harvard \$0.3 million for costs incurred by Harvard related to the patented technology, which amounts were recorded as research and development expense during the year ended December 31, 2016. The Company also issued 995,000 shares of common stock in connection with the license agreement. The fair value of the shares of \$0.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2016. The Company is obligated to pay Harvard maintenance fees of less than \$0.1 million annually through 2019 and \$0.1 million annually thereafter and to reimburse qualified expenses related to the patents. The Company is also obligated to pay milestone payments of up to \$7.4 million for the first two licensed products upon the achievement of certain development and regulatory milestones and to pay royalties on a product-by-product and country-by-country basis on net sales of products licensed under the agreement.

In April 2017, the Company entered into a license agreement with Novartis to use and develop certain patent rights (the “Novartis License”). Under the Novartis License the Company was granted an exclusive, worldwide, sublicensable license to research, develop and commercialize certain licensed products that contain Novartis compounds for the expansion of cord blood derived non-gene-edited/-modified hematopoietic stem cells. In consideration for these rights, the Company issued 2,500,000 shares of Series A redeemable convertible preferred stock and 643,550 shares of Series B redeemable convertible preferred stock to Novartis. The total fair value of the shares of \$9.3 million as of the issuance date was recorded as research and development expense during the year ended December 31, 2017. The Company is obligated to make payments of up to \$177.0 million upon the achievement of specified clinical and regulatory milestones and up to \$125.0 million upon the achievement of specified commercial milestones and to pay tiered royalties, on a product-by-product and country-by-country basis, up to a maximum of 20% on net sales of products licensed under the agreement.

The Company has agreements with third parties in the normal course of business, under which it can license certain developed technologies. If the Company exercises its rights to license the respective technologies it may be subject to additional fees and milestone payments. As of March 31, 2018, the Company has not exercised its rights to license such technologies.

Indemnification Agreements

In the ordinary course of business, the Company may provide indemnification of varying scope and terms to vendors, lessors, business partners and other parties with respect to certain matters including, but not limited to, losses arising out of breach of such agreements or from intellectual property infringement claims made by third parties. In addition, the Company has entered into indemnification agreements with members of its board of directors and senior management that will require the Company, among other things, to indemnify them against certain liabilities that may arise by reason of their status or service as directors or officers. The maximum potential amount of future payments the Company could be required to make under these indemnification agreements is, in many cases, unlimited. To date, the Company has not incurred any material costs as a result of such indemnifications. The Company is not aware of any claims under indemnification arrangements, and it has not accrued any liabilities related to such obligations in its financial statements as of December 31, 2017 or March 31, 2018.

Legal Proceedings

The Company is not currently a party to any material legal proceedings. At each reporting date, the Company evaluates whether or not a potential loss amount or a potential range of loss is probable and reasonably estimable under the provisions of the authoritative guidance that addresses accounting for contingencies. The Company expenses the costs related to its legal proceedings as they are incurred.

9. 401(k) Savings Plan

The Company has a 401(k) available for participating employees who meet certain eligibility requirements. Eligible employees may defer a portion of their salary as defined by the plan. Company contributions to the plan may be made at the discretion of the Board of Directors of the Company. To date, the Company has not made any contributions to the plan.

10. Income Taxes

The Company did not provide for any income taxes in the three months ended March 31, 2017 and 2018. The Company had net deferred tax assets and liabilities of \$12,466 million at December 31, 2017. The Company has provided a valuation allowance for the full amount of its net deferred tax assets and liabilities because, at each of December 31, 2017 and March 31, 2018, it was more likely than not that any future benefit from deductible temporary differences and net operating loss and tax credit carryforwards would not be realized.

The Company has not recorded any amounts for unrecognized tax benefits as of December 31, 2017 or March 31, 2018. As of December 31, 2017 and March 31, 2018, the Company had no accrued interest or tax penalties recorded. The Company's income tax return reporting periods since 2015 are open to income tax audit examination by the federal and state tax authorities.

11. Related Parties

Atlas Venture Life Science Advisors LLC and Third Rock Ventures LLC

During the three months ended March 31, 2017, the Company received consulting, advisory and related services from Atlas Venture Life Science Advisors LLC and Third Rock Ventures LLC, holders, together with their affiliates, of more than 5% of the redeemable convertible preferred stock. For the three months ended March 31, 2017, the Company recorded \$0.1 million of general and administrative expenses for management and advisory services and other related services provided by these investors, of which \$0.1 million was paid during the three months ended March 31, 2017. There were no services provided during the three months ended March 31, 2018. There were no amounts owed as of December 31, 2017 or March 31, 2018.

Be The Match BioTherapies, LLC

Effective March 2018, one of the members of the Company's board of directors is the President of Be The Match BioTherapies, LLC. The Company has a collaboration agreement with Be The Match BioTherapies, LLC and a research agreement with an affiliated organization, Center for International Blood and Marrow Transplant Research. For the three months ended March 31, 2018, the Company recorded \$0.2 million to research and development expense and less than \$0.1 million to general and administrative expenses and made payments of \$0.2 million for the three months ended March 31, 2018 related to these agreements. As of March 31, 2018, amounts on the balance sheet related to these agreements was \$0.1 million included in accounts payable and \$0.1 million included in prepaid expenses.

In April 2018, the Company sold 246,781 shares of Series C Preferred Stock to Be The Match Bio Therapies, LLC for \$1.1 million (see Note 12).

12. Subsequent Events

For its interim financial statements as of March 31, 2018 and for the three months then ended, the Company evaluated subsequent events through May 7, 2018, the date on which those financial statements were issued.

Sale of Shares of Series C Redeemable Convertible Preferred Shares

In April 2018, the Company entered into a Series C preferred stock purchase agreement, pursuant to which the Company sold 11,223,102 shares of Series C redeemable convertible preferred stock (the "Series C Preferred

[Table of Contents](#)

Stock”) at a price of \$4.66 per share for total gross proceeds of \$52.3 million. In connection with the Series C Preferred Stock purchase agreement, the Company’s certificate of incorporation was amended and restated to authorize the Company to issue 11,226,000 shares of Series C Preferred Stock and to increase the number of common stock authorized from 70,000,000 to 85,000,000 shares. In addition, the redemption date of the Preferred Stock was changed from any time on or after April 21, 2022, to the fifth anniversary of the Series C Original Issue Date, or April 2, 2023.

2016 Equity Plan

In April 2018, the 2016 Plan was amended to increase the number of shares reserved for issuance under the 2016 Plan by 4,870,417 shares.

Shares



Common Stock

Preliminary Prospectus

J.P. Morgan

Goldman Sachs & Co. LLC
Wedbush PacGrow

Cowen

PART II**INFORMATION NOT REQUIRED IN PROSPECTUS****Item 13. Other Expenses of Issuance and Distribution**

The following table sets forth all expenses, other than the underwriting discounts and commissions, payable by Magenta Therapeutics, Inc. (the “Company” or the “Registrant”) in connection with the sale of the common stock being registered. All the amounts shown are estimates except the SEC registration fee, the FINRA filing fee and the NASDAQ initial listing fee.

	<u>Amount</u>
SEC registration fee	\$ *
FINRA filing fee	*
NASDAQ initial listing fee	*
Blue sky qualification fees and expenses	*
Printing and engraving expenses	*
Legal fees and expenses	*
Accounting fees and expenses	*
Transfer agent and registrar fees	*
Miscellaneous	*
Total	\$ *

* To be filed by amendment.

Item 14. Indemnification of Directors and Officers

Section 145 of the Delaware General Corporation Law permits a corporation to include in its charter documents, and in agreements between the corporation and its directors and officers, provisions expanding the scope of indemnification beyond that specifically provided by the current law.

Section 145(a) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding, whether civil, criminal, administrative or investigative (other than an action by or in the right of the corporation), because he or she is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys’ fees), judgments, fines and amounts paid in settlement actually and reasonably incurred by the person in connection with such action, suit or proceeding, if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation and, with respect to any criminal action or proceeding, had no reasonable cause to believe his or her conduct was unlawful.

Section 145(b) of the Delaware General Corporation Law provides, in general, that a corporation may indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action or suit by or in the right of the corporation to procure a judgment in its favor because the person is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise, against expenses (including attorneys’ fees) actually and reasonably incurred by the person in connection with the defense or settlement of such action or suit if he or she acted in good faith and in a manner he or she reasonably believed to be in or not opposed to the best interests of the corporation, except that no indemnification shall be made with respect to any claim, issue or matter as to which he or she shall have been adjudged to be liable to the corporation unless and only to the extent that the Court of Chancery or other adjudicating court determines that, despite the adjudication of liability but in view of all of the circumstances of the case, he or she

[Table of Contents](#)

is fairly and reasonably entitled to indemnity for such expenses which the Court of Chancery or other adjudicating court shall deem proper.

Section 145(g) of the Delaware General Corporation Law provides, in general, that a corporation may purchase and maintain insurance on behalf of any person who is or was a director, officer, employee or agent of the corporation, or is or was serving at the request of the corporation as a director, officer, employee or agent of another corporation, partnership, joint venture, trust or other enterprise against any liability asserted against such person and incurred by such person in any such capacity, or arising out of his or her status as such, whether or not the corporation would have the power to indemnify the person against such liability under Section 145 of the Delaware General Corporation Law.

The Company's amended and restated certificate of incorporation, which will become effective upon completion of the offering, provides for the indemnification of directors to the fullest extent permissible under Delaware law.

The Company's amended and restated bylaws, which will become effective upon completion of the offering, provide for the indemnification of officers, directors and third parties acting on the Company's behalf if such persons act in good faith and in a manner reasonably believed to be in and not opposed to the Company's best interest, and, with respect to any criminal action or proceeding, such indemnified party had no reason to believe his or her conduct was unlawful.

The Company is entering into indemnification agreements with each of its directors and executive officers, in addition to the indemnification provisions provided for in its charter documents, and the Company intends to enter into indemnification agreements with any new directors and executive officers in the future. These agreements will provide that we will indemnify each of our directors and executive officers, and such entities to the fullest extent permitted by law.

The underwriting agreement (to be filed as Exhibit 1.1 hereto) will provide for indemnification by the underwriters of the Company, and its executive officers and directors, and indemnification of the underwriters by the Company for certain liabilities, including liabilities arising under the Securities Act of 1933, as amended, in connection with matters specifically provided in writing by the underwriters for inclusion in the registration statement.

The Company intends to purchase and maintain insurance on behalf of any person who is or was a director or officer against any loss arising from any claim asserted against him or her and incurred by him or her in that capacity, subject to certain exclusions and limits of the amount of coverage.

Item 15. Recent Sales of Unregistered Securities

In the three years preceding the filing of this registration statement, we have issued the following securities that were not registered under the Securities Act:

Issuances of Capital Stock

In February 2016, we issued and sold an aggregate of 5,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$5.00 to Third Rock Ventures III, L.P., or TRV III, and 5,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$5.00 to Atlas Venture Fund X, L.P., or Atlas X.

In November 2016, we issued and sold an aggregate of 245,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$245.00 to TRV III and 245,000 shares of our common stock at a purchase price of \$0.001 per share, for an aggregate purchase price of \$245.00 to Atlas X.

Table of Contents

In November and December 2016, we issued and sold an aggregate of 11,310,853 shares of our restricted common stock at \$0.001 per share to certain of our directors and employees. In March 2017, we issued and sold an aggregate of 565,000 shares of our restricted common stock at \$0.01 per share to certain of our employees.

In November 2016, with a subsequent closing in April 2017, we issued and sold an aggregate of 33,163,974 shares of Series A preferred stock at a purchase price of \$1.00 per share. Certain investors holding convertible notes issued in 2015 and 2016 used such notes to purchase our Series A preferred stock. Each share of our Series A preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering.

In November 2016, in connection with the Harvard License, we granted 995,000 shares of common stock to Harvard and its affiliates Children's Medical Center Corporation and The General Hospital Corporation at a purchase price of \$0.001 per share.

In April 2017, with a subsequent closing in June 2017, we issued and sold an aggregate of 12,871,003 shares of Series B preferred stock at a purchase price of \$3.8847 per share. Each share of our Series B preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering.

In April 2017, in connection with the Novartis License, we issued 2,500,000 shares of our Series A preferred stock and 643,550 shares of our Series B preferred stock to Novartis as partial consideration of Novartis' obligations under the Novartis License.

In April 2018, we issued and sold an aggregate of 11,223,102 shares of Series C preferred stock at a purchase price of \$4.66 per share. Each share of our Series C preferred stock will convert automatically into one share of our common stock immediately prior to the completion of this offering.

No underwriters were used in the foregoing transactions. All sales of securities described above were made in reliance upon the exemption from registration provided by Section 4(a)(2) of the Securities Act (and/or Regulation D promulgated thereunder) for transactions by an issuer not involving a public offering. All of the foregoing securities are deemed restricted securities for the purposes of the Securities Act.

Grants of Stock Options and Restricted Stock under the 2016 Plan.

From September 28, 2017 through April 30, 2018, we have granted stock options to purchase an aggregate of 4,770,560 shares of our common stock, with exercise prices ranging from \$1.87 to \$3.67 per share, to employees, directors and consultants pursuant to the 2016 Plan. From November 1, 2016 through March 31, 2017, we have granted an aggregate of 4,575,853 shares of restricted stock under the 2016 Plan. The issuances of these securities were exempt either pursuant to Rule 701, as a transaction pursuant to a compensatory benefit plan, or pursuant to Section 4(a)(2), as a transaction by an issuer not involving a public offering.

Item 16. Exhibits and Financial Statement Schedules

(a) Exhibits.

The exhibits to the registration statement are listed in the Exhibit Index to this registration statement and are incorporated herein by reference.

(b) Financial Statement Schedules.

None.

Item 17. Undertakings

Insofar as indemnification for liabilities arising under the Securities Act of 1933, as amended, may be permitted to directors, officers and controlling persons of the Registrant pursuant to the foregoing provisions, or otherwise, the Registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act and is, therefore, unenforceable. In the

Table of Contents

event that a claim for indemnification against such liabilities (other than the payment by the Registrant of expenses incurred or paid by a director, officer or controlling person of the Registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the Registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

The undersigned Registrant hereby undertakes that:

(a) The undersigned Registrant will provide to the underwriters at the closing specified in the underwriting agreement certificates in such denominations and registered in such names as required by the underwriters to permit prompt delivery to each purchaser.

(b) For purposes of determining any liability under the Securities Act, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the Registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

(c) For the purpose of determining any liability under the Securities Act, each post-effective amendment that contains a form of prospectus shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof.

EXHIBIT INDEX

Exhibit No.	Description
1.1*	Form of Underwriting Agreement
3.1	Third Amended and Restated Certificate of Incorporation of the Registrant, as currently in effect
3.2*	Form of Amended and Restated Certificate of Incorporation of the Registrant, to be in effect upon completion of the offering
3.3**	Bylaws of the Registrant and the amendments thereto, as currently in effect
3.4*	Form of Amended and Restated Bylaws of the Registrant, to be in effect upon completion of the offering
4.1*	Specimen Common Stock Certificate
4.2	Second Amended and Restated Investors' Rights Agreement by and among the Registrant and certain of its stockholders dated April 2, 2018
5.1*	Opinion of Goodwin Procter LLP
10.1#	2016 Stock Option and Grant Plan, as amended, and forms of award agreements thereunder
10.2#*	2018 Stock Option and Incentive Plan and forms of award agreements thereunder
10.3#*	Senior Executive Cash Incentive Bonus Plan
10.4#*	Form of Employment Agreement
10.5#*	Form of Indemnification Agreement
10.6†**	License Agreement by and between President and Fellows of Harvard College and the Registrant, dated as of November 2, 2016

Table of Contents

10.7†**	License Agreement by and between Novartis International Pharmaceutical Ltd. and the Registrant, dated as of April 3, 2017
10.8†**	Collaboration Agreement by and between Be The Match BioTherapies and the Registrant, dated as of November 10, 2017
10.9†**	Clinical Trial Agreement by and between Regents of the University of Minnesota and the Registrant, dated as of January 22, 2018
10.10†**	Master Development and Manufacturing Agreement by and between Bachem Americas, Inc. and the Registrant, dated as of February 13, 2018
10.11†**	Exclusive Research, Development Option and License Agreement by and between Heidelberg Pharma Research GmbH and the Registrant, dated as of March 1, 2018
10.12**	Sublease Agreement, dated as of September 15, 2016, by and between the Registrant and Surface Oncology, Inc.
23.1*	Consent of KPMG LLP, Independent Registered Public Accounting Firm
23.2*	Consent of Goodwin Procter LLP (included in Exhibit 5.1)
24.1	Power of Attorney (included on signature page)

* To be filed by amendment.

** Previously filed.

† Application has been made to the Securities and Exchange Commission for confidential treatment of certain provisions. Omitted material for which confidential treatment has been requested has been filed separately with the Securities and Exchange Commission.

Represents management compensation plan, contract or arrangement.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Massachusetts, on the day of , 2018.

MAGENTA THERAPEUTICS, INC.

By: _____
Jason Gardner, D.Phil.
President, Chief Executive Officer and Director

POWER OF ATTORNEY

Each person whose individual signature appears below hereby authorizes and appoints Jason Gardner and Zoran Zdraveski and each of them, with full power of substitution and resubstitution and full power to act without the other, as his or her true and lawful attorney in fact and agent to act in his or her name, place and stead and to execute in the name and on behalf of each person, individually and in each capacity stated below, and to file any and all amendments to this Registration Statement, including any and all post effective amendments and amendments thereto, and any registration statement relating to the same offering as this Registration Statement that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933, as amended, and to file the same, with all exhibits thereto, and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys in fact and agents, and each of them, full power and authority to do and perform each and every act and thing, ratifying and confirming all that said attorneys in fact and agents or any of them or their or his substitute or substitutes may lawfully do or cause to be done by virtue thereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities and on the date indicated.

Signature	Title	Date
_____ JASON GARDNER, D.Phil.	President, Chief Executive Officer and Director (Principal Executive Officer)	
_____ CINDY DRISCOLL	Treasurer, Vice President, Finance (Principal Financial Officer and Principal Accounting Officer)	
_____ JEFFREY ALBERS	Director	
_____ MICHAEL W. BONNEY	Director	
_____ BRUCE BOOTH, D.Phil.	Director	
_____ ALEXIS A. BORISY	Director	
_____ BLAKE BYERS, Ph.D.	Director	
_____ THOMAS O. DANIEL, M.D.	Director	
_____ AMY L. RONNEBERG	Director	
_____ DAVID T. SCADDEN, M.D.	Director	

THIRD AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
MAGENTA THERAPEUTICS, INC.

(Pursuant to Sections 242 and 245 of the
General Corporation Law of the State of Delaware)

Magenta Therapeutics, Inc., a corporation organized and existing under and by virtue of the provisions of the General Corporation Law of the State of Delaware (the “**General Corporation Law**”),

DOES HEREBY CERTIFY:

1. That the name of this corporation is Magenta Therapeutics, Inc., and that this corporation was originally incorporated pursuant to the General Corporation Law on June 17, 2015 under the name HSCTCo Therapeutics, Inc. The name of this corporation was changed on February 16, 2016 to Magenta Therapeutics, Inc. The corporation’s certificate of incorporation was amended by that certain certificate of amendment dated as of February 16, 2016, was further amended by that certain certificate of amendment dated as of November 1, 2016, was further amended by that certain Amended and Restated Certificate of Incorporation dated as of November 10, 2016 and was further amended by that certain Second Amended and Restated Certificate of Incorporation dated as of April 21, 2017.

2. That the Board of Directors duly adopted resolutions proposing to amend and restate the Second Amended and Restated Certificate of Incorporation of this corporation, as amended, declaring said amendment and restatement to be advisable and in the best interests of this corporation and its stockholders, and authorizing the appropriate officers of this corporation to solicit the consent of the stockholders therefor, which resolution setting forth the proposed amendment and restatement is as follows:

RESOLVED, that the Second Amended and Restated Certificate of Incorporation of this corporation, as amended, be amended and restated in its entirety to read as follows:

FIRST: The name of this corporation is Magenta Therapeutics, Inc. (the “**Corporation**”)

SECOND: The address of the registered office of the Corporation in the State of Delaware is Corporation Trust Center, 1209 Orange Street, in the City of Wilmington, New Castle County, Delaware 19801. The name of its registered agent at such address is The Corporation Trust Company.

THIRD: The nature of the business or purposes to be conducted or promoted is to engage in any lawful act or activity for which corporations may be organized under the General Corporation Law.

FOURTH: (i) The total number of shares of all classes of stock which the Corporation shall have authority to issue is 85,000,000 shares of Common Stock, \$0.001 par value per share (“**Common Stock**”) and 60,404,527 shares of Preferred Stock, \$0.001 par value per share (“**Preferred Stock**”).

The following is a statement of the designations and the powers, privileges and rights, and the qualifications, limitations or restrictions thereof in respect of each class of capital stock of the Corporation.

A. COMMON STOCK

1. General. The voting, dividend and liquidation rights of the holders of the Common Stock are subject to and qualified by the rights, powers and preferences of the holders of the Preferred Stock set forth herein.

2. Voting. The holders of the Common Stock are entitled to one vote for each share of Common Stock held at all meetings of stockholders (and written actions in lieu of meetings); provided, however, that, except as otherwise required by law, holders of Common Stock, as such, shall not be entitled to vote on any amendment to the Corporation’s Certificate of Incorporation (the “**Certificate of Incorporation**”) that relates solely to the terms of one or more outstanding series of Preferred Stock if the holders of such affected series are entitled, either separately or together with the holders of one or more other such series, to vote thereon pursuant to the Certificate of Incorporation or pursuant to the General Corporation Law. The number of authorized shares of Common Stock may be increased or decreased (but not below the number of shares thereof then outstanding) by (in addition to any vote of the holders of one or more series of Preferred Stock that may be required by the terms of the Certificate of Incorporation) the affirmative vote of the holders of shares of capital stock of the Corporation representing a majority of the votes represented by all outstanding shares of capital stock of the Corporation entitled to vote, irrespective of the provisions of Section 242(b)(2) of the General Corporation Law.

B. PREFERRED STOCK

Preferred Stock may be issued from time to time in one or more series, each of such series to consist of such number of shares and to have such terms, rights, powers and preferences, and the qualifications and limitations with respect thereto, as stated or expressed herein.

35,663,974 shares of the authorized Preferred Stock of the Corporation are hereby designated “**Series A Preferred Stock**”, 13,514,553 shares of the authorized Preferred Stock are hereby designated “**Series B Preferred Stock**”, and 11,226,000 shares of the authorized Preferred Stock are hereby designated “**Series C Preferred Stock**”, with the following rights, preferences, powers, privileges and restrictions, qualifications and limitations. Unless otherwise indicated, references to “Sections” and “Subsections” in this Part B of this Article Fourth refer to sections and subsections of Part B of this Article Fourth.

1. Dividends.

1.1 The Corporation shall not declare, pay or set aside any dividends on shares of any class or series of capital stock of the Corporation (other than dividends on shares of Common Stock payable in shares of Common Stock) unless (in addition to the obtaining of any consents required elsewhere in the Certificate of Incorporation) the holders of the Preferred Stock then outstanding shall first receive, or simultaneously receive, a dividend on each outstanding share of Preferred Stock in an amount at least equal to (i) in the case of a dividend on Common Stock or any class or series that is convertible into Common Stock, the product of (1) the amount of the dividend payable on each share of such class or series determined, if applicable, as if all shares of such class or series had been converted into Common Stock and (2) the number of shares of Common Stock issuable upon conversion of such share of Preferred Stock, in each case calculated on the record date for determination of holders entitled to receive such dividend or (ii) in the case of a dividend on any class or series that is not convertible into Common Stock, the amount determined by (1) dividing the amount of the dividend payable on each share of such class or series of capital stock by the original issuance price per share of such class or series of capital stock (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to such class or series) and (2) multiplying such fraction by the Applicable Preferred Stock Original Issue Price (as defined below); provided that, if the Corporation declares, pays or sets aside, on the same date, a dividend on shares of more than one class or series of capital stock of the Corporation, the dividend payable to the holders of Preferred Stock pursuant to this clause (a) shall be calculated (separately for holders of the Series A Preferred Stock, the Series B Preferred Stock, and the Series C Preferred Stock) based upon the dividend on the class or series of capital stock that would result in the highest dividend to such holders of Preferred Stock.

1.2 For purposes hereof, the “**Applicable Preferred Stock Original Issue Price**” shall mean (a) in the case of the Series A Preferred Stock, \$1.00 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series A Preferred Stock, (b) in the case of the Series B Preferred Stock, \$3.8847 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series B Preferred Stock, and (c) in the case of the Series C Preferred Stock, \$4.66 per share, subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization with respect to the Series C Preferred Stock.

2. Liquidation, Dissolution or Winding Up; Certain Mergers, Consolidations and Asset Sales.

2.1 Preferential Payments to Holders of Preferred Stock. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event (as defined below), the holders of shares of Preferred Stock then outstanding shall be entitled, on a pari passu basis and prior to any payments in respect of common stock, to be paid out of the assets of the Corporation available for distribution to its stockholders before any payment shall be made to the holders of Common Stock by reason of their ownership thereof, an amount per share equal to the greater of (i) the Applicable Preferred Stock Original Issue Price, plus any dividends declared but unpaid thereon, or (ii) such amount as would have been payable in respect of such share had all shares of such series of Preferred Stock been converted into Common Stock pursuant to Section 4 immediately prior to such liquidation, dissolution or winding

up of the Corporation or Deemed Liquidation Event. If upon any such liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, the assets of the Corporation available for distribution to its stockholders shall be insufficient to pay the holders of shares of Preferred Stock the full amount to which they shall be entitled under this Subsection 2.1, the holders of shares of Preferred Stock shall share ratably in any distribution of the assets available for distribution in proportion to the respective amounts which would otherwise be payable in respect of the shares held by them upon such distribution if all amounts payable on or with respect to such shares were paid in full. The amount which a holder of a share of any series of Preferred Stock is entitled to receive under the first sentence of this Subsection 2.1 is hereinafter referred to as the “Applicable Preferred Stock Liquidation Amount” with respect to such share.

2.2 Distribution of Remaining Assets. In the event of any voluntary or involuntary liquidation, dissolution or winding up of the Corporation or Deemed Liquidation Event, after the payment of all preferential amounts required to be paid to the holders of shares of Preferred Stock, the remaining assets of the Corporation available for distribution to its stockholders shall be distributed among the holders of the shares of Common Stock, pro rata based on the number of shares held by each such holder.

2.3 Deemed Liquidation Events.

2.3.1 Definition. Each of the following events shall be considered a “**Deemed Liquidation Event**” unless the holders of sixty percent (60%) of the then outstanding shares of Preferred Stock, voting or consenting together as a single class on an as-converted basis (the “**Required Vote**”), elect otherwise by written notice sent to the Corporation at least ten (10) days prior to the effective date of any such event:

(a) a merger or consolidation in which

(i) the Corporation is a constituent party or

(ii) a subsidiary of the Corporation is a constituent party and the Corporation issues shares of its capital stock pursuant to such merger or consolidation, except any such merger or consolidation involving the Corporation or a subsidiary in which the shares of capital stock of the Corporation outstanding immediately prior to such merger or consolidation continue to represent, or are converted into or exchanged for shares of capital stock that represent, immediately following such merger or consolidation, at least a majority, by voting power, of the capital stock of (1) the surviving or resulting corporation or (2) if the surviving or resulting corporation is a wholly owned subsidiary of another corporation immediately following such merger or consolidation, the parent corporation of such surviving or resulting corporation; or

(b) the sale, lease, transfer, exclusive license or other disposition, in a single transaction or series of related transactions, by the Corporation or any subsidiary of the Corporation of all or substantially all the assets of the Corporation and its subsidiaries taken as a whole or the sale or disposition (whether by merger, consolidation or otherwise) of one or more subsidiaries of the Corporation if substantially all of the assets of the Corporation and its subsidiaries taken as a whole are held by such subsidiary or subsidiaries, except where such sale, lease, transfer, exclusive license or other disposition is to a wholly owned subsidiary of the Corporation.

2.3.2 Effecting a Deemed Liquidation Event; Redemption

(a) The Corporation shall not have the power to effect a Deemed Liquidation Event referred to in Subsection 2.3.1(a)(i) above unless the agreement or plan of merger or consolidation for such transaction (the “**Merger Agreement**”) provides that the consideration payable to the stockholders of the Corporation shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 and 2.2 above.

(b) In the event of a Deemed Liquidation Event referred to in Subsection 2.3.1(a)(ii), or 2.3.1(b) above, if the Corporation does not effect a dissolution of the Corporation under the General Corporation Law within ninety (90) days after such Deemed Liquidation Event, then (i) the Corporation shall send a written notice to each holder of Preferred Stock no later than the ninetieth (90th) day after the Deemed Liquidation Event advising such holders of their right (and the requirements to be met to secure such right) pursuant to the terms of the following clause (ii) to require the redemption of such shares of Preferred Stock, and (ii) if the holders representing the Required Vote so request in a written instrument delivered to the Corporation not later than one hundred twenty (120) days after such Deemed Liquidation Event, the Corporation shall use the consideration received by the Corporation for such Deemed Liquidation Event (net of any retained liabilities associated with the assets sold or technology licensed, as determined in good faith by the Corporation’s Board of Directors (the “**Board of Directors**”) (together with any other assets of the Corporation available for distribution to its stockholders as determined in good faith by the Board of Directors, the “**Net Proceeds**”)), including a majority of the Preferred Directors then serving on the Board of Directors, all to the extent permitted by Delaware law governing distributions to stockholders, on the one hundred fiftieth (150th) day after such Deemed Liquidation Event, to redeem all outstanding shares of Preferred Stock at a price per share equal to the Applicable Preferred Stock Liquidation Amount. Notwithstanding the foregoing, in the event of a redemption pursuant to the preceding sentence, if the Net Proceeds are not sufficient to redeem all outstanding shares of Preferred Stock, or if the Corporation does not have sufficient lawfully available funds to effect such redemption, the Corporation shall redeem each holder’s shares of Preferred Stock ratably (based on the respective amounts that each holder would have received if all outstanding shares of Preferred Stock were redeemed as provided in clause (ii) above) to the fullest extent of such Net Proceeds or such lawfully available funds, as the case may be, and shall redeem the remaining shares ratably (in the same manner) as soon as it may lawfully do so under Delaware law governing distributions to stockholders. The provisions of Subsections 2.3.2(c)(i) through 2.3.2(c)(iv) below shall apply, with such necessary changes in the details thereof as are necessitated by the context, to the redemption of the Preferred Stock pursuant to this Subsection 2.3.2(b). Prior to the distribution or redemption provided for in this Subsection 2.3.2(b), the Corporation shall not expend or dissipate the consideration received for such Deemed Liquidation Event, except to discharge expenses incurred in connection with such Deemed Liquidation Event or in the ordinary course of business.

(c) The holders of the Preferred Stock shall have redemption rights as follows:

(i) Shares of Preferred Stock shall be redeemed by the Corporation at a price equal to the Applicable Preferred Stock Original Issue Price, plus any dividend declared but unpaid thereon (the “**Redemption Price**”) in three (3) annual installments commencing not more than sixty (60) days after receipt by the Corporation at any time on or after the fifth anniversary of the Series C Original Issue Date, from the holders representing the Required Vote, of written notice requesting redemption of all shares of Preferred Stock (the “**Redemption Request**”). Upon receipt of a Redemption Request, the Corporation shall apply all of its assets to any such redemption, and to no other corporate purpose, except to the extent prohibited by Delaware law governing distributions to stockholders. The date of each such installment shall be referred to as a “**Redemption Date.**” On each Redemption Date, the Corporation shall redeem, each holder’s shares of Preferred Stock ratably (based on the respective amounts that each holder would have received if all outstanding shares of Preferred Stock were redeemed on such Redemption Date) to the extent of an aggregate Redemption Price determined by dividing (i) the aggregate Redemption Price of all shares of Preferred Stock outstanding immediately prior to such Redemption Date by (ii) the number of remaining Redemption Dates (including the Redemption Date to which such calculation applies). If on any Redemption Date Delaware law governing distributions to stockholders prevents the Corporation from redeeming all shares of Preferred Stock to be redeemed, the Corporation shall redeem the maximum number of shares that it may redeem consistent with such law ratably (based on the respective amounts that each holder would have received if all shares of Preferred Stock to be redeemed on such Redemption Date were redeemed), and shall redeem the remaining shares ratably (in the same manner) as soon as it may lawfully do so under such law.

(ii) On or before any Redemption Date, each holder of shares of Preferred Stock to be redeemed on such Redemption Date, unless such holder has exercised his, her or its right to convert such shares as provided in Section 4, shall surrender the certificate or certificates representing such shares (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate) to the Corporation, and thereupon the Redemption Price for such shares shall be payable to the order of the person whose name appears on such certificate or certificates as the owner thereof.

(iii) If on the applicable Redemption Date the Redemption Price payable upon redemption of the shares of Preferred Stock to be redeemed on such Redemption Date is paid or tendered for payment or deposited with an independent payment agent so as to be available therefor, then notwithstanding that the certificates evidencing any of the shares of Preferred Stock so called for redemption shall not have been surrendered, all rights with respect to such shares shall forthwith after the Redemption Date terminate, except only the right of the holders to receive the Redemption Price without interest upon surrender of their certificate or certificates therefor.

(iv) Any shares of Preferred Stock that are redeemed or otherwise acquired by the Corporation or any of its subsidiaries shall be automatically and immediately cancelled and retired and shall not be reissued, sold or transferred. Neither the Corporation nor any of its subsidiaries may exercise any voting or other rights granted to the holders of Preferred Stock following redemption.

2.3.3 Amount Deemed Paid or Distributed. If the amount deemed paid or distributed under this Subsection 2.3 is made in property other than in cash, the value of such payment or distribution shall be the fair market value of such property, determined as follows:

(a) For securities not subject to investment letters or other similar restrictions on free marketability,

(i) if traded on a securities exchange, the value shall be deemed to be the average of the closing prices of the securities on such exchange or market over the 30-period ending three (3) days prior to the closing of such transaction;

(ii) if actively traded over-the-counter, the value shall be deemed to be the average of the closing bid prices over the 30-day period ending three (3) days prior to the closing of such transaction; or

(iii) if there is no active public market, the value shall be the fair market value thereof, as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

(b) The method of valuation of securities subject to investment letters or other similar restrictions on free marketability (other than restrictions arising solely by virtue of a stockholder's status as an affiliate or former affiliate) shall take into account an appropriate discount (as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors) from the market value as determined pursuant to clause (a) above so as to reflect the approximate fair market value thereof.

(c) For any property not addressed by Subsection 2.3.3(a) or Subsection 2.3.3(b), the value of such property shall be determined in good faith by the Board of Directors of the Corporation, including all Preferred Directors (as defined below) then serving on the Board of Directors.

2.3.4 Allocation of Escrow or Contingent Payments. In the event of a Deemed Liquidation Event pursuant to Subsection 2.3.1(a)(i), if any portion of the consideration payable to the stockholders of the Corporation is payable only upon satisfaction of contingencies (the "**Additional Consideration**"), the Merger Agreement shall provide that (a) the portion of such consideration that is not Additional Consideration (such portion, the "**Initial Consideration**") shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 and 2.2 as if the Initial Consideration were the only consideration payable in connection with such Deemed Liquidation Event and (b) any Additional Consideration which becomes payable to the stockholders of the Corporation upon satisfaction of such contingencies shall be allocated among the holders of capital stock of the Corporation in accordance with Subsections 2.1 and 2.2 after taking into account the previous payment of the Initial Consideration as part of the same transaction. For the purposes of this Subsection 2.3.4, consideration placed into escrow or retained as holdback to be available for satisfaction of indemnification or similar obligations or otherwise subject to contingencies in connection with such Deemed Liquidation Event shall be deemed to be Additional Consideration.

3. Voting.

3.1 General. On any matter presented to the stockholders of the Corporation for their action or consideration at any meeting of stockholders of the Corporation (or by written consent of stockholders in lieu of a meeting), each holder of outstanding shares of Preferred Stock shall be entitled to cast the number of votes equal to the number of whole shares of Common Stock into which the shares of Preferred Stock held by such holder are convertible as of the record date for determining stockholders entitled to vote on such matter. Except as provided by law or by the other provisions of the Certificate of Incorporation, holders of Preferred Stock shall vote together with the holders of Common Stock as a single class, on an as-converted basis.

3.2 Election of Directors. The holders of record of the shares of Series A Preferred Stock, exclusively and as a separate class, shall be entitled to elect two (2) directors of the Corporation. The directors to be elected pursuant to the first sentence of this Subsection 3.2 shall be referred to herein as the “**Series A Directors.**” Any Series A Director may be removed without cause by, and only by, the affirmative vote of the holders of the shares of the class or series of capital stock entitled to elect such director or directors, given either at a special meeting of such stockholders duly called for that purpose or by a written consent of stockholders in lieu of a meeting. The holders of record of the shares of Series B Preferred Stock, exclusively and as a separate class, shall be entitled to elect one (1) director of the Corporation. The director to be elected pursuant to the fourth sentence of this Subsection 3.2 shall be referred to herein as the “**Series B Director**” (and together with the Series A Directors, the “**Preferred Directors**”). The Series B Director may be removed without cause by, and only by, the affirmative vote of the holders of the shares of the class or series of capital stock entitled to elect such director, given either at a special meeting of such stockholders duly called for that purpose or by a written consent of stockholders in lieu of a meeting. The holders of record of the shares of Common Stock and of any other class or series of voting stock (including the Preferred Stock), voting together as a single class on an as converted basis, shall be entitled to elect the balance of the total number of directors of the Corporation. At any meeting held for the purpose of electing a director, the presence in person or by proxy of the holders of a majority of the outstanding shares of the class or series entitled to elect such director shall constitute a quorum for the purpose of electing such director. A vacancy in any directorship filled by the holders of any class or series shall be filled only by vote or written consent in lieu of a meeting of the holders of such class or series or by any remaining director or directors elected by the holders of such class or series pursuant to this Subsection 3.2.

3.3 Preferred Stock Protective Provisions. At any time when any shares of Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders representing the Required Vote, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) liquidate, dissolve or wind-up the business and affairs of the Corporation, effect any merger, acquisition or consolidation or any other Deemed Liquidation Event, or consent to any of the foregoing;

(b) amend, alter or repeal any provision of the Certificate of Incorporation or Bylaws of the Corporation;

(c) create or authorize the creation of or issue or obligate itself to issue shares of any other security convertible into or exercisable for any equity security or increase the authorized number of shares of Series A Preferred Stock, Series B Preferred Stock, or Series C Preferred Stock or of any additional class or series of capital stock unless it ranks junior to the Series A Preferred Stock, the Series B Preferred Stock, and the Series C Preferred Stock;

(d) reclassify, alter or amend any existing security that is junior to or on parity with the Series A Preferred Stock, the Series B Preferred Stock, or the Series C Preferred Stock, if such reclassification, alteration or amendment would render such other security senior to or on parity with the Series A Preferred Stock, the Series B Preferred Stock, or the Series C Preferred Stock;

(e) purchase or redeem or pay or declare any dividend, or make any distribution on any shares of capital stock prior to the Preferred Stock, other than Common Stock repurchased from former employees or consultants in connection with the cessation of their employment/services, pursuant to the provisions of existing plans or agreements;

(f) increase or decrease the authorized number of directors constituting the Board of Directors;

(g) create or hold capital stock in any subsidiary that is not a wholly-owned subsidiary of the Corporation or dispose of any subsidiary stock or all or substantially all of any subsidiary assets; or

(h) sell, assign, license, pledge or encumber material technology or intellectual property, other than licenses granted in the ordinary course of business.

3.4 Series C Preferred Stock Protective Provisions. At any time when any shares of Series C Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders of a majority of the then outstanding shares of Series C Preferred Stock, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) amend, alter or repeal any provision of the Certificate of Incorporation of the Corporation in a manner that adversely affects the powers, preferences or rights of the Series C Preferred Stock (provided that the creation or issuance of a new series of preferred stock *pari passu* with or senior to the Series C Preferred Stock with correlative amendments to the terms of the Corporation's Certificate of Incorporation which is approved in the manner prescribed in Section 3.3 shall not in and of itself trigger such provision);

(b) purchase or redeem or pay or declare any dividend or make any distribution on, any shares of capital stock of the Corporation prior to the Series C Preferred Stock other than repurchases of stock from former employees, officers, directors, consultants or other persons who performed services for the Corporation or any subsidiary in connection with the cessation of such employment or service at the lower of the original purchase price or the then-current fair market value thereof; or

(c) increase or decrease the authorized number of shares of Series C Preferred Stock.

3.5 Series B Preferred Stock Protective Provisions. At any time when any shares of Series B Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders of a majority of the then outstanding shares of Series B Preferred Stock, given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) amend, alter or repeal any provision of the Certificate of Incorporation of the Corporation in a manner that adversely affects the powers, preferences or rights of the Series B Preferred Stock (provided that the creation or issuance of a new series of preferred stock *pari passu* with or senior to the Series B Preferred Stock with correlative amendments to the terms of the Corporation's Certificate of Incorporation shall not in and of itself trigger such provision);

(b) purchase or redeem or pay or declare any dividend or make any distribution on, any shares of capital stock of the Corporation prior to the Series B Preferred Stock other than repurchases of stock from former employees, officers, directors, consultants or other persons who performed services for the Corporation or any subsidiary in connection with the cessation of such employment or service at the lower of the original purchase price or the then-current fair market value thereof; or

(c) increase or decrease the authorized number of shares of Series B Preferred Stock.

3.6 Series A Preferred Stock Protective Provisions. At any time when any shares of Series A Preferred Stock are outstanding, the Corporation or any of its subsidiaries shall not, either directly or indirectly by amendment, merger, consolidation or otherwise, do any of the following without (in addition to any other vote required by law or the Certificate of Incorporation) the written consent or affirmative vote of the holders representing seventy-five percent (75%) the outstanding shares of Series A Preferred Stock (the "**Required Series A Vote**"), given in writing or by vote at a meeting, consenting or voting (as the case may be) separately as a class, and any such act or transaction entered into without such consent or vote shall be null and void *ab initio*, and of no force or effect:

(a) amend, alter or repeal any provision of the Certificate of Incorporation of the Corporation in a manner that adversely affects the powers, preferences or rights of the Series A Preferred Stock (provided that the creation or issuance of a new series of preferred stock *pari passu* with or senior to the Series A Preferred Stock with correlative amendments to the terms of the Corporation's Certificate of Incorporation shall not in and of itself trigger such provision);

(b) purchase or redeem or pay or declare any dividend or make any distribution on, any shares of capital stock of the Corporation prior to the Preferred Stock other than repurchases of stock from former employees, officers, directors, consultants or other persons who performed services for the Corporation or any subsidiary in connection with the cessation of such employment or service at the lower of the original purchase price or the then-current fair market value thereof; or

(c) increase or decrease the authorized number of shares of Series A Preferred Stock.

4. Optional Conversion.

The holders of the Preferred Stock shall have conversion rights as follows (the “**Conversion Rights**”):

4.1 Right to Convert.

4.1.1 Conversion Ratio. Each share of Preferred Stock shall be convertible, at the option of the holder thereof, at any time and from time to time, and without the payment of additional consideration by the holder thereof, into such number of fully paid and nonassessable shares of Common Stock as is determined by dividing the Applicable Preferred Stock Original Issue Price by the Applicable Preferred Stock Conversion Price (as defined below) in effect at the time of conversion. For purposes hereof, the “**Applicable Preferred Stock Conversion Price**” shall initially be equal to (a) in the case of the Series A Preferred Stock, \$1.00, (b) in the case of the Series B Preferred Stock, \$3.8847, and (c) in the case of the Series C Preferred Stock, \$4.66. Such initial Applicable Preferred Stock Conversion Price, and the rate at which shares of Preferred Stock may be converted into shares of Common Stock, shall be subject to adjustment as provided below.

4.1.2 Termination of Conversion Rights. In the event of a notice of redemption of any shares of Preferred Stock pursuant to Subsection 2.3.2(c), the Conversion Rights of the shares designated for redemption shall terminate at the close of business on the last full day preceding the date fixed for redemption, unless the Redemption Price is not fully paid on such Redemption Date, in which case the Conversion Rights for such shares shall continue until such price is paid in full. In the event of a liquidation, dissolution or winding up of the Corporation or a Deemed Liquidation Event, the Conversion Rights shall terminate at the close of business on the last full day preceding the date fixed for the payment of any amounts distributable on such event to the holders of Preferred Stock.

4.2 Fractional Shares. No fractional shares of Common Stock shall be issued upon conversion of the Preferred Stock. In lieu of any fractional shares to which the holder would otherwise be entitled, the Corporation shall pay cash equal to such fraction multiplied by the fair market value of a share of Common Stock as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors. Whether or not fractional shares would be issuable upon such conversion shall be determined on the basis of the total number of shares of Preferred Stock the holder is at the time converting into Common Stock and the aggregate number of shares of Common Stock issuable upon such conversion.

4.3 Mechanics of Conversion.

4.3.1 Notice of Conversion. In order for a holder of Preferred Stock to voluntarily convert shares of Preferred Stock into shares of Common Stock, such holder shall surrender the certificate or certificates for such shares of Preferred Stock (or, if such registered holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate), at the office of the transfer agent for the Preferred Stock (or at the principal office of the Corporation if the Corporation serves as its own transfer agent), together with written notice that such holder elects to convert all or any number of the shares of Preferred Stock represented by such certificate or certificates and, if applicable, any event on which such conversion is contingent. Such notice shall state such holder's name or the names of the nominees in which such holder wishes the certificate or certificates for shares of Common Stock to be issued. If required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by a written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or his, her or its attorney duly authorized in writing. The close of business on the date of receipt by the transfer agent (or by the Corporation if the Corporation serves as its own transfer agent) of such certificates (or lost certificate affidavit and agreement) and notice shall be the time of conversion (the "**Conversion Time**"), and the shares of Common Stock issuable upon conversion of the shares represented by such certificate shall be deemed to be outstanding of record as of such date. The Corporation shall, as soon as practicable after the Conversion Time, (i) issue and deliver to such holder of Preferred Stock, or to his, her or its nominees, a certificate or certificates for the number of full shares of Common Stock issuable upon such conversion in accordance with the provisions hereof and, a certificate for the number (if any) of the shares of Preferred Stock represented by the surrendered certificate that were not converted into Common Stock, (ii) pay in cash such amount as provided in Subsection 4.2 in lieu of any fraction of a share of Common Stock otherwise issuable upon such conversion and (iii) pay all declared but unpaid dividends on the shares of Preferred Stock converted.

4.3.2 Reservation of Shares. The Corporation shall at all times when the Preferred Stock shall be outstanding, reserve and keep available out of its authorized but unissued capital stock, for the purpose of effecting the conversion of the Preferred Stock, such number of its duly authorized shares of Common Stock as shall from time to time be sufficient to effect the conversion of all outstanding Preferred Stock; and if at any time the number of authorized but

unissued shares of Common Stock shall not be sufficient to effect the conversion of all then outstanding shares of the Preferred Stock, the Corporation shall take such corporate action as may be necessary to increase its authorized but unissued shares of Common Stock to such number of shares as shall be sufficient for such purposes, including, without limitation, engaging in best efforts to obtain the requisite stockholder approval of any necessary amendment to the Certificate of Incorporation. Before taking any action which would cause an adjustment reducing the Applicable Preferred Stock Conversion Price below the then par value of the shares of Common Stock issuable upon conversion of the Preferred Stock, the Corporation will take any corporate action which may, in the opinion of its counsel, be necessary in order that the Corporation may validly and legally issue fully paid and nonassessable shares of Common Stock at such adjusted Applicable Preferred Stock Conversion Price.

4.3.3 Effect of Conversion. All shares of Preferred Stock which shall have been surrendered for conversion as herein provided shall no longer be deemed to be outstanding and all rights with respect to such shares shall immediately cease and terminate at the Conversion Time, except only the right of the holders thereof to receive shares of Common Stock in exchange therefor and to receive payment in lieu of any fraction of a share otherwise issuable upon such conversion as provided in Subsection 4.2 and to receive payment of any dividends declared but unpaid thereon. Any shares of Preferred Stock so converted shall be retired and cancelled and may not be reissued as shares of such series, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Preferred Stock accordingly.

4.3.4 No Further Adjustment. Upon any such conversion, no adjustment to the Applicable Preferred Stock Conversion Price shall be made for any declared but unpaid dividends on the Preferred Stock surrendered for conversion or on the Common Stock delivered upon conversion.

4.3.5 Taxes. The Corporation shall pay any and all issue and other similar taxes that may be payable in respect of any issuance or delivery of shares of Common Stock upon conversion of shares of Preferred Stock pursuant to this Section 4. The Corporation shall not, however, be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of shares of Common Stock in a name other than that in which the shares of Preferred Stock so converted were registered, and no such issuance or delivery shall be made unless and until the person or entity requesting such issuance has paid to the Corporation the amount of any such tax or has established, to the satisfaction of the Corporation, that such tax has been paid.

4.4 Adjustments to Applicable Preferred Stock Conversion Price for Diluting Issues.

4.4.1 Special Definitions. For purposes of this Article Fourth, the following definitions shall apply:

(a) “**Option**” shall mean rights, options or warrants to subscribe for, purchase or otherwise acquire Common Stock or Convertible Securities.

(b) “**Series C Original Issue Date**” shall mean the date on which the first share of Series C Preferred Stock was issued.

(c) “**Convertible Securities**” shall mean any evidences of indebtedness, shares or other securities directly or indirectly convertible into or exchangeable for Common Stock, but excluding Options.

(d) “**Additional Shares of Common Stock**” shall mean all shares of Common Stock issued (or, pursuant to Subsection 4.4.3 below, deemed to be issued) by the Corporation after the Series C Original Issue Date, other than (1) the following shares of Common Stock and (2) shares of Common Stock deemed issued pursuant to the following Options and Convertible Securities (clauses (1) and (2), collectively “**Exempted Securities**”):

(i) shares of Common Stock, Options or Convertible Securities issued as a dividend or distribution on, or upon the conversion of, Preferred Stock, and shares of Common Stock actually issued upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, upon the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security;

(ii) shares of Common Stock, Options or Convertible Securities issued by reason of a dividend, stock split, split-up or other distribution on shares of Common Stock that is covered by Subsections 4.5, 4.6, 4.7 or 4.8 below, and shares of Common Stock actually issued upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security;

(iii) shares of Common Stock or Options issued to employees or directors of, or consultants or advisors to, the Corporation or any of its subsidiaries pursuant to a plan, agreement or arrangement approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and shares of Common Stock actually issued upon the exercise or conversion of such Options, in each case provided such issuance is pursuant to the terms of such Option;

(iv) shares of Common Stock, Options or Convertible Securities issued to banks, equipment lessors or other financial institutions, or to real property lessors, pursuant to a debt financing, equipment leasing or real property leasing transaction approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and shares of Common Stock actually issued upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security; and

(v) shares of Common Stock, Options or Convertible Securities issued in connection with sponsored research, collaboration, technology license,

development, OEM, marketing or other similar agreements or strategic partnerships approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and shares of Common Stock issuable upon the exercise of such Options, or upon the conversion or exchange of such Convertible Securities or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, in each case provided such issuance is pursuant to the terms of such Option or Convertible Security.

4.4.2 No Adjustment of Series A Conversion Price. No adjustment in the Series A Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the holders representing the Required Series A Vote, voting as a separate class on an as-converted basis, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

4.4.3 No Adjustment of Series B Conversion Price. No adjustment in the Series B Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the holders of a majority of the then outstanding shares of Series B Preferred Stock, voting as a separate class on an as-converted basis, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

4.4.4 No Adjustment of Series C Conversion Price. No adjustment in the Series C Conversion Price shall be made as the result of the issuance or deemed issuance of Additional Shares of Common Stock if the Corporation receives written notice from the holders of a majority of the then outstanding shares of Series C Preferred Stock, voting as a separate class on an as-converted basis, agreeing that no such adjustment shall be made as the result of the issuance or deemed issuance of such Additional Shares of Common Stock.

4.4.5 Deemed Issue of Additional Shares of Common Stock.

(a) If the Corporation at any time or from time to time after the Series C Original Issue Date shall issue any Options or Convertible Securities (excluding Options or Convertible Securities which are themselves Exempted Securities) or shall fix a record date for the determination of holders of any class of securities entitled to receive any such Options or Convertible Securities, then the maximum number of shares of Common Stock (as set forth in the instrument relating thereto, assuming the satisfaction of any conditions to exercisability, convertibility or exchangeability but without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or, in the case of Convertible Securities and Options therefor, the conversion or exchange of such Convertible Securities, shall be deemed to be Additional Shares of Common Stock issued as of the time of such issue or, in case such a record date shall have been fixed, as of the close of business on such record date.

(b) If the terms of any Option or Convertible Security, the issuance of which resulted in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 below, are revised as a result of an amendment to such

terms or if any other adjustment is made pursuant to the provisions of such Option or Convertible Security (but excluding automatic adjustments to such terms pursuant to anti-dilution or similar provisions of such Option or Convertible Security) to provide for either (1) any increase or decrease in the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any such Option or Convertible Security or (2) any increase or decrease in the consideration payable to the Corporation upon such exercise, conversion and/or exchange, then, effective upon such increase or decrease becoming effective, the Applicable Preferred Stock Conversion Price computed upon the original issue of such Option or Convertible Security (or upon the occurrence of a record date with respect thereto) shall be readjusted to such Applicable Preferred Stock Conversion Price as would have been obtained had such revised terms been in effect upon the original date of issuance of such Option or Convertible Security. Notwithstanding the foregoing, no readjustment pursuant to this clause (b) shall have the effect of increasing the Applicable Preferred Stock Conversion Price to an amount which exceeds the lower of (i) the Applicable Preferred Stock Conversion Price in effect immediately prior to the original adjustment made as a result of the issuance of such Option or Convertible Security, or (ii) the Applicable Preferred Stock Conversion Price that would have resulted from any issuances of Additional Shares of Common Stock (other than deemed issuances of Additional Shares of Common Stock as a result of the issuance of such Option or Convertible Security) between the original adjustment date and such readjustment date.

(c) If the terms of any Option or Convertible Security (excluding Options or Convertible Securities which are themselves Exempted Securities), the issuance of which did not result in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 below (either because the consideration per share (determined pursuant to Subsection 4.4.5 hereof) of the Additional Shares of Common Stock subject thereto was equal to or greater than the Applicable Preferred Stock Conversion Price then in effect, or because such Option or Convertible Security was issued before the Series C Original Issue Date), are revised after the Series C Original Issue Date as a result of an amendment to such terms or any other adjustment pursuant to the provisions of such Option or Convertible Security (but excluding automatic adjustments to such terms pursuant to anti-dilution or similar provisions of such Option or Convertible Security) to provide for either (1) any increase in the number of shares of Common Stock issuable upon the exercise, conversion or exchange of any such Option or Convertible Security or (2) any decrease in the consideration payable to the Corporation upon such exercise, conversion or exchange, then such Option or Convertible Security, as so amended or adjusted, and the Additional Shares of Common Stock subject thereto (determined in the manner provided in Subsection 4.4.3(a) above) shall be deemed to have been issued effective upon such increase or decrease becoming effective.

(d) Upon the expiration or termination of any unexercised Option or unconverted or unexchanged Convertible Security (or portion thereof) which resulted (either upon its original issuance or upon a revision of its terms) in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 below, the Applicable Preferred Stock Conversion Price shall be readjusted to such Applicable Preferred Stock Conversion Price as would have been obtained had such Option or Convertible Security (or portion thereof) never been issued.

(e) If the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any Option or Convertible Security, or the consideration payable to the Corporation upon such exercise, conversion and/or exchange, is calculable at the time such Option or Convertible Security is issued or amended but is subject to adjustment based upon subsequent events, any adjustment to the Applicable Preferred Stock Conversion Price provided for in this Subsection 4.4.3 shall be effected at the time of such issuance or amendment based on such number of shares or amount of consideration without regard to any provisions for subsequent adjustments (and any subsequent adjustments shall be treated as provided in clauses (b) and (c) of this Subsection 4.4.3). If the number of shares of Common Stock issuable upon the exercise, conversion and/or exchange of any Option or Convertible Security, or the consideration payable to the Corporation upon such exercise, conversion and/or exchange, cannot be calculated at all at the time such Option or Convertible Security is issued or amended, any adjustment to the Applicable Preferred Stock Conversion Price that would result under the terms of this Subsection 4.4.3 at the time of such issuance or amendment shall instead be effected at the time such number of shares and/or amount of consideration is first calculable (even if subject to subsequent adjustments), assuming for purposes of calculating such adjustment to the Applicable Preferred Stock Conversion Price that such issuance or amendment took place at the time such calculation can first be made.

4.4.6 Adjustment of Applicable Preferred Stock Conversion Price Upon Issuance of Additional Shares of Common Stock. In the event the Corporation shall at any time or from time to time after the Series C Original Issue Date issue Additional Shares of Common Stock (including Additional Shares of Common Stock deemed to be issued pursuant to Subsection 4.4.3), without consideration or for a consideration per share less than the Applicable Preferred Stock Conversion Price in effect immediately prior to such issue, then the Applicable Preferred Stock Conversion Price shall be reduced, concurrently with such issue, to a price (calculated to the nearest one-hundredth of a cent) determined in accordance with the following formula:

$$CP_2 = (CP_1 * (A + B)) \div (A + C).$$

For purposes of the foregoing formula, the following definitions shall apply:

(a) “CP₂” shall mean the Applicable Preferred Stock Conversion Price in effect immediately after such issue of Additional Shares of Common Stock;

(b) “CP₁” shall mean the Applicable Preferred Stock Conversion Price in effect immediately prior to such issue of Additional Shares of Common Stock;

(c) “A” shall mean the number of shares of Common Stock outstanding immediately prior to such issue of Additional Shares of Common Stock (treating for this purpose as outstanding all shares of Common Stock issuable upon exercise of Options outstanding immediately prior to such issue or upon conversion or exchange of Convertible Securities (including the Preferred Stock) outstanding (assuming exercise of any outstanding Options therefor) immediately prior to such issue);

(d) “B” shall mean the number of shares of Common Stock that would have been issued if such Additional Shares of Common Stock had been issued at a price per share equal to CP₁ (determined by dividing the aggregate consideration received by the Corporation in respect of such issue by CP₁); and

(e) "C" shall mean the number of such Additional Shares of Common Stock issued in such transaction.

4.4.7 Determination of Consideration. For purposes of this Subsection 4.4, the consideration received by the Corporation for the issue of any Additional Shares of Common Stock shall be computed as follows:

(a) Cash and Property: Such consideration shall:

(i) insofar as it consists of cash, be computed at the aggregate amount of cash received by the Corporation, excluding amounts paid or payable for accrued interest;

(ii) insofar as it consists of property other than cash, be computed at the fair market value thereof at the time of such issue, as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors; and

(iii) in the event Additional Shares of Common Stock are issued together with other shares or securities or other assets of the Corporation for consideration which covers both, be the proportion of such consideration so received that is attributable to the Additional Shares of Common Stock, computed as provided in clauses (i) and (ii) above, as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

(b) Options and Convertible Securities. The consideration per share received by the Corporation for Additional Shares of Common Stock deemed to have been issued pursuant to Subsection 4.4.3, relating to Options and Convertible Securities, shall be determined by dividing

(i) the total amount, if any, received or receivable by the Corporation as consideration for the issue of such Options or Convertible Securities, plus the minimum aggregate amount of additional consideration (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such consideration) payable to the Corporation upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities, by

(ii) the maximum number of shares of Common Stock (as set forth in the instruments relating thereto, without regard to any provision contained therein for a subsequent adjustment of such number) issuable upon the exercise of such Options or the conversion or exchange of such Convertible Securities, or in the case of Options for Convertible Securities, the exercise of such Options for Convertible Securities and the conversion or exchange of such Convertible Securities.

4.4.8 Multiple Closing Dates. In the event the Corporation shall issue on more than one date Additional Shares of Common Stock that are a part of one transaction or a series of related transactions and that would result in an adjustment to the Applicable Preferred Stock Conversion Price pursuant to the terms of Subsection 4.4.4 above then, upon the final such issuance, the Applicable Preferred Stock Conversion Price shall be readjusted to give effect to all such issuances as if they occurred on the date of the first such issuance (and without giving effect to any additional adjustments as a result of any such subsequent issuances within such period).

4.5 Adjustment for Stock Splits and Combinations. If the Corporation shall at any time or from time to time after the Series C Original Issue Date effect a subdivision of the outstanding Common Stock, the Applicable Preferred Stock Conversion Price in effect immediately before that subdivision shall be proportionately decreased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be increased in proportion to such increase in the aggregate number of shares of Common Stock outstanding. If the Corporation shall at any time or from time to time after the Series C Original Issue Date combine the outstanding shares of Common Stock, the Applicable Preferred Stock Conversion Price in effect immediately before the combination shall be proportionately increased so that the number of shares of Common Stock issuable on conversion of each share of such series shall be decreased in proportion to such decrease in the aggregate number of shares of Common Stock outstanding. Any adjustment under this subsection shall become effective at the close of business on the date the subdivision or combination becomes effective.

4.6 Adjustment for Certain Dividends and Distributions. In the event the Corporation at any time or from time to time after the Series C Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable on the Common Stock in additional shares of Common Stock, then and in each such event the Applicable Preferred Stock Conversion Price in effect immediately before such event shall be decreased as of the time of such issuance or, in the event such a record date shall have been fixed, as of the close of business on such record date, by multiplying the Applicable Preferred Stock Conversion Price then in effect by a fraction:

- (1) the numerator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date, and
- (2) the denominator of which shall be the total number of shares of Common Stock issued and outstanding immediately prior to the time of such issuance or the close of business on such record date plus the number of shares of Common Stock issuable in payment of such dividend or distribution.

Notwithstanding the foregoing, (a) if such record date shall have been fixed and such dividend is not fully paid or if such distribution is not fully made on the date fixed therefor, the Applicable

Preferred Stock Conversion Price shall be recomputed accordingly as of the close of business on such record date and thereafter the Applicable Preferred Stock Conversion Price shall be adjusted pursuant to this subsection as of the time of actual payment of such dividends or distributions; and (b) no such adjustment shall be made if the holders of Preferred Stock simultaneously receive a dividend or other distribution of shares of Common Stock in a number equal to the number of shares of Common Stock they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event.

4.7 Adjustments for Other Dividends and Distributions. In the event the Corporation at any time or from time to time after the Series C Original Issue Date shall make or issue, or fix a record date for the determination of holders of Common Stock entitled to receive, a dividend or other distribution payable in securities of the Corporation (other than a distribution of shares of Common Stock in respect of outstanding shares of Common Stock) or in other property and the provisions of Section 1 do not apply to such dividend or distribution, then and in each such event the holders of Preferred Stock shall receive, simultaneously with the distribution to the holders of Common Stock, a dividend or other distribution of such securities or other property in an amount equal to the amount of such securities or other property they would have received if all outstanding shares of Preferred Stock had been converted into Common Stock on the date of such event.

4.8 Adjustment for Merger or Reorganization, etc. Subject to the provisions of Subsection 2.3, if there shall occur any reorganization, recapitalization, reclassification, consolidation or merger involving the Corporation in which the Common Stock (but not the Preferred Stock) is converted into or exchanged for securities, cash or other property (other than a transaction covered by Subsection 4.4, 4.6 or 4.7), then, following any such reorganization, recapitalization, reclassification, consolidation or merger, each share of Preferred Stock shall thereafter be convertible, in lieu of the Common Stock into which it was convertible prior to such event, into the kind and amount of securities, cash or other property which a holder of the number of shares of the Common Stock issuable upon conversion of one share of such series of Preferred Stock immediately prior to such reorganization, recapitalization, reclassification, consolidation or merger would have been entitled to receive pursuant to such transaction; and, in such case, appropriate adjustment (as determined in good faith by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors) shall be made in the application of the provisions in this Section 4 with respect to the rights and interests thereafter of the holders of the Preferred Stock, to the end that the provisions set forth in this Section 4 (including provisions with respect to changes in and other adjustments of the Applicable Preferred Stock Conversion Price) shall thereafter be applicable, as nearly as reasonably may be, in relation to any securities or other property thereafter deliverable upon the conversion of the Preferred Stock. For the avoidance of doubt, nothing in this Section 4.8 shall be construed as preventing the holders of Preferred Stock from seeking any appraisal rights to which they are otherwise entitled under the General Corporation Law in connection with a merger triggering an adjustment hereunder, nor shall this Subsection 4.8 be deemed conclusive evidence of the fair value of the shares of Preferred Stock in any such appraisal proceeding.

4.9 Certificate as to Adjustments. Upon the occurrence of each adjustment or readjustment of the Applicable Preferred Stock Conversion Price pursuant to this Section 4, the Corporation at its expense shall, as promptly as reasonably practicable but in any event not later than fifteen (15) days thereafter, compute such adjustment or readjustment in accordance with the terms hereof and furnish to each holder of Preferred Stock a certificate setting forth such adjustment or readjustment (including the kind and amount of securities, cash or other property

into which the Preferred Stock is convertible) and showing in detail the facts upon which such adjustment or readjustment is based. The Corporation shall, as promptly as reasonably practicable after the written request at any time of any holder of Preferred Stock (but in any event not later than fifteen (15) days thereafter), furnish or cause to be furnished to such holder a certificate setting forth (i) the Applicable Preferred Stock Conversion Price then in effect, and (ii) the number of shares of Common Stock and the amount, if any, of other securities, cash or property which then would be received upon the conversion of Preferred Stock.

4.10 Notice of Record Date. In the event:

(a) the Corporation shall take a record of the holders of its Common Stock (or other capital stock or securities at the time issuable upon conversion of the Preferred Stock) for the purpose of entitling or enabling them to receive any dividend or other distribution, or to receive any right to subscribe for or purchase any shares of capital stock of any class or any other securities, or to receive any other security; or

(b) of any capital reorganization of the Corporation, any reclassification of the Common Stock, or any Deemed Liquidation Event; or

(c) of the voluntary or involuntary dissolution, liquidation or winding-up of the Corporation, then, and in each such case, the Corporation will send or cause to be sent to the holders of the Preferred Stock a notice specifying, as the case may be, (i) the record date for such dividend, distribution or right, and the amount and character of such dividend, distribution or right, or (ii) the effective date on which such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation, winding-up or a Deemed Liquidation Event is proposed to take place, and the time, if any is to be fixed, as of which the holders of record of Common Stock (or such other capital stock or securities at the time issuable upon the conversion of the Preferred Stock) shall be entitled to exchange their shares of Common Stock (or such other capital stock or securities) for securities or other property deliverable upon such reorganization, reclassification, consolidation, merger, transfer, dissolution, liquidation, winding-up or a Deemed Liquidation Event, and the amount per share and character of such exchange applicable to the Preferred Stock and the Common Stock. Such notice shall be sent at least ten (10) days prior to the record date or effective date for the event specified in such notice.

5. Mandatory Conversion.

5.1 Trigger Events. Upon either (a) the date and time, or the occurrence of an event, specified by vote or written consent of the holders representing the Required Vote, or (b) the closing of the sale of shares of Common Stock to the public in a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended (the “**Securities Act**”) at a minimum price per share of \$5.592 as adjusted for any stock split or similar event, provided that such offering results in at least \$50 million of gross proceeds, after deducting the underwriting discount and commissions, to the Corporation, with such Common Stock listed on the NYSE or NASDAQ (the date and time specified or the time of the

event specified in such vote or written consent, or the time of such closing, respectively, is referred to herein as the “**Mandatory Conversion Time**”), (i) all outstanding shares of Preferred Stock shall automatically be converted into shares of Common Stock, at the then effective conversion rate thereof, and (ii) such shares of Preferred Stock may not be reissued by the Corporation.

5.2 Procedural Requirements. All holders of record of shares of Preferred Stock shall be sent written notice of the Mandatory Conversion Time and the place designated for mandatory conversion of all such shares of Preferred Stock pursuant to this Section 5. Such notice need not be sent in advance of the occurrence of the Mandatory Conversion Time. Upon receipt of such notice, each holder of shares of Preferred Stock shall surrender his, her or its certificate or certificates for all such shares (or, if such holder alleges that such certificate has been lost, stolen or destroyed, a lost certificate affidavit and agreement reasonably acceptable to the Corporation to indemnify the Corporation against any claim that may be made against the Corporation on account of the alleged loss, theft or destruction of such certificate) to the Corporation at the place designated in such notice. At the Mandatory Conversion Time, all outstanding shares of Preferred Stock shall be deemed to have been converted into shares of Common Stock (notwithstanding the failure of the holder or holders thereof to surrender any certificates at or prior to such time), which shall be deemed to be outstanding of record as of such time, and all rights with respect to the Preferred Stock so converted, including the rights, if any, to receive notices and vote (other than as a holder of Common Stock), will terminate, except only the rights of the holders thereof, upon surrender of their certificate or certificates (or lost certificate affidavit and agreement) therefor, to receive the items provided for in the last sentence of this Subsection 5.2, and to receive payment of any declared but unpaid dividends thereon. If so required by the Corporation, certificates surrendered for conversion shall be endorsed or accompanied by written instrument or instruments of transfer, in form satisfactory to the Corporation, duly executed by the registered holder or by his, her or its attorney duly authorized in writing. As soon as practicable after the Mandatory Conversion Time and the surrender of the certificate or certificates (or lost certificate affidavit and agreement) for Preferred Stock, the Corporation shall issue and deliver to such holder, or to his, her or its nominees, a certificate or certificates for the number of full shares of Common Stock issuable on such conversion in accordance with the provisions hereof, together with cash as provided in Subsection 4.2 in lieu of any fraction of a share of Common Stock otherwise issuable upon such conversion and the payment of any declared but unpaid dividends on the shares of Preferred Stock converted.

5.3 Effect of Mandatory Conversion. Such converted Preferred Stock shall be retired and cancelled and may not be reissued as shares of such series, and the Corporation may thereafter take such appropriate action (without the need for stockholder action) as may be necessary to reduce the authorized number of shares of Preferred Stock accordingly.

6. Redeemed or Otherwise Acquired Shares. Any shares of Preferred Stock that are redeemed or otherwise acquired by the Corporation or any of its subsidiaries shall be automatically and immediately cancelled and retired and shall not be reissued, sold or transferred. Neither the Corporation nor any of its subsidiaries may exercise any voting or other rights granted to the holders of Preferred Stock following redemption.

7. Waiver. Except as specifically stated herein, (a) any of the rights, powers, preferences and other terms of the Preferred Stock applicable to the Preferred Stock, generally

(and not to a specified series) set forth herein may be waived on behalf of all holders of Preferred Stock by the affirmative written consent or vote of the holders representing the Required Vote, (b) any of the rights, powers, preferences and other terms of the Series A Preferred Stock set forth herein may be waived on behalf of all holders of Series A Preferred Stock by the affirmative written consent or vote of the holders representing the Required Series A Vote, (c) any of the rights, powers, preferences and other terms of the Series B Preferred Stock set forth herein may be waived on behalf of all holders of Series B Preferred Stock by the affirmative written consent or vote of the holders of a majority of the then outstanding shares of Series B Preferred Stock, and (d) any of the rights, powers, preferences and other terms of the Series C Preferred Stock set forth herein may be waived on behalf of all holders of Series C Preferred Stock only by the affirmative written consent or vote of the holders of a majority of the then outstanding shares of Series C Preferred Stock.

8. **Notices.** Any notice required or permitted by the provisions of this Article Fourth to be given to a holder of shares of Preferred Stock shall be mailed, postage prepaid, to the post office address last shown on the records of the Corporation, or given by electronic communication in compliance with the provisions of the General Corporation Law, and shall be deemed sent upon such mailing or electronic transmission.

FIFTH: Subject to any additional vote required by the Certificate of Incorporation, in furtherance and not in limitation of the powers conferred by statute, the Board of Directors is expressly authorized to make, repeal, alter, amend and rescind any or all of the Bylaws of the Corporation.

SIXTH: Subject to any additional vote required by the Certificate of Incorporation, the number of directors of the Corporation shall be determined in the manner set forth in the Bylaws of the Corporation.

SEVENTH: Elections of directors need not be by written ballot unless the Bylaws of the Corporation shall so provide.

EIGHTH: Meetings of stockholders may be held within or without the State of Delaware, as the Bylaws of the Corporation may provide. The books of the Corporation may be kept outside the State of Delaware at such place or places as may be designated from time to time by the Board of Directors or in the Bylaws of the Corporation.

NINTH: To the fullest extent permitted by law, a director of the Corporation shall not be personally liable to the Corporation or its stockholders for monetary damages for breach of fiduciary duty as a director. If the General Corporation Law or any other law of the State of Delaware is amended after approval by the stockholders of this Article Ninth to authorize corporate action further eliminating or limiting the personal liability of directors, then the liability of a director of the Corporation shall be eliminated or limited to the fullest extent permitted by the General Corporation Law as so amended.

Any repeal or modification of the foregoing provisions of this Article Ninth by the stockholders of the Corporation shall not adversely affect any right or protection of a director of the Corporation existing at the time of, or increase the liability of any director of the Corporation with respect to any acts or omissions of such director occurring prior to, such repeal or modification.

TENTH: To the fullest extent permitted by applicable law, the Corporation is authorized to provide indemnification of (and advancement of expenses to) directors, officers and agents of the Corporation (and any other persons to which General Corporation Law permits the Corporation to provide indemnification) through Bylaw provisions, agreements with such agents or other persons, vote of stockholders or disinterested directors or otherwise, in excess of the indemnification and advancement otherwise permitted by Section 145 of the General Corporation Law.

Any amendment, repeal or modification of the foregoing provisions of this Article Tenth shall not adversely affect any right or protection of any director, officer or other agent of the Corporation existing at the time of such amendment, repeal or modification.

ELEVENTH: The Corporation renounces, to the fullest extent permitted by law, any interest or expectancy of the Corporation in, or in being offered an opportunity to participate in, any Excluded Opportunity (as defined below). An “**Excluded Opportunity**” is any matter, transaction or interest that is presented to, or acquired, created or developed by, or which otherwise comes into the possession of, (i) any director of the Corporation who is not an employee of the Corporation or any of its subsidiaries, or (ii) any holder of Preferred Stock or any partner, member, director, stockholder, employee or agent of any such holder, other than someone who is an employee of the Corporation or any of its subsidiaries ((i) and (ii) collectively, “**Covered Persons**”), unless such matter, transaction or interest is presented to, or acquired, created or developed by, or otherwise comes into the possession of, a Covered Person expressly and solely in such Covered Person’s capacity as a director of the Corporation.

* * *

3: That the foregoing amendment and restatement was approved by the holders of the requisite number of shares of this corporation in accordance with Section 228 of the General Corporation Law.

4: That this Third Amended and Restated Certificate of Incorporation, which restates and integrates and further amends the provisions of this Corporation’s Second Amended and Restated Certificate of Incorporation, has been duly adopted in accordance with Sections 242 and 245 of the General Corporation Law.

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IN WITNESS WHEREOF, this Second Amended and Restated Certificate of Incorporation has been executed by a duly authorized officer of this corporation on this 2nd day of April, 2018.

By: /s/ Jason Gardner

Name: Jason Gardner

Title: President and CEO

[SIGNATURE PAGE TO CHARTER]

MAGENTA THERAPEUTICS, INC.

SECOND AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

April 2, 2018

TABLE OF CONTENTS

	<u>Page</u>
1. Definitions	1
2. Registration Rights	5
2.1 Demand Registration	5
2.2 Company Registration	7
2.3 Underwriting Requirements	7
2.4 Obligations of the Company	8
2.5 Furnish Information	10
2.6 Expenses of Registration	10
2.7 Delay of Registration	10
2.8 Indemnification	11
2.9 Reports under Exchange Act	13
2.10 Limitations on Subsequent Registration Rights	13
2.11 "Market Stand-off" Agreement	13
2.12 Restrictions on Transfer	14
2.13 Termination of Registration Rights	16
3. Information	16
3.1 Delivery of Financial Statements	16
3.2 Inspection	17
3.3 Termination of Information Rights	17
3.4 Confidentiality	18
4. Rights to Future Stock Issuances	18
4.1 Right of First Offer	18
4.2 Termination	20
5. Additional Covenants	20
5.1 Insurance	20
5.2 Employee Agreements	20
5.3 Employee Vesting	20
5.4 Matters Requiring Investor Director Approval	21
5.5 Meetings of the Board of Directors; Committees	21
5.6 Successor Indemnification	22
5.7 Board Expenses	22
5.8 Directors' Liability and Indemnification	22
5.9 Right to Conduct Activities	23
5.10 Termination of Covenants	23

6. Miscellaneous	24
6.1 Successors and Assigns	24
6.2 Governing Law	24
6.3 Counterparts; Facsimile	24
6.4 Titles and Subtitles	24
6.5 Notices	24
6.6 Amendments and Waivers	25
6.7 Severability	25
6.8 Aggregation of Stock	26
6.9 Additional Investors	26
6.10 Entire Agreement	26
6.11 Delays or Omissions	26
6.12 Submission to Jurisdiction	26

SECOND AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT

THIS SECOND AMENDED AND RESTATED INVESTORS' RIGHTS AGREEMENT (this "**Agreement**") is made as of April 2, 2018, by and among Magenta Therapeutics, Inc., a Delaware corporation (the "**Company**"), each investor listed on Schedule A hereto, each of which is referred to in this Agreement as an "**Investor**" and collectively, the "**Investors**".

RECITALS:

WHEREAS, certain of the Investors (the "**Existing Investors**") hold shares of the Company's Series A Preferred Stock, Series B Preferred Stock and/or shares of Common Stock issued upon conversion thereof and possess registration rights, information rights, rights of first offer and other rights pursuant to an Amended and Restated Investors' Rights Agreement dated April 21, 2017 between the Company and such Investors (the "**Prior Agreement**");

WHEREAS, the Existing Investors are holders of a majority of the Registrable Securities of the Company (as defined in the Prior Agreement), and desire to amend and restate the Prior Agreement in its entirety and to accept the rights created pursuant to this Agreement in lieu of the rights granted to them under the Prior Agreement; and

WHEREAS, certain of the Investors are parties to that certain Series C Preferred Stock Purchase Agreement of even date herewith between the Company and such Investors (as the same may be amended or restated from time to time, the "**Purchase Agreement**"), under which certain of the Company's and such Investors' obligations are conditioned upon the execution and delivery of this Agreement by such Investors, Existing Investors holding a majority of the Registrable Securities, and the Company.

NOW, THEREFORE, the parties hereby agree as follows:

1. **Definitions.** For purposes of this Agreement:

1.1 "**Affiliate**" means, with respect to any specified Person, any other Person who or which, directly or indirectly, controls, is controlled by, or is under common control with such specified Person, including, without limitation, any partner, officer, director, member or employee of such specified Person and any venture capital fund now or hereafter existing that is controlled by or under common control with one or more general partners or managing members of, or shares the same management company with, such specified Person. Third Rock Ventures IV, L.P., Atlas Venture Fund X, L.P. and the Company shall not be deemed to be Affiliated for the purposes of this Agreement.

1.2 "**Board of Directors**" means the Company's Board of Directors.

1.3 "**Business Day**" means a day (i) other than Saturday or Sunday and (ii) on which commercial banks are open for business in Boston, Massachusetts.

1.4 “**Certificate of Incorporation**” means the Company’s Third Amended and Restated Certificate of Incorporation, as the same may be amended, restated or otherwise modified from time to time.

1.5 “**Common Stock**” means shares of the Company’s common stock, par value \$0.001 per share.

1.6 “**Competitor**” means a Person engaged, directly or indirectly (including through any partnership, limited liability company, corporation, joint venture or similar arrangement (whether now existing or formed hereafter)), in activities or a line of business that are directly or indirectly competitive with Company’s business as then conducted or as then proposed to be conducted, but shall not include (i) any financial investment firm or collective investment vehicle solely by virtue of its ownership (and/or its Affiliates’ ownership) of an equity interest in any Competitor held solely for investment purposes, (ii) as of the date hereof, Be The Match BioTherapies, LLC, (iii) GV 2016, L.P. or any of its affiliated funds, solely as a result of any affiliation between such fund and Alphabet Inc. (including any Affiliate of Alphabet Inc.), (iv) Casdin Partners Master Fund, LP or (v) any of the LP Investors.

1.7 “**Damages**” means any loss, damage, claim or liability (joint or several) to which a party hereto may become subject under the Securities Act, the Exchange Act, or other federal or state law, insofar as such loss, damage, claim or liability (or any action in respect thereof) arises out of or is based upon (i) any untrue statement or alleged untrue statement of a material fact contained in any registration statement of the Company, including any preliminary prospectus or final prospectus contained therein or any amendments or supplements thereto; (ii) an omission or alleged omission to state therein a material fact required to be stated therein, or necessary to make the statements therein not misleading; or (iii) any violation or alleged violation by the indemnifying party (or any of its agents or Affiliates) of the Securities Act, the Exchange Act, any state securities law, or any rule or regulation promulgated under the Securities Act, the Exchange Act, or any state securities law.

1.8 “**Deemed Liquidation Event**” shall have the meaning given to such term in the Certificate of Incorporation.

1.9 “**Derivative Securities**” means any securities or rights convertible into, or exercisable or exchangeable for (in each case, directly or indirectly), Common Stock, including options and warrants.

1.10 “**Exchange Act**” means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

1.11 “**Excluded Registration**” means (i) a registration relating to the sale of securities to employees of the Company or a subsidiary pursuant to a stock option, stock purchase, or similar plan; (ii) a registration relating to an SEC Rule 145 transaction; or (iii) a registration on any form that does not include substantially the same information as would be required to be included in a registration statement covering the sale of the Registrable Securities.

1.12 “**Form S-1**” means such form under the Securities Act as in effect on the date hereof or any successor registration form under the Securities Act subsequently adopted by the SEC.

1.13 “**Form S-3**” means such form under the Securities Act as in effect on the date hereof, any successor registration form under the Securities Act subsequently adopted by the SEC or any other registration form under the Securities Act adopted by the SEC that permits incorporation of substantial information by reference to other documents filed by the Company with the SEC.

1.14 “**GAAP**” means generally accepted accounting principles in the United States.

1.15 “**Holder**” means any holder of Registrable Securities who is a party to this Agreement.

1.16 “**Immediate Family Member**” means a child, stepchild, grandchild, parent, stepparent, grandparent, spouse, sibling, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, of a natural person referred to herein.

1.17 “**Initiating Holders**” means, collectively, Holders who properly initiate a registration request under this Agreement.

1.18 “**IPO**” means the Company’s first underwritten public offering of its Common Stock under the Securities Act.

1.19 “**Key Employee**” shall have the definition ascribed to it under the Purchase Agreement.

1.20 “**LP Investors**” means, collectively, each of PH Investments, LLC, SCubed Capital, LLC, Sobrato Family Holdings, LLC, Harvard Management Private Equity Corporation, Portland Magenta EP, LLC, Portland Magenta PIA, LLC and Fifth Avenue Private Equity 14 LLC.

1.21 “**Major Investor**” means (i) any Investor other than an LP Investor that, individually or together with such Investor’s Affiliates, holds at least 800,000 shares of Registrable Securities determined as of the date hereof (subject to appropriate adjustment in the event of any stock dividend, stock split, combination or other similar recapitalization occurring after the date of this Agreement) and (ii) each LP Investor for so long as such LP Investor holds at least fifty percent (50%) of the shares of Series C Preferred Stock held by it immediately following the Closing (as defined in the Purchase Agreement).

1.22 “**New Securities**” means, collectively, equity securities of the Company, whether or not currently authorized, as well as rights, options, or warrants to purchase such equity securities, or securities of any type whatsoever that are, or may become, convertible or exchangeable into or exercisable for such equity securities.

1.23 “**Person**” means any individual, corporation, partnership, trust, limited liability company, association or other entity.

1.24 “**Preferred Directors**” means, collectively, the Series A Directors and the Series B Director.

1.25 “**Preferred Stock**” means, collectively, the Series A Preferred Stock, the Series B Preferred Stock and the Series C Preferred Stock.

1.26 “**QPO**” shall have the meaning set forth in the Certificate of Incorporation.

1.27 “**Registrable Securities**” means (i) the Common Stock issuable or issued upon conversion of the Preferred Stock; (ii) any Common Stock, or any Common Stock issued or issuable (directly or indirectly) upon conversion and/or exercise of any other securities of the Company, held by the Major Investors or acquired by the Major Investors after the date hereof; and (iii) any Common Stock issued as (or issuable upon the conversion or exercise of any warrant, right, or other security that is issued as) a dividend or other distribution with respect to, or in exchange for or in replacement of, the shares referenced in clauses (i) and (ii) above; provided that, (A) in all cases, any Registrable Securities sold by a Person in a transaction in which the applicable rights under this Agreement are not assigned pursuant to Section 6.1 shall cease to be Registrable Securities, and (B) for purposes of Section 2, any Registrable Securities for which registration rights have terminated pursuant to Section 2.13 of this Agreement shall cease to be Registrable Securities.

1.28 “**Registrable Securities then outstanding**” means the number of shares at a point in time determined by adding the number of shares of outstanding Common Stock that are Registrable Securities at such time and the number of shares of Common Stock issuable (directly or indirectly) at such time pursuant to then exercisable and/or convertible securities that are Registrable Securities.

1.29 “**Restricted Securities**” means the securities of the Company required to bear the legend set forth in Section 2.12(b) hereof.

1.30 “**SEC**” means the Securities and Exchange Commission.

1.31 “**SEC Rule 144**” means Rule 144 promulgated by the SEC under the Securities Act, or any successor provisions.

1.32 “**SEC Rule 145**” means Rule 145 promulgated by the SEC under the Securities Act, or any successor provisions.

1.33 “**Securities Act**” means the Securities Act of 1933, as amended, and the rules and regulations promulgated thereunder.

1.34 “**Selling Expenses**” means all underwriting discounts, selling commissions, and stock transfer taxes applicable to the sale of Registrable Securities, and fees and disbursements of counsel for any Holder, except for the fees and disbursements of the Selling Holder Counsel borne and paid by the Company as provided in Section 2.6.

1.35 “**Series A Directors**” means the directors of the Company that the holders of record of the Series A Preferred Stock are entitled to elect pursuant to the Certificate of Incorporation.

1.36 “**Series B Director**” means the director of the Company that the holders of record of the Series B Preferred Stock are entitled to elect pursuant to the Certificate of Incorporation.

1.37 “**Series A Preferred Stock**” means shares of the Company’s Series A Preferred Stock, par value \$0.001 per share.

1.38 “**Series B Preferred Stock**” means shares of the Company’s Series B Preferred Stock, par value \$0.001 per share.

1.39 “**Series C Preferred Stock**” means shares of the Company’s Series C Preferred Stock, par value \$0.001 per share.

1.40 “**Stockholders Agreement**” means the Second Amended and Restated Stockholders Agreement dated as of the date hereof, by and among the Company, the Investors, and Key Holders (as defined therein), as the same may be amended, restated or otherwise modified from time to time.

2. Registration Rights. The Company covenants and agrees as follows:

2.1 Demand Registration.

(a) Form S-1 Demand. Beginning upon the earlier of (i) five (5) years after the date of this Agreement or (ii) six (6) months after the effective date of the registration statement for the IPO, if the Company receives a request from Holders of at least twenty-five percent (25%) of the Registrable Securities then outstanding that the Company file a Form S-1 registration statement with respect to at least twenty-five percent (25%) of the Registrable Securities then outstanding, having the anticipated aggregate offering amount of at least \$3.0 million, then the Company shall (x) within ten (10) days after the date such request is given, give notice thereof (the “**Demand Notice**”) to all Holders other than the Initiating Holders; and (y) as soon as practicable, and in any event within sixty (60) days after the date such request is given by the Initiating Holders, file a Form S-1 registration statement under the Securities Act covering all Registrable Securities that the Initiating Holders requested to be registered and any additional Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days after the date the Demand Notice is given, and in each case, subject to the limitations of Section 2.1(c) and Section 2.3.

(b) Form S-3 Demand. If at any time when it is eligible to use a Form S-3 registration statement, the Company receives a request from Holders of at least ten percent (10%)

of the Registrable Securities then outstanding that the Company file a Form S-3 registration statement with respect to outstanding Registrable Securities of such Holders having an anticipated aggregate offering amount, net of Selling Expenses, of at least \$1.0 million, then the Company shall (i) within ten (10) days after the date such request is given, give a Demand Notice to all Holders other than the Initiating Holders; and (ii) as soon as practicable, and in any event within forty-five (45) days after the date such request is given by the Initiating Holders, file a Form S-3 registration statement under the Securities Act covering all Registrable Securities requested to be included in such registration by any other Holders, as specified by notice given by each such Holder to the Company within twenty (20) days of the date the Demand Notice is given, and in each case, subject to the limitations of Section 2.1(c) and Section 2.3.

(c) Notwithstanding the foregoing obligations, if the Company furnishes to Holders requesting a registration pursuant to this Section 2.1 a certificate signed by the Company's chief executive officer or other most senior executive officer then in office stating that in the good faith judgment of the Board of Directors it would be materially detrimental to the Company and its stockholders for such registration statement to either become effective or remain effective for as long as such registration statement otherwise would be required to remain effective, because such action would (i) materially interfere with a significant acquisition, corporate reorganization, or other similar transaction involving the Company; (ii) require premature disclosure of material information that the Company has a bona fide business purpose for preserving as confidential; or (iii) render the Company unable to comply with requirements under the Securities Act or Exchange Act, then the Company shall have the right to defer taking action with respect to such filing, and any time periods with respect to filing or effectiveness thereof shall be tolled correspondingly, for a period of not more than one hundred twenty (120) days after the request of the Initiating Holders is given; provided, however, that the Company may not invoke this right more than once in any twelve (12) month period, nor shall the Company invoke this right more than twice in all periods; and provided further that the Company shall not register any securities for its own account or that of any other stockholder during either one hundred twenty (120) day period other than an Excluded Registration.

(d) The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Section 2.1(a) (i) if it delivers notice to the Holders within thirty (30) days after any registration request of its intent to file a registration statement for a public offering within ninety (90) days; (ii) during the period that is one hundred eighty (180) days after commencing a Company-initiated registration; (iii) after the Company has effected two (2) registrations pursuant to Section 2.1(a); or (iv) if the Initiating Holders propose to dispose of shares of Registrable Securities that may be immediately registered on Form S-3 pursuant to a request made pursuant to Section 2.1(b). The Company shall not be obligated to effect, or to take any action to effect, any registration pursuant to Section 2.1(b) if the Company has effected two (2) registrations pursuant to Section 2.1(b) within the twelve (12) month period immediately preceding the date of such request. A registration shall not be counted as "effected" for purposes of this Section 2.1(d) until such time as the applicable registration statement has been declared effective by the SEC, unless the Initiating Holders withdraw their request for such registration (other than as a result of a material adverse change to the Company), elect not to pay the registration expenses therefor, and forfeit their right to one demand registration statement pursuant to Section 2.6, in which case such withdrawn registration statement shall be counted as "effected" for purposes of this Section 2.1(d).

2.2 Company Registration. If the Company proposes to register (including, for this purpose, a registration effected by the Company for stockholders other than the Holders) any of its Common Stock under the Securities Act in connection with the public offering of such securities solely for cash (other than in an Excluded Registration), the Company shall, at such time, promptly give each Holder notice of such registration. Upon the request of each Holder given within twenty (20) days after such notice is given by the Company, the Company shall, subject to the provisions of Section 2.3, cause to be registered all of the Registrable Securities that each such Holder has requested to be included in such registration. The Company shall have the right to terminate or withdraw any registration initiated by it under this Section 2.2 before the effective date of such registration, whether or not any Holder has elected to include Registrable Securities in such registration. The expenses (other than Selling Expenses) of such withdrawn registration shall be borne by the Company in accordance with Section 2.6.

2.3 Underwriting Requirements.

(a) If, pursuant to Section 2.1, the Initiating Holders intend to distribute the Registrable Securities covered by their request by means of an underwriting, they shall so advise the Company as a part of their request made pursuant to Section 2.1, and the Company shall include such information in the Demand Notice. The underwriter(s) will be selected by the Company and shall be reasonably acceptable to a majority in interest of the Initiating Holders. In such event, the right of any Holder to include such Holder's Registrable Securities in such registration shall be conditioned upon such Holder's participation in such underwriting and the inclusion of such Holder's Registrable Securities in the underwriting to the extent provided herein. All Holders proposing to distribute their securities through such underwriting shall (together with the Company as provided in Section 2.4(e)) enter into an underwriting agreement in customary form with the underwriter(s) selected for such underwriting. Notwithstanding any other provision of this Section 2.3, if the managing underwriter(s) advise the Initiating Holders in writing that marketing factors require a limitation on the number of shares to be underwritten, then the Initiating Holders shall so advise all Holders that otherwise would be underwritten pursuant hereto, and the number of Registrable Securities that may be included in the underwriting shall be allocated among such Holders, including the Initiating Holders, in proportion (as nearly as practicable) to the number of Registrable Securities owned by each Holder, or in such other proportion as shall mutually be agreed to by all such selling Holders; provided, however, that the number of Registrable Securities held by the Holders to be included in such underwriting shall not be reduced unless all other securities are first entirely excluded from the underwriting. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest 100 shares.

(b) In connection with any offering involving an underwriting of shares of the Company's capital stock pursuant to Section 2.2, the Company shall not be required to include any of the Registrable Securities in such underwriting unless the Holders accept the terms of the underwriting as agreed upon between the Company and its underwriters, and then only in such quantity as the underwriters in their sole discretion determine will not jeopardize the success

of the offering by the Company. If the total number of securities, including Registrable Securities, requested by stockholders to be included in such offering exceeds the number of securities to be sold (other than by the Company) that the underwriters in their reasonable discretion determine is compatible with the success of the offering, then the Company shall be required to include in the offering only that number of such securities, including Registrable Securities, which the underwriters and the Company in their sole discretion determine will not jeopardize the success of the offering. If the underwriters determine that less than all of the Registrable Securities requested to be registered can be included in such offering, then the Registrable Securities that are included in such offering shall be allocated among the selling Holders in proportion (as nearly as practicable to) the number of Registrable Securities owned by each selling Holder or in such other proportions as shall mutually be agreed to by all such selling Holders. To facilitate the allocation of shares in accordance with the above provisions, the Company or the underwriters may round the number of shares allocated to any Holder to the nearest 100 shares. Notwithstanding the foregoing, in no event shall (i) the number of Registrable Securities included in the offering be reduced unless all other securities (other than securities to be sold by the Company) are first entirely excluded from the offering, or (ii) the number of Registrable Securities included in the offering be reduced below thirty percent (30%) of the total number of securities included in such offering, unless such offering is the IPO, in which case the selling Holders may be excluded further if the underwriters make the determination described above and no other stockholder's securities are included in such offering. For purposes of the provision in this Section 2.3(b) concerning apportionment, for any selling Holder that is a partnership, limited liability company, or corporation, the partners, members, retired partners, retired members, stockholders, and Affiliates of such Holder, or the estates and Immediate Family Members of any such partners, retired partners, members, and retired members and any trusts for the benefit of any of the foregoing Persons, shall be deemed to be a single "selling Holder," and any pro rata reduction with respect to such "selling Holder" shall be based upon the aggregate number of Registrable Securities owned by all Persons included in such "selling Holder," as defined in this sentence.

(c) For purposes of Section 2.1, a registration shall not be counted as "effected" if, as a result of an exercise of the underwriter's cutback provisions in Section 2.3(a) and (b), less than the total number of Registrable Securities that Holders have requested to be included in such registration statement are actually included.

2.4 Obligations of the Company.

Whenever required under this Section 2 to effect the registration of any Registrable Securities, the Company shall, as expeditiously as reasonably possible:

(a) prepare and file with the SEC a registration statement with respect to such Registrable Securities and use its commercially reasonable efforts to cause such registration statement to become effective and, upon the request of the Holders of a majority of the Registrable Securities registered thereunder, keep such registration statement effective for a period of up to one hundred twenty (120) days or, if earlier, until the distribution contemplated in the registration statement has been completed; provided, however, that (i) such one hundred twenty (120) day period shall be extended for a period of time equal to the period the Holder refrains, at the request of an underwriter of the Company, from selling any securities included in such

registration, and (ii) in the case of any registration of Registrable Securities on Form S-3 that are intended to be offered on a continuous or delayed basis, subject to compliance with applicable SEC rules, such one hundred twenty (120) day period shall be extended for up to one hundred eighty (180) days, if necessary, to keep the registration statement effective until all such Registrable Securities are sold;

(b) prepare and file with the SEC such amendments and supplements to such registration statement, and the prospectus used in connection with such registration statement, as may be necessary to comply with the Securities Act in order to enable the disposition of all securities covered by such registration statement;

(c) furnish to the selling Holders such numbers of copies of a prospectus, including a preliminary prospectus, as required by the Securities Act, and such other documents as the Holders may reasonably request in order to facilitate their disposition of their Registrable Securities;

(d) use its commercially reasonable efforts to register and qualify the securities covered by such registration statement under such other securities or blue-sky laws of such jurisdictions as shall be reasonably requested by the selling Holders; provided that the Company shall not be required to qualify to do business or to file a general consent to service of process in any such states or jurisdictions, unless the Company is already subject to service in such jurisdiction and except as may be required by the Securities Act;

(e) in the event of any underwritten public offering, enter into and perform its obligations under an underwriting agreement, in usual and customary form, with the underwriter(s) of such offering;

(f) use its commercially reasonable efforts to cause all such Registrable Securities covered by such registration statement to be listed on a national securities exchange or trading system and each securities exchange and trading system (if any) on which similar securities issued by the Company are then listed;

(g) provide a transfer agent and registrar for all Registrable Securities registered pursuant to this Agreement and provide a CUSIP number for all such Registrable Securities, in each case not later than the effective date of such registration;

(h) promptly make available for inspection by the selling Holders, any underwriter(s) participating in any disposition pursuant to such registration statement, and any attorney or accountant or other agent retained by any such underwriter or selected by the selling Holders, all financial and other records, pertinent corporate documents, and properties of the Company, and cause the Company's officers, directors, employees, and independent accountants to supply all information reasonably requested by any such seller, underwriter, attorney, accountant, or agent, in each case, as necessary or advisable to verify the accuracy of the information in such registration statement and to conduct appropriate due diligence in connection therewith;

(i) notify each selling Holder, promptly after the Company receives notice thereof, of the time when such registration statement has been declared effective or a supplement to any prospectus forming a part of such registration statement has been filed; and

(j) after such registration statement becomes effective, notify each selling Holder of any request by the SEC that the Company amend or supplement such registration statement or prospectus.

2.5 Furnish Information. It shall be a condition precedent to the obligations of the Company to take any action pursuant to this Section 2 with respect to the Registrable Securities of any selling Holder that such Holder shall furnish to the Company such information regarding itself, the Registrable Securities held by it, and the intended method of disposition of such securities as is reasonably required to effect the registration of such Holder's Registrable Securities.

2.6 Expenses of Registration. All expenses (other than Selling Expenses) incurred in connection with registrations, filings, or qualifications pursuant to Section 2, including all registration, filing, and qualification fees; printers' and accounting fees; fees and disbursements of counsel for the Company; and the reasonable fees and disbursements, not to exceed \$60,000, of one counsel for the selling Holders ("**Selling Holder Counsel**") selected by the Holders of a majority in interest of the Registrable Securities, shall be borne and paid by the Company; provided, however, that the Company shall not be required to pay for any expenses of any registration proceeding begun pursuant to Section 2.1 if the registration request is subsequently withdrawn at the request of the Holders of a majority in interest of the Registrable Securities to be registered (in which case all selling Holders shall bear such expenses pro rata based upon the number of Registrable Securities that were to be included in the withdrawn registration), unless the Holders of a majority of the Registrable Securities agree to forfeit their right to one registration pursuant to Section 2.1(a) or Section 2.1(b), as the case may be; provided further that if, at the time of such withdrawal, the Holders have learned of a material adverse change in the condition, business, or prospects of the Company from that known to the Holders at the time of their request and have withdrawn the request with reasonable promptness after learning of such information, then the Holders shall not be required to pay any of such expenses and shall not forfeit their right to one registration pursuant to Section 2.1(a) or Section 2.1(b), as the case may be. All Selling Expenses relating to Registrable Securities registered pursuant to this Section 2 shall be borne and paid by the Holders pro rata on the basis of the number of Registrable Securities registered on their behalf.

2.7 Delay of Registration. No Holder shall have any right to obtain or seek an injunction restraining or otherwise delaying any registration pursuant to this Agreement as the result of any controversy that might arise with respect to the interpretation or implementation of this Section 2.

2.8 Indemnification. If any Registrable Securities are included in a registration statement under this Section 2:

(a) To the extent permitted by law, the Company will indemnify and hold harmless each selling Holder, and the partners, members, officers, directors, and stockholders of each such Holder; legal counsel and accountants for each such Holder; any underwriter (as defined in the Securities Act) for each such Holder; and each Person, if any, who controls such Holder or underwriter within the meaning of the Securities Act or the Exchange Act, against any Damages, and the Company will pay to each such Holder, underwriter, controlling Person, or other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 2.8(a) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Company, which consent shall not be unreasonably withheld, nor shall the Company be liable for any Damages to the extent that they arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of any such Holder, underwriter, controlling Person, or other aforementioned Person expressly for use in connection with such registration.

(b) To the extent permitted by law, each selling Holder, severally and not jointly, will indemnify and hold harmless the Company, and each of its directors, each of its officers who has signed the registration statement, each Person (if any), who controls the Company within the meaning of the Securities Act, legal counsel and accountants for the Company, any underwriter (as defined in the Securities Act), any other Holder selling securities in such registration statement, and any controlling Person of any such underwriter or other Holder, against any Damages, in each case only to the extent that such Damages arise out of or are based upon actions or omissions made in reliance upon and in conformity with written information furnished by or on behalf of such selling Holder expressly for use in connection with such registration; and each such selling Holder will pay to the Company and each other aforementioned Person any legal or other expenses reasonably incurred thereby in connection with investigating or defending any claim or proceeding from which Damages may result, as such expenses are incurred; provided, however, that the indemnity agreement contained in this Section 2.8(b) shall not apply to amounts paid in settlement of any such claim or proceeding if such settlement is effected without the consent of the Holder, which consent shall not be unreasonably withheld; and provided further that in no event shall any indemnity or contribution under this Section 2.8(b) or under Section 2.8(d) exceed, in the aggregate, the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of fraud or willful misconduct by such Holder.

(c) Promptly after receipt by an indemnified party under this Section 2.8 of notice of the commencement of any action (including any governmental action) for which a party may be entitled to indemnification hereunder, such indemnified party will, if a claim in respect thereof is to be made against any indemnifying party under this Section 2.8, give the indemnifying party notice of the commencement thereof. The indemnifying party shall have the right to participate in such action and, to the extent the indemnifying party so desires, participate jointly with any other indemnifying party to which notice has been given, and to assume the defense thereof with counsel mutually satisfactory to the parties; provided, however, that an indemnified party (together with all other indemnified parties that may be represented without conflict by one counsel) shall have the right to retain one separate counsel, with the fees and expenses to be paid by the indemnifying party, if representation of such indemnified party by the

counsel retained by the indemnifying party would be inappropriate due to actual or potential differing interests between such indemnified party and any other party represented by such counsel in such action. The failure to give notice to the indemnifying party within a reasonable time of the commencement of any such action shall relieve such indemnifying party of any liability to the indemnified party under this Section 2.8, to the extent that such failure materially prejudices the indemnifying party's ability to defend such action. The failure to give notice to the indemnifying party will not relieve it of any liability that it may have to any indemnified party otherwise than under this Section 2.8.

(d) To provide for just and equitable contribution to joint liability under the Securities Act in any case in which either (i) any party otherwise entitled to indemnification hereunder makes a claim for indemnification pursuant to this Section 2.8 but it is judicially determined (by the entry of a final judgment or decree by a court of competent jurisdiction and the expiration of time to appeal or the denial of the last right of appeal) that such indemnification may not be enforced in such case, notwithstanding the fact that this Section 2.8 provides for indemnification in such case, or (ii) contribution under the Securities Act may be required on the part of any party hereto for which indemnification is provided under this Section 2.8, then, and in each such case, such parties will contribute to the aggregate losses, claims, damages, liabilities, or expenses to which they may be subject (after contribution from others) in such proportion as is appropriate to reflect the relative fault of each of the indemnifying party and the indemnified party in connection with the statements, omissions, or other actions that resulted in such loss, claim, damage, liability, or expense, as well as to reflect any other relevant equitable considerations. The relative fault of the indemnifying party and of the indemnified party shall be determined by reference to, among other things, whether the untrue or allegedly untrue statement of a material fact, or the omission or alleged omission of a material fact, relates to information supplied by the indemnifying party or by the indemnified party and the parties' relative intent, knowledge, access to information, and opportunity to correct or prevent such statement or omission; provided, however, that, in any such case, (x) no Holder will be required to contribute any amount in excess of the public offering price of all such Registrable Securities offered and sold by such Holder pursuant to such registration statement, and (y) no Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) will be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation; and provided further that in no event shall a Holder's liability pursuant to this Section 2.8(d), when combined with the amounts paid or payable by such Holder pursuant to Section 2.8(b), exceed the proceeds from the offering received by such Holder (net of any Selling Expenses paid by such Holder), except in the case of willful misconduct or fraud by such Holder.

(e) Notwithstanding the foregoing, to the extent that the provisions on indemnification and contribution contained in the underwriting agreement entered into in connection with the underwritten public offering are in conflict with the foregoing provisions, the provisions in the underwriting agreement shall control.

(f) Unless otherwise superseded by an underwriting agreement entered into in connection with the underwritten public offering, the obligations of the Company and Holders under this Section 2.8 shall survive the completion of any offering of Registrable Securities in a registration under this Section 2, and otherwise shall survive the termination of this Agreement.

2.9 Reports under Exchange Act. With a view to making available to the Holders the benefits of SEC Rule 144 and any other rule or regulation of the SEC that may at any time permit a Holder to sell securities of the Company to the public without registration or pursuant to a registration on Form S-3, the Company shall:

(a) make and keep available adequate current public information, as those terms are understood and defined in SEC Rule 144, at all times after the effective date of the registration statement filed by the Company for the IPO;

(b) use commercially reasonable efforts to file with the SEC in a timely manner all reports and other documents required of the Company under the Securities Act and the Exchange Act (at any time after the Company has become subject to such reporting requirements); and

(c) furnish to any Holder, so long as the Holder owns any Registrable Securities, forthwith upon request (i) to the extent accurate, a written statement by the Company that it has complied with the reporting requirements of SEC Rule 144 (at any time after ninety (90) days after the effective date of the registration statement filed by the Company for the IPO), the Securities Act, and the Exchange Act (at any time after the Company has become subject to such reporting requirements), or that it qualifies as a registrant whose securities may be resold pursuant to Form S-3 (at any time after the Company so qualifies); (ii) a copy of the most recent annual or quarterly report of the Company and such other reports and documents so filed by the Company; and (iii) such other information as may be reasonably requested in availing any Holder of any rule or regulation of the SEC that permits the selling of any such securities without registration (at any time after the Company has become subject to the reporting requirements under the Exchange Act) or pursuant to Form S-3 (at any time after the Company so qualifies to use such form).

2.10 Limitations on Subsequent Registration Rights. From and after the date of this Agreement, the Company shall not, without the prior written consent of the Holders of a majority in interest of the Registrable Securities then outstanding, enter into any agreement with any holder or prospective holder of any securities of the Company that would allow such holder or prospective holder (i) to include such securities in any registration unless, under the terms of such agreement, such holder or prospective holder may include such securities in any such registration only to the extent that the inclusion of such securities will not reduce the number of the Registrable Securities of the Holders that are included or (ii) to demand registration of any securities held by such holder or prospective holder; provided that this limitation shall not apply to any additional Investor who becomes a party to this Agreement in accordance with Section 6.9.

2.11 "Market Stand-off" Agreement.

Each Holder hereby agrees that, if required by the managing underwriter, it will not, during the period commencing on the date of the final prospectus relating to the IPO and ending on the date specified by the Company and the managing underwriter (such period not to exceed one

hundred eighty (180) days), or such other period as may be requested by the Company or an underwriter to accommodate regulatory restrictions on (1) the publication or other distribution of research reports, and (2) analyst recommendations and opinions, including, but not limited to, the restrictions contained in FINRA Rule 2711(f)(4) or NYSE Rule 472(f)(4), or any successor provisions or amendments thereto) (i) lend; offer; pledge; sell; contract to sell; sell any option or contract to purchase; purchase any option or contract to sell; grant any option, right, or warrant to purchase; or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable (directly or indirectly) for Common Stock held immediately before the effective date of the registration statement for such offering or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of such securities, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or other securities, in cash, or otherwise. The foregoing provisions of this Section 2.11 shall apply only to the IPO, shall not apply to the sale of any shares to an underwriter pursuant to an underwriting agreement, and shall be applicable to the Holders only if all officers, directors, and stockholders individually owning more than one percent (1%) of the Company's outstanding Common Stock (after giving effect to conversion into Common Stock of all outstanding Preferred Stock) are subject to the same restrictions. The underwriters in connection with such registration are intended third-party beneficiaries of this Section 2.11 and shall have the right, power, and authority to enforce the provisions hereof as though they were a party hereto. Each Holder further agrees to execute such agreements as may be reasonably requested by the underwriters in connection with such registration that are consistent with this Section 2.11 or that are necessary to give further effect thereto. The Company agrees to use its reasonable efforts to obtain the agreement of the managing underwriter to periodic early releases of portions of the securities subject to such lock-up agreements upon the request of a Holder to such early release, provided that in the event of any early release, all Holders will be released on a pro rata basis from such agreements. Any discretionary waiver or termination of the restrictions of any or all of such agreements by the Company or the underwriters shall apply pro rata to all Holders subject to such agreements, based on the number of shares subject to such agreements.

2.12 Restrictions on Transfer.

(a) The Preferred Stock and the Registrable Securities shall not be sold, pledged, or otherwise transferred, and the Company shall not recognize any such sale, pledge, or transfer, except upon the conditions specified in this Agreement, which conditions are intended to ensure compliance with the provisions of the Securities Act. A transferring Holder will cause any proposed purchaser, pledgee, or transferee of the Preferred Stock or the Registrable Securities held by such Holder to agree to take and hold such securities subject to the provisions and upon the conditions specified in this Agreement.

(b) Each certificate or instrument representing (i) the Preferred Stock, (ii) the Registrable Securities, and (iii) any other securities issued in respect of the securities referenced in clauses (i) and (ii), upon any stock split, stock dividend, recapitalization, merger, consolidation, or similar event, shall (unless otherwise permitted by the provisions of Section 2.12(c)) be stamped or otherwise imprinted with a legend substantially in the following form:

THE SECURITIES REPRESENTED HEREBY HAVE BEEN ACQUIRED FOR INVESTMENT AND HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933, AS AMENDED. SUCH SHARES MAY NOT BE SOLD, PLEDGED, OR TRANSFERRED IN THE ABSENCE OF SUCH REGISTRATION OR A VALID EXEMPTION FROM THE REGISTRATION AND PROSPECTUS DELIVERY REQUIREMENTS OF SAID ACT.

THE SECURITIES REPRESENTED HEREBY MAY BE TRANSFERRED ONLY IN ACCORDANCE WITH THE TERMS OF AN AGREEMENT BETWEEN THE COMPANY AND THE STOCKHOLDER, A COPY OF WHICH IS ON FILE WITH THE SECRETARY OF THE COMPANY.

The Holders consent to the Company making a notation in its records and giving instructions to any transfer agent of the Restricted Securities in order to implement the restrictions on transfer set forth in this Section 2.12.

(c) The holder of each certificate or instrument representing Restricted Securities, by acceptance thereof, agrees to comply in all respects with the provisions of this Section 2. Before any proposed sale, pledge, or transfer of any Restricted Securities, unless there is in effect a registration statement under the Securities Act covering the proposed transaction, the Holder thereof shall give notice to the Company of such Holder's intention to effect such sale, pledge, or transfer. Each such notice shall describe the manner and circumstances of the proposed sale, pledge, or transfer in sufficient detail and, if reasonably requested by the Company, shall be accompanied at such Holder's expense by either (i) a written opinion of legal counsel who shall, and whose legal opinion shall, be reasonably satisfactory to the Company, addressed to the Company, to the effect that the proposed transaction may be effected without registration under the Securities Act; (ii) a "no action" letter from the SEC to the effect that the proposed sale, pledge, or transfer of such Restricted Securities without registration will not result in a recommendation by the staff of the SEC that action be taken with respect thereto; or (iii) any other evidence reasonably satisfactory to counsel to the Company to the effect that the proposed sale, pledge, or transfer of the Restricted Securities may be effected without registration under the Securities Act, whereupon the Holder of such Restricted Securities shall be entitled to sell, pledge, or transfer such Restricted Securities in accordance with the terms of the notice given by the Holder to the Company. The Company will not require such a legal opinion or "no action" letter (x) in any transaction in which such Holder distributes Restricted Securities to an Affiliate of such Holder for no consideration provided that each transferee agrees in writing to be subject to the terms of this Section 2.12 or (y) in any transaction in compliance with SEC Rule 144. Each certificate or instrument evidencing the Restricted Securities transferred as above provided shall bear, except if such transfer is made pursuant to SEC Rule 144, the appropriate restrictive legend set forth in Section 2.12(b), except that such certificate shall not bear such restrictive legend if, in the opinion of counsel for such Holder and the Company, such legend is not required in order to establish compliance with any provisions of the Securities Act.

2.13 Termination of Registration Rights. The right of any Holder to request registration or inclusion of Registrable Securities in any registration pursuant to Section 2.1 or Section 2.2 shall terminate upon the earliest to occur of:

(a) the closing of a Deemed Liquidation Event, as such term is defined in the Certificate of Incorporation;

(b) such time as Rule 144 or another similar exemption under the Securities Act is available for the sale of all of such Holder's shares without limitation during a three-month period without registration; and

(c) the fifth (5th) anniversary of the IPO.

3. Information.

3.1 Delivery of Financial Statements. The Company shall deliver to each Major Investor the required items listed below, provided that the Board of Directors has not reasonably determined that such Major Investor is a Competitor of the Company.

(a) as soon as practicable, but in any event within one hundred twenty (120) days after the end of each fiscal year of the Company, (i) a balance sheet as of the end of such year, (ii) statements of income and of cash flows for such year, and (iii) a statement of stockholders' equity as of the end of such year, all such financial statements audited and certified by independent public accountants of nationally or regionally recognized standing selected by the Company and approved by the Board of Directors;

(b) as soon as practicable but in any event within forty-five (45) days after the end of each quarter of each fiscal year of the Company, unaudited statements of income and of cash flows for such fiscal quarter, and an unaudited balance sheet and a statement of stockholders' equity as of the end of such fiscal quarter, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end audit adjustments and (ii) not contain all notes thereto that may be required in accordance with GAAP);

(c) as soon as practicable, but in any event within thirty (30) days after the end of each month, an unaudited income statement and statement of cash flows for such month, and an unaudited balance sheet and statement of stockholders' equity as of the end of such month, all prepared in accordance with GAAP (except that such financial statements may (i) be subject to normal year-end audit adjustments and (ii) not contain all notes thereto that may be required in accordance with GAAP);

(d) as soon as practicable, but in any event within forty-five (45) days after the end of each quarter of each fiscal year of the Company, a statement showing the number of shares of each class and series of capital stock and securities convertible into or exercisable for shares of capital stock outstanding at the end of the period, the Common Stock issuable upon conversion or exercise of any outstanding securities convertible or exercisable for Common Stock and the exchange ratio or exercise price applicable thereto, and the number of shares of issued stock options and stock options not yet issued but reserved for issuance, if any, all in sufficient detail as to permit each Major Investor to calculate their respective percentage equity ownership in the Company, and certified by the chief financial officer or chief executive officer of the Company as being true, complete, and correct;

(e) as soon as practicable, but in any event thirty (30) days before the end of each fiscal year, a budget and business plan for the next fiscal year (collectively, the “**Budget**”), approved by the Board of Directors and prepared on a monthly basis, including balance sheets, income statements, and statements of cash flow for such months and, promptly after prepared, any other budgets or revised budgets prepared by the Company; and

(f) such other information relating to the financial condition, business, prospects, or corporate affairs of the Company as any Major Investor may from time to time reasonably request; provided, however, that the Company shall not be obligated under this Section 3.1 to provide information (i) that the Company reasonably determines in good faith to be a trade secret or highly confidential information (unless covered by an enforceable confidentiality agreement, in a form reasonably acceptable to the Company); or (ii) the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

If, for any period, the Company has any subsidiary whose accounts are consolidated with those of the Company, then in respect of such period the financial statements delivered pursuant to the foregoing sections shall be the consolidated and consolidating financial statements of the Company and all such consolidated subsidiaries.

Notwithstanding anything else in this Section 3.1 to the contrary, the Company may cease providing the information set forth in this Section 3.1 during the period starting with the date thirty (30) days before the Company’s good-faith estimate of the date of filing of a registration statement if it reasonably concludes it must do so to comply with the SEC rules applicable to such registration statement and related offering; provided that the Company’s covenants under this Section 3.1 shall be reinstated at such time as the Company is no longer actively employing its commercially reasonable efforts to cause such registration statement to become effective.

3.2 Inspection. The Company shall permit each Major Investor (provided that such Major Investor is not a Competitor of the Company as reasonably determined by the Board of Directors), at such Major Investor’s expense, to visit and inspect the Company’s properties; examine its books of account and records; and discuss the Company’s affairs, finances, and accounts with its officers, during normal business hours of the Company as may be reasonably requested by the Major Investor; provided, however, that the Company shall not be obligated pursuant to this Section 3.2 to provide access to any information that it reasonably and in good faith considers to be a trade secret or confidential information (unless covered by an enforceable confidentiality agreement, in a form acceptable to the Company); or the disclosure of which would adversely affect the attorney-client privilege between the Company and its counsel.

3.3 Termination of Information Rights. The covenants set forth in Sections 3.1 and 3.2 shall terminate and be of no further force or effect upon the earliest to occur of (i) immediately before, but subject to, the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act, or (iii) upon a Deemed Liquidation Event resulting in proceeds to the Investors paid solely in cash or publicly traded securities on a nationally recognized securities exchange or marketplace (e.g., the New York Stock Exchange and the Nasdaq Stock Market).

3.4 Confidentiality. Each Investor agrees that such Investor will keep confidential and will not disclose, divulge, or use for any purpose (other than to monitor its investment in the Company) any confidential information obtained from the Company pursuant to the terms of this Agreement (including notice of the Company's intention to file a registration statement), unless such confidential information (a) is known or becomes known to the public in general (other than as a result of a breach of this Section 3.4 by such Investor), (b) is or has been independently developed or conceived by the Investor without use of the Company's confidential information, or (c) is or has been made known or disclosed to the Investor by a third party without a breach of any obligation of confidentiality such third party may have to the Company; provided, however, that an Investor may disclose confidential information (i) to its attorneys, accountants, consultants, advisors and other professionals (collectively, "**Representatives**") to the extent necessary to obtain their services in connection with monitoring its investment in the Company; (ii) to any prospective purchaser of any Registrable Securities from such Investor, if such prospective purchaser agrees to be bound by the provisions of this Section 3.4; (iii) in the ordinary course of business to any existing or prospective, direct or indirect, Affiliate, partner, member, stockholder, or wholly owned subsidiary of such Investor and any Representatives, employees or Affiliates of any of the foregoing, provided that such Investor informs any such recipient that such information is confidential and directs such recipient to maintain the confidentiality of such information (each of the foregoing Persons, a "**Permitted Disclosee**"); or (iv) as may otherwise be required by law or securities exchange regulations or at the request of a regulatory authority, provided that the Investor promptly notifies the Company of such disclosure and takes reasonable steps to minimize the extent of any such required disclosure. Furthermore, nothing contained herein shall prevent any Investor or any Permitted Disclosee from entering into any business, entering into any agreement with a third party, or investing in or engaging in investment discussions with any other company (whether or not competitive with the Company), provided that such Investor or Permitted Disclosee does not, except as permitted in accordance with this Section 3.4, disclose any proprietary or confidential information of the Company in connection with such activities; and provided further, each Investor may identify the Company and the value of such Investor's security holdings in the Company in accordance with applicable investment reporting and disclosure regulations or internal policies and respond to routine examinations, demands, requests or reporting requirements of any regulator without prior notice to or consent from the Company.

4. Rights to Future Stock Issuances.

4.1 Right of First Offer. Subject to the terms and conditions of this Section 4.1 and applicable securities laws, if the Company proposes to offer or sell any New Securities, the Company shall first offer such New Securities to each Major Investor, provided that the Board of Directors has not reasonably determined that such Major Investor is a Competitor of the Company. A Major Investor shall be entitled to apportion the right of first offer hereby granted to it among itself and its Affiliates in such proportions as it deems appropriate, provided that each such Affiliate (x) is not a Competitor of the Company as reasonably determined by the Board of Directors, and (y) agrees to enter into this Agreement and the Stockholders Agreement of even date herewith among the Company, the Investors and the other parties named therein, as an "Investor" under each such agreement.

(a) The Company shall give notice (the “**Offer Notice**”) to each Major Investor, stating (i) its bona fide intention to offer such New Securities, (ii) the number of such New Securities to be offered, and (iii) the price and terms, if any, upon which it proposes to offer such New Securities.

(b) By notification to the Company within twenty (20) days after the Offer Notice is given, each Major Investor may elect to purchase or otherwise acquire, at the price and on the terms specified in the Offer Notice, up to that portion of such New Securities which equals the proportion that the Common Stock then held by such Major Investor (including all shares of Common Stock then issuable (directly or indirectly) upon conversion and/or exercise, as applicable, of the Preferred Stock and any other Derivative Securities then held by such Major Investor) bears to the total number of shares of Common Stock of the Company then outstanding (assuming full conversion and/or exercise, as applicable, of all Preferred Stock and other Derivative Securities). At the expiration of such twenty (20) day period, the Company shall promptly notify each Major Investor that elects to purchase or acquire all the shares available to it (each, a “**Fully Exercising Investor**”) of any other Major Investor’s failure to do likewise. During the ten (10) day period commencing after the Company has given such notice, each Fully Exercising Investor may, by giving notice to the Company, elect to purchase or acquire, in addition to the number of shares specified above, up to that portion of the New Securities for which such Major Investors were entitled to subscribe, but that were not subscribed for by the Major Investors, which is equal to the proportion that the Common Stock issued and held, or issuable upon conversion of Preferred Stock and any other Derivative Securities then held, by such Fully Exercising Investor bears to the number of shares of Common Stock issued and held, or issuable (directly or indirectly) upon conversion of the Preferred Stock and any other Derivative Securities then held, by all Fully Exercising Investors who wish to purchase such unsubscribed shares. The closing of any sale pursuant to this Section 4.1(b) shall occur within the later of one hundred twenty (120) days after the date that the Offer Notice is given and the date of initial sale of New Securities pursuant to Section 4.1(c).

(c) If fewer than all New Securities referred to in the Offer Notice are elected to be purchased or acquired as provided in Section 4.1(b), the Company may, during the ninety (90) day period following the expiration of the periods provided in Section 4.1(b), offer and sell the remaining unsubscribed portion of such New Securities to any Person or Persons at a price not less than, and upon terms no more favorable to the offeree than, those specified in the Offer Notice. If the Company does not enter into an agreement for the sale of the New Securities within such period, or if such agreement is not consummated within thirty (30) days of the execution thereof, the right provided hereunder shall be deemed to be revived and such New Securities shall not be offered unless first reoffered to the Major Investors in accordance with this Section 4.1.

(d) The right of first offer in this Section 4.1 shall not be applicable to (i) Exempted Securities (as defined in the Certificate of Incorporation), (ii) any shares of Series C Preferred Stock sold pursuant to the Purchase Agreement, and (iii) shares of Common Stock issued in the IPO.

(e) The rights of the Major Investors to purchase New Securities under this Section 4.1 may be modified or waived in accordance with Section 6.6; provided, however,

that in the event such rights to purchase New Securities under this Section 4.1 are waived and any Major Investor(s) purchase New Securities, the Company shall give notice to the other Major Investors within thirty (30) days after the initial issuance of New Securities. Such notice shall describe the type, price, and terms of the New Securities. Each such other Major Investor shall have twenty (20) days from the date such notice is given to elect to purchase on similar terms and conditions in a subsequent closing up to the number of New Securities that would, if purchased by such Major Investor, maintain such Major Investor's percentage-ownership position, calculated as set forth in Section 4.1(b) before giving effect to the issuance of such New Securities.

4.2 Termination. The covenants set forth in Section 4.1 shall terminate and be of no further force or effect upon the earliest to occur of (i) immediately before, but subject to, the consummation of the IPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act with its Common Stock listed on the NYSE or NASDAQ or (iii) upon a Deemed Liquidation Event.

5. Additional Covenants.

5.1 Insurance. The Company has obtained, or shall obtain within 90 days of the date of this Agreement, from financially sound and reputable insurers Directors and Officers Errors and Omissions insurance in an amount satisfactory to the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, and will use commercially reasonable efforts to cause such insurance policy to be maintained until such time as the Board of Directors (including the affirmative vote of all of the Preferred Directors then serving on the Board of Directors) determines that such insurance should be discontinued.

5.2 Employee Agreements. The Company will cause (a) each individual now or hereafter employed by it or by any subsidiary (or engaged by the Company or any subsidiary as an individual consultant/independent contractor) with access to confidential information and/or trade secrets to enter into a nondisclosure and proprietary rights assignment agreement and (b) each Key Employee or Intellectual Property Employee (as defined in the Purchase Agreement) to enter into a one (1) year noncompetition and nonsolicitation agreement, substantially in the form approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors. In addition, the Company shall not amend, modify, terminate, waive, or otherwise alter, in whole or in part, any of the above-referenced agreements or any restricted stock agreement between the Company and any employee, without the approval by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors.

5.3 Employee Vesting. Unless otherwise approved by the Board of Directors, which approval shall include a majority of the Preferred Directors then serving on the Board of Directors, all current and future employees and consultants of the Company who purchase, receive options to purchase, or receive awards of shares of the Company's capital stock after the date hereof shall be required to execute restricted stock or option agreements, as applicable, providing for (a) vesting of shares, not faster than over a four (4) year period, with the first twenty-five percent (25%) of such shares vesting following twelve (12) months of continued employment or service, and the remaining shares vesting in equal quarterly installments over

the following three (3) years, and (b) a market stand-off provision substantially similar to that in Section 2.11. In addition, unless otherwise approved by the Board of Directors, including a majority of the Preferred Directors then serving on the Board of Directors, the Company shall retain a “right of first refusal” on employee transfers of shares of Common Stock until the Company’s IPO and shall have the right to repurchase unvested shares at cost upon termination of employment of a holder of restricted stock.

5.4 Matters Requiring Investor Director Approval. So long as any shares of Preferred Stock remain outstanding, the Company hereby covenants and agrees with each of the Investors that it shall not, without first obtaining the approval of the Board of Directors, which approval must include the affirmative vote of a majority of the Preferred Directors then serving on the Board of Directors:

(a) make, or permit any subsidiary to make, any loan or advance to, or own any stock or other securities of, any subsidiary or other corporation, partnership, or other entity unless it is wholly owned by the Company;

(b) create any subsidiary;

(c) make, or permit any subsidiary to make, any loan or advance to any Person, including, without limitation, any employee or director of the Company or any subsidiary, except advances and similar expenditures in the ordinary course of business or under the terms of an employee stock or option plan approved by the Board of Directors;

(d) guarantee, directly or indirectly, or permit any subsidiary to guarantee, directly or indirectly, any indebtedness except for trade accounts of the Company or any subsidiary arising in the ordinary course of business;

(e) make any investment inconsistent with any investment policy approved by the Board of Directors;

(f) incur indebtedness in excess of \$200,000 in the aggregate that is not covered by the Budget, other than trade credit incurred in the ordinary course of business;

(g) otherwise enter into or be a party to any transaction with any director, officer or employee of the Company or any “associate” (as defined in Rule 12b-2 promulgated under the Exchange Act) of any such Person;

(h) hire, terminate, or change the compensation of the executive officers, including approving any option grants or stock awards to executive officers; or

(i) change the principal business of the Company, or enter into a new line of business, or exit the existing line of business of the Company.

5.5 Meetings of the Board of Directors; Committees. Unless otherwise determined by the vote of at least a majority of the directors then in office, the Board of Directors shall meet at least four (4) times per year, and at least once per quarter, in accordance with an agreed-upon schedule. Each non-employee director shall be entitled in such person’s discretion to be a member of any committee of the Board of Directors.

5.6 Successor Indemnification. If the Company or any of its successors or assignees consolidates with or merges into any other Person and is not the continuing or surviving corporation or entity of such consolidation or merger, then to the extent necessary, proper provision shall be made so that the successors and assignees of the Company assume the obligations of the Company with respect to indemnification of members of the Board of Directors as in effect immediately before such transaction, whether such obligations are contained in the Company's By-laws, the Certificate of Incorporation, or elsewhere, as the case may be.

5.7 Board Expenses. The Company shall reimburse the non-employee directors for all reasonable out-of-pocket expenses incurred (consistent with the Company's policies) in connection with their role as a director of the Company.

5.8 Directors' Liability and Indemnification.

(a) The Certificate of Incorporation and By-laws (as such By-laws of the Company may be amended from time to time) shall provide (i) for limitation of the liability of directors to the maximum extent permitted by law, and (ii) for indemnification of directors for acts on behalf of the Company to the maximum extent permitted by law. In the event any suit is filed or claim is asserted against a director or former director of the Company as a result of such director's or former director's service on the Board of Directors, the Company will provide such director or former director access to all records and files of the Company as he or she may reasonably request in defending against or preparing to defend against any such suit or claim.

(b) The Company hereby acknowledges that one or more of the Preferred Directors may have certain rights to indemnification, advancement of expenses and/or insurance provided by one or more of the Investors and certain of their Affiliates (collectively, the "**Fund Indemnitors**") for alleged acts or omissions in their capacities as directors of the Company. The Company hereby agrees (i) that it is the indemnitor of first resort (i.e., its obligations to any such director are primary and any obligation of the Fund Indemnitors to advance expenses or to provide indemnification for the same expenses or liabilities incurred by such director are secondary), (ii) that it shall be required to advance the full amount of expenses incurred by such director and shall be liable for the full amount of all expenses, judgments, penalties, fines and amounts paid in settlement by or on behalf of any such director to the extent legally permitted and as required by the Certificate of Incorporation or By-laws of the Company (or any agreement between the Company and such director), without regard to any rights such director may have against the Fund Indemnitors, and, (iii) that it irrevocably waives, relinquishes and releases the Fund Indemnitors from any and all claims against the Fund Indemnitors for contribution, subrogation or any other recovery of any kind in respect thereof. The Company further agrees that no advancement or payment by the Fund Indemnitors on behalf of any such director with respect to any claim for which such director has sought indemnification from the Company shall affect the foregoing and the Fund Indemnitors shall have a right of contribution and/or be subrogated to the extent of such advancement or payment to all of the rights of recovery of such director against the Company.

5.9 Right to Conduct Activities. The Company hereby agrees and acknowledges that each of Third Rock Ventures IV, L.P., Atlas Venture Fund X, L.P., GV 2016, L.P., Partners Innovation Fund LLC, Be The Match BioTherapies, LLC, Access Industries Holdings LLC, Casdin Partners Master Fund, LP and each LP Investor (in each case, together with its Affiliates) and funds advised by Eventide Asset Management (each, collectively, an “**Investing Entity**”) invests in or may hereafter invest in one or more other portfolio companies (“**PortCos**”), some of which may be deemed competitive with the Company’s business (as currently conducted or as currently proposed to be conducted). The Company hereby agrees that (a) no Investing Entity shall be deemed to be a Competitor of the Company in respect of any investment such Investing Entity makes in any PortCo, and (b) to the extent permitted under applicable law, no Investing Entity shall be liable to the Company for any claim arising out of, or based upon, (i) the investment by such Investing Entity in any entity competitive with the Company, or (ii) actions taken by any partner, officer or other representative of such Investing Entity to assist any such competitive company, whether or not such action was taken as a member of the board of directors of such competitive company or otherwise, and whether or not such action has a detrimental effect on the Company; provided, however, that the foregoing shall not relieve (x) any of the Investors from liability associated with the unauthorized disclosure of the Company’s confidential information obtained pursuant to this Agreement, or (y) any director or officer of the Company from any liability associated with his or her fiduciary duties to the Company.

5.10 ERISA Matters. The Company will exercise its reasonable best efforts to ensure that, at all times during which any Purchaser holds any Preferred Stock or Common Stock, the assets of the Company will not be deemed to be “plan assets” for purposes of Employee Retirement Income Security Act of 1974 (“ERISA”). The Company agrees to provide notice, in writing, to each Purchaser as soon as is reasonably practicable upon determining that the assets of the Company are reasonably likely to be deemed “plan assets” for purposes of ERISA.

5.11 Publicity. The Company may not make use of any Investor’s name on its website, via press release or other similar communication without the prior consent of such Investor, which consent may be delivered to the Company via email.

5.12 Termination of Covenants. The covenants set forth in this Section 5, except for Sections 5.6 and 5.8, shall terminate and be of no further force or effect upon the earliest to occur of (i) immediately before but subject to the consummation of a QPO, (ii) when the Company first becomes subject to the periodic reporting requirements of Section 12(g) or 15(d) of the Exchange Act with its Common Stock listed on the NYSE or NASDAQ, or (iii) upon a Deemed Liquidation Event.

6. Miscellaneous.

6.1 Successors and Assigns. The rights under this Agreement may be assigned (but only with all related obligations) by a Holder to a transferee of Registrable Securities that (i) is an Affiliate, member, retired partner, retired member or stockholder of a Holder; (ii) is a Holder's Immediate Family Member or trust for the benefit of an individual Holder or one or more of such Holder's Immediate Family Members; or (iii) after such transfer, holds at least 50,000 shares of Registrable Securities (subject to appropriate adjustment for stock splits, stock dividends, combinations, and other recapitalizations); provided, however, that (x) the Company is, within a reasonable time after such transfer, furnished with written notice of the name and address of such transferee and the Registrable Securities with respect to which such rights are being transferred; and (y) such transferee agrees in a written instrument delivered to the Company to be bound by and subject to the terms and conditions of this Agreement, including the provisions of Section 2.11. For the purposes of determining the number of shares of Registrable Securities held by a transferee, the holdings of a transferee (1) that is an Affiliate, limited partner, retired partner, member, retired member, or stockholder of a Holder; (2) who is a Holder's Immediate Family Member; or (3) that is a trust for the benefit of an individual Holder or such Holder's Immediate Family Member shall be aggregated together and with those of the transferring Holder and its Affiliates; provided further that all transferees who would not qualify individually for assignment of rights shall have a single attorney-in-fact for the purpose of exercising any rights, receiving notices, or taking any action under this Agreement. The terms and conditions of this Agreement inure to the benefit of and are binding upon the respective successors and permitted assignees of the parties, including without limitation, the Investor's Affiliates. Nothing in this Agreement, express or implied, is intended to confer upon any party other than the parties hereto or their respective successors and permitted assignees any rights, remedies, obligations or liabilities under or by reason of this Agreement, except as expressly provided herein.

6.2 Governing Law. This Agreement shall be governed by and construed in accordance with the internal laws of the State of Delaware, without regard to conflict of law principles that would result in the application of any law other than the law of the State of Delaware.

6.3 Counterparts; Facsimile. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. This Agreement may also be executed and delivered by facsimile signature, email signature, or other form of electronic transmission.

6.4 Titles and Subtitles. The titles and subtitles used in this Agreement are for convenience only and are not to be considered in construing or interpreting this Agreement.

6.5 Notices. All notices and other communications given or made pursuant to this Agreement shall be in writing and shall be deemed effectively given: (a) upon personal delivery to the party to be notified; (b) when sent, if sent by confirmed electronic mail or facsimile and sent during normal business hours of the recipient, and if not so confirmed, then on the next Business Day; (c) five (5) days after having been sent by registered or certified mail,

return receipt requested, postage prepaid; or (d) one (1) Business Day after the Business Day of deposit with a nationally recognized overnight courier, freight prepaid, specifying next Business Day delivery, with written verification of receipt. All communications shall be sent to the respective parties at their addresses as set forth on Schedule A hereto, or to the principal office of the Company and to the attention of the Chief Executive Officer, in the case of the Company, or to such email address, facsimile number, or address as subsequently modified by written notice given in accordance with this Section 6.5. If notice is given to the Company, a copy, which shall not constitute notice, shall also be sent to Mitchell S. Bloom and William D. Collins at Goodwin Procter LLP, 100 Northern Avenue, Boston, MA 02210.

6.6 Amendments and Waivers. Any term of this Agreement may be amended and the observance of any term of this Agreement may be waived (either generally or in a particular instance, and either retroactively or prospectively) only with the written consent of the Company and the holders of at least sixty percent (60%) of the Registrable Securities then outstanding; provided that the Company may in its sole discretion waive compliance with Section 2.12(c) (and the Company's failure to object promptly in writing after notification of a proposed assignment allegedly in violation of Section 2.12(c) shall be deemed to be a waiver); and provided further that any provision hereof may be waived by any waiving party on such party's own behalf, without the consent of any other party. Notwithstanding the foregoing, (i) this Agreement may not be amended or terminated and the observance of any term hereof may not be waived with respect to any Investor without the written consent of such Investor, unless such amendment, termination, or waiver applies to all Investors in the same fashion, (ii) any waiver of the provisions of Section 4 shall be effective only if all Major Investors that have rights under Section 4 are provided the opportunity to participate in such offering to the same extent (on a percentage basis) of their pro rata share and on similar terms as the other Major Investors who are participating in such offering (including, but not limited to, through a rights offering completed in accordance with the procedures set forth in Section 4.1(e)), and (iii) the provisions of Section 3 and Section 4 may be amended and the observance of any term thereof may be waived (either generally or in a particular instance and either retroactively or prospectively) only with the written consent of the Major Investors holding at least sixty percent (60%) of the Registrable Securities then held by all Major Investors. The Company shall give prompt notice of any amendment or termination hereof or waiver hereunder to any party hereto that did not consent in writing to such amendment, termination, or waiver. Any amendment, termination, or waiver effected in accordance with this Section 6.6 shall be binding on all parties hereto, regardless of whether any such party has consented thereto. No waivers of or exceptions to any term, condition, or provision of this Agreement, in any one or more instances, shall be deemed to be or construed as a further or continuing waiver of any such term, condition, or provision.

6.7 Severability. In case any one or more of the provisions contained in this Agreement is for any reason held to be invalid, illegal or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision of this Agreement, and such invalid, illegal, or unenforceable provision shall be reformed and construed so that it will be valid, legal, and enforceable to the maximum extent permitted by law.

6.8 Aggregation of Stock. All shares of Registrable Securities held or acquired by Affiliates shall be aggregated together for the purpose of determining the availability of any rights under this Agreement and such Affiliated Person may apportion such rights as among themselves in any manner they deem appropriate.

6.9 Additional Investors. Notwithstanding anything to the contrary contained herein, if after the date hereof the Company issues additional shares of the Preferred Stock to a Person who is not already a party to this Agreement (any such person, a “**New Investor**”), as a condition to the issuance of such shares the Company shall require that such New Investor become a party to this Agreement by executing and delivering a counterpart signature page or joinder agreement to this Agreement, and thereafter shall be deemed an “Investor” for all purposes hereunder. No action or consent by the Investors shall be required for such joinder to this Agreement by such additional Investor, so long as such additional Investor has agreed in writing to be bound by all of the obligations as an “Investor” hereunder. Schedule A to this Agreement shall be updated, as applicable, to reflect the issuance of Preferred Stock and Common Stock, respectively, to a New Investor.

6.10 Entire Agreement. Upon effectiveness of this Agreement, the Prior Agreement shall be deemed amended and restated to read in its entirety as set forth in this Agreement. This Agreement (including the Schedules hereto) constitutes the full and entire understanding and agreement between the parties with respect to the subject matter hereof, and any other written or oral agreement relating to the subject matter hereof existing between the parties (including the Prior Agreement) are expressly canceled.

6.11 Delays or Omissions. Except as set forth in Section 2.1(c) (with respect to the Company’s failure to object promptly to a transfer), no delay or omission to exercise any right, power, or remedy accruing to any party under this Agreement, upon any breach or default of any other party under this Agreement, shall impair any such right, power, or remedy of such nonbreaching or nondefaulting party, nor shall it be construed to be a waiver of or acquiescence to any such breach or default, or to any similar breach or default thereafter occurring, nor shall any waiver of any single breach or default be deemed a waiver of any other breach or default theretofore or thereafter occurring. All remedies, whether under this Agreement or by law or otherwise afforded to any party, shall be cumulative and not alternative.

6.12 Submission to Jurisdiction. The parties hereto submit to the exclusive jurisdiction of any federal or state court located within the Commonwealth of Massachusetts over any dispute arising out of or relating to the Agreement or any of the transactions contemplated hereby and each party hereby agree that all claims in respect of such dispute or any suit, action or proceeding related thereto may be heard and determined in such courts. The parties waive, to the fullest extent permitted by applicable law, any objection which they may not or hereafter have to the laying of venue of any such dispute brought in such court or any defense of inconvenient forum for the maintenance of such dispute. Each of the parties hereto agrees that a judgment in any such dispute may be enforced in other jurisdictions by suit on the judgment or in any other manner provided by law.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties have executed this Second Amended and Restated Investors' Rights Agreement as of the date first written above.

COMPANY:

MAGENTA THERAPEUTICS, INC.

By: /s/ Jason Gardner

Name: Jason Gardner

Title: President and Chief Executive Officer

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Second Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

THIRD ROCK VENTURES IV, L.P.

By: Third Rock Ventures GP IV, L.P., its general partner

By: TRV GP IV, LLC, its general partner

By: /s/ Kevin Gillis

Name: Kevin Gillis

Title: CFO/Partner

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

ATLAS VENTURE FUND X, L.P.

By: Atlas Venture Associates X, L.P.
Its General Partner

By: Atlas Venture Associates X, LLC
Its General Partner

By: /s/ Ommer Chohan

Name: Ommer Chohan

Title: CFO

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

GV 2016, L.P.

By: GV 2016 GP, L.P., its General Partner

By: GV 2016 GP, L.L.C., its General Partner

By: /s/ Daphne M. Chang

Name: Daphne M. Chang

Title: Authorized Signatory

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

BE THE MATCH BIOTHERAPIES, LLC

By: /s/ Amy Ronneberg

Name: Amy Ronneberg

Title: President

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

ACCESS INDUSTRIES HOLDINGS LLC

By: Access Industries Management, LLC,
Its Manager

By: /s/ Peter L. Theorén
Name: Peter L. Theorén
Title: Executive Vice President

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

PARTNERS INNOVATION FUND, LLC

By: /s/ Roger Kitterman
Name: Roger Kitterman
Title: Managing Partner

PARTNERS INNOVATION FUND II, L.P.

By: /s/ Roger Kitterman
Name: Roger Kitterman
Title: Managing Partner

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

CASDIN PARTNERS MASTER FUND, LP

By: Casdin Partners GP, LLC, its General Partner

By: /s/ Eli Casdin

Name: Eli Casdin

Title: Managing Partner

CASDIN VENTURE OPPORTUNITIES FUND, L.P.

By: Casdin Partners GP, LLC, its General Partner

By: /s/ Eli Casdin

Name: Eli Casdin

Title: Managing Partner

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

**NOVARTIS INTERNATIONAL PHARMACEUTICAL
LTD.**

By: /s/ Scott A. Brown

Name: Scott A. Brown

Title: Vice President, General Counsel

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

IN WITNESS WHEREOF, the parties have executed this Second Amended and Restated Investors' Rights Agreement as of the date first written above.

INVESTOR:

By: /s/ Robert W. Postma
Name: **Robert W Postma**

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

**MUTUAL FUND SERIES TRUST, ON BEHALF OF
EVENTIDE HEALTHCARE & LIFE SCIENCES FUND**

By: /s/ Erik Naviloff

Name: Erik Naviloff

Title: Treasurer

INVESTOR:

**MUTUAL FUND SERIES TRUST, ON BEHALF OF
EVENTIDE GILEAD FUND**

By: /s/ Erik Naviloff

Name: Erik Naviloff

Title: Treasurer

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

EcoR1 CAPITAL FUND, LP

By: EcoR1 Capital LLC, its General Partner

By: /s/ Oleg Nodelman

Name: Oleg Nodelman

Title: Manager

EcoR1 CAPITAL FUND QUALIFIED, LP

By: EcoR1 Capital LLC, its General Partner

By: /s/ Oleg Nodelman

Name: Oleg Nodelman

Title: Manager

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

**HARVARD MANAGEMENT PRIVATE EQUITY
CORPORATION**

By: /s/ Richard W. Slocum

Name: Richard W. Slocum

Title: Authorized Signatory

By: /s/ Marcus Loveland

Name: Marcus Loveland

Title: Authorized Signatory

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

Fifth Avenue Private Equity 14 LLC

By: /s/ Charles D. Bryceland

Name: Charles D. Bryceland

Title: Managing Director

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

SCubed Capital, LLC

By: /s/ Mark Stevens

Name: Mark Stevens

Title: Managing Partner

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

PH Investments, LLC

By: /s/ John W. Vander Vort
Name: John W. Vander Vort
Title: Managing Director

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

Sobrato Family Holdings, LLC

By: /s/ Matthew W. Sonsini

Name: Matthew W. Sonsini

Title: Chief Investment Officer, on behalf of Sobrato Family Holdings, LLC

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

Portland Magenta EP, LLC

By: Partners HealthCare Master Trust for
ERISA Assets, its managing member

By: /s/ David Weden

Name: David Weden

Title: Authorized Signatory

INVESTOR:

Portland Magenta PIA, LLC

By: Partners HealthCare System Pooled Investment
Accounts, LLC, its managing member

By: /s/ David Weden

Name: David Weden

Title: Authorized Signatory

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ David Scadden

Name: David Scadden

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Jeffrey Albers

Name: Jeffrey Albers

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Zoran Zdraveski

Name: Zoran Zdraveski

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Manisha Pai

Name: Manisha Pai

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ John Davis

Name: John Davis

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Derrick Rossi

Name: Derrick Rossi

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

INVESTORS:

/s/ Jason Gardner

Name: Jason Gardner

J.P. GARDNER IRREVOCABLE TRUST

By: /s/ Patcharin S. Gardner

Name: Patcharin S. Gardner

Title: Trustee

By: /s/ Peter M. Frasca

Name: Peter M. Frasca, Esq.

Title: Trustee

P.S. GARDNER IRREVOCABLE TRUST

By: /s/ Jason P. Gardner

Name: Jason P. Gardner

Title: Trustee

By: /s/ Peter M. Frasca

Name: Peter M. Frasca, Esq.

Title: Trustee

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Bastiano Sanna

Name: Bastiano Sanna

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Michael Cooke

Name: Michael Cooke

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Christina Isacson

Name: Christina Isacson

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Thomas Daniel

Name: Thomas Daniel

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

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INVESTOR:

/s/ Michael Bonney

Name: Michael Bonney

[Signature Page to Second Amended and Restated Investors' Rights Agreement]

SCHEDULE A

INVESTORS

Name and Address

Third Rock Ventures IV, L.P.

29 Newbury Street, 3rd Floor
Boston, MA 02116

Atlas Venture Fund X, L.P.

400 Technology Square, 10th Floor
Cambridge, MA 02139 Attention: Ommer Chohan
E-mail: ommer@atlasventure.com, with a copy to bruce@atlasventure.com

GV 2016, L.P.

Email: notice@gv.com
Attn: Daphne M. Chang
1600 Amphitheatre Parkway
Mountain View, CA 94043

Be The Match BioTherapies, LLC

500 N. 5th Street
Minneapolis, Minnesota 55401-1206
Attn: Amy Ronneberg

Novartis Institutes for Biomedical Research, Inc.

250 Massachusetts Avenue
Cambridge, MA 02139

Access Industries Holdings LLC

c/o Access Industries Management, LLC
730 Fifth Avenue, 20th Floor
New York, New York 10019

Partners Innovation Fund LLC

215 First Street
Cambridge, MA 02142

Partners Innovation Fund II, LP

215 First Street
Cambridge, MA 02142

Casdin Partners Master Fund, LP

1350 Avenue of the Americas, 24th Floor
New York, NY 10019

Casdin Venture Opportunities Fund, LP

1350 Avenue of the Americas, 24th Floor
New York, NY 10019

Robert W. Postma

Mutual Fund Series Trust, on Behalf of Eventide Healthcare and Life Sciences Fund

Mutual Fund Series Trust, on Behalf of Eventide Gilead Fund

EcoR1 Capital Fund, LP

EcoR1 Capital Fund Qualified, LP

Harvard Management Private Equity Corporation

600 Atlantic Avenue
Boston, MA 02210
Attn: Elise McDonald and Emily Carroll
Email: mcdonald@hmc.harvard.edu; carrolle@hmc.harvard.edu

Fifth Avenue Private Equity 14 LLC

Bessemer Trust Company, N.A.
630 Fifth Avenue
New York, NY 10111
Email: PrivateEquity@bessemer.com

SCubed Capital, LLC

2061 Avy Avenue
Menlo Park, CA 94025
Attention: Mark Stevens, mark@scubedcap.com
Margo Doyle, margo@scubedcap.com

Please also copy finance@scubedcap.com for any communications.

PH Investments, LLC

Pilot House, Lewis Wharf
Boston, MA 02110
Attention: Ben Gomez; John Vander Vort; April Robinson
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Portland Magenta EP, LLC

Partners HealthCare Investment Office

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Portland Magenta PIA, LLC

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J.P. Gardner Irrevocable Trust

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Thomas Daniel

Michael Bonney

Jeffrey Albers

Manisha Pai

Zoran Zdraveski

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MAGENTA THERAPEUTICS, INC.

2016 STOCK OPTION AND GRANT PLAN

SECTION 1. GENERAL PURPOSE OF THE PLAN; DEFINITIONS

The name of the plan is the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the “*Plan*”). The purpose of the Plan is to encourage and enable the officers, employees, directors, Consultants and other key persons of Magenta Therapeutics, Inc., a Delaware corporation (including any successor entity, the “*Company*”) and its Subsidiaries, upon whose judgment, initiative and efforts the Company largely depends for the successful conduct of its business, to acquire a proprietary interest in the Company.

The following terms shall be defined as set forth below:

“*Affiliate*” of any Person means a Person that directly or indirectly, through one or more intermediaries, controls, is controlled by or is under common control with the first mentioned Person. A Person shall be deemed to control another Person if such first Person possesses directly or indirectly the power to direct, or cause the direction of, the management and policies of the second Person, whether through the ownership of voting securities, by contract or otherwise.

“*Award*” or “*Awards*,” except where referring to a particular category of grant under the Plan, shall include Incentive Stock Options, Non-Qualified Stock Options, Restricted Stock Awards, Unrestricted Stock Awards, Restricted Stock Units or any combination of the foregoing.

“*Award Agreement*” means a written or electronic agreement setting forth the terms and provisions applicable to an Award granted under the Plan. Each Award Agreement may contain terms and conditions in addition to those set forth in the Plan; *provided, however*, in the event of any conflict in the terms of the Plan and the Award Agreement, the terms of the Plan shall govern.

“*Board*” means the Board of Directors of the Company.

“*Cause*” shall have the meaning as set forth in the Award Agreement(s). In the case that any Award Agreement does not contain a definition of “*Cause*,” it shall mean (i) the grantee’s dishonest statements or acts with respect to the Company or any Affiliate of the Company, or any current or prospective customers, suppliers vendors or other third parties with which such entity does business; (ii) the grantee’s commission of (A) a felony or (B) any misdemeanor involving moral turpitude, deceit, dishonesty or fraud; (iii) the grantee’s failure to perform his assigned duties and responsibilities to the reasonable satisfaction of the Company which failure continues, in the reasonable judgment of the Company, after written notice given to the grantee by the Company; (iv) the grantee’s gross negligence, willful misconduct or insubordination with respect to the Company or any Affiliate of the Company; or (v) the grantee’s material violation of any provision of any agreement(s) between the grantee and the Company relating to noncompetition, nonsolicitation, nondisclosure and/or assignment of inventions.

“*Chief Executive Officer*” means the Chief Executive Officer of the Company or, if there is no Chief Executive Officer, then the President of the Company.

“*Code*” means the Internal Revenue Code of 1986, as amended, and any successor Code, and related rules, regulations and interpretations.

“*Committee*” means the Committee of the Board referred to in Section 2.

“*Consultant*” means any natural person that provides bona fide services to the Company (including a Subsidiary), and such services are not in connection with the offer or sale of securities in a capital-raising transaction and do not directly or indirectly promote or maintain a market for the Company’s securities.

“*Disability*” means “disability” as defined in Section 422(c) of the Code.

“*Effective Date*” means the date on which the Plan is adopted as set forth on the final page of the Plan.

“*Exchange Act*” means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

“*Fair Market Value*” of the Stock on any given date means the fair market value of the Stock determined in good faith by the Committee based on the reasonable application of a reasonable valuation method not inconsistent with Section 409A of the Code. If the Stock is admitted to trade on a national securities exchange, the determination shall be made by reference to the closing price reported on such exchange. If there is no closing price for such date, the determination shall be made by reference to the last date preceding such date for which there is a closing price. If the date for which Fair Market Value is determined is the first day when trading prices for the Stock are reported on a national securities exchange, the Fair Market Value shall be the “Price to the Public” (or equivalent) set forth on the cover page for the final prospectus relating to the Company’s Initial Public Offering.

“*Good Reason*” shall have the meaning as set forth in the Award Agreement(s). In the case that any Award Agreement does not contain a definition of “Good Reason,” it shall mean (i) a material diminution in the grantee’s base salary except for across-the-board salary reductions similarly affecting all or substantially all similarly situated employees of the Company or (ii) a change of more than 50 miles in the geographic location at which the grantee provides services to the Company, so long as the grantee provides at least ninety (90) days notice to the Company following the initial occurrence of any such event and the Company fails to cure such event within thirty (30) days thereafter.

“*Grant Date*” means the date that the Committee designates in its approval of an Award in accordance with applicable law as the date on which the Award is granted, which date may not precede the date of such Committee approval.

“*Holder*” means, with respect to an Award or any Shares, the Person holding such Award or Shares, including the initial recipient of the Award or any Permitted Transferee.

“*Incentive Stock Option*” means any Stock Option designated and qualified as an “incentive stock option” as defined in Section 422 of the Code.

“*Initial Public Offering*” means the consummation of the first firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act covering the offer and sale by the Company of its equity securities, as a result of or following which the Stock shall be publicly held.

“*Non-Qualified Stock Option*” means any Stock Option that is not an Incentive Stock Option.

“*Option*” or “*Stock Option*” means any option to purchase shares of Stock granted pursuant to Section 5.

“*Permitted Transferees*” shall mean any of the following to whom a Holder may transfer Shares hereunder (as set forth in Section 9(a)(ii)(A)): the Holder’s child, stepchild, grandchild, parent, stepparent, grandparent, spouse, former spouse, sibling, niece, nephew, mother-in-law, father-in-law, son-in-law, daughter-in-law, brother-in-law, or sister-in-law, including adoptive relationships, any person sharing the Holder’s household (other than a tenant or employee), a trust in which these persons have more than fifty percent of the beneficial interest, a foundation in which these persons control the management of assets, and any other entity in which these persons own more than fifty percent of the voting interests; *provided, however*, that any such trust does not require or permit distribution of any Shares during the term of the Award Agreement unless subject to its terms. Upon the death of the Holder, the term Permitted Transferees shall also include such deceased Holder’s estate, executors, administrators, personal representatives, heirs, legatees and distributees, as the case may be.

“*Person*” shall mean any individual, corporation, partnership (limited or general), limited liability company, limited liability partnership, association, trust, joint venture, unincorporated organization or any similar entity.

“*Restricted Stock Award*” means Awards granted pursuant to Section 6 and “*Restricted Stock*” means Shares issued pursuant to such Awards.

“*Restricted Stock Unit*” means an Award of phantom stock units to a grantee, which may be settled in cash or Shares as determined by the Committee, pursuant to Section 8.

“*Sale Event*” means the consummation of (i) the dissolution or liquidation of the Company, (ii) the sale of all or substantially all of the assets of the Company on a consolidated basis to an unrelated person or entity, (iii) a merger, reorganization or consolidation pursuant to which the holders of the Company’s outstanding voting power immediately prior to such transaction do not own a majority of the outstanding voting power of the surviving or resulting entity (or its ultimate parent, if applicable), (iv) the acquisition of all or a majority of the outstanding voting stock of the Company in a single transaction or a series of related transactions by a Person or group of Persons, (v) a Deemed Liquidation Event (as defined in the Company’s

Certificate of Incorporation (as may be amended, restated or otherwise modified from time to time)), or (vi) any other acquisition of the business of the Company, as determined by the Board; *provided, however*, that the Company's Initial Public Offering, any subsequent public offering or another capital raising event, or a merger effected solely to change the Company's domicile shall not constitute a "Sale Event."

"Section 409A" means Section 409A of the Code and the regulations and other guidance promulgated thereunder.

"Securities Act" means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

"Service Relationship" means any relationship as a full-time employee, part-time employee, director or other key person (including Consultants) of the Company or any Subsidiary or any successor entity (e.g., a Service Relationship shall be deemed to continue without interruption in the event an individual's status changes from full-time employee to part-time employee or Consultant).

"Shares" means shares of Stock.

"Stock" means the Common Stock, par value \$0.001 per share, of the Company.

"Subsidiary" means any corporation or other entity (other than the Company) in which the Company has more than a 50 percent interest, either directly or indirectly.

"Ten Percent Owner" means an employee who owns or is deemed to own (by reason of the attribution rules of Section 424(d) of the Code) more than 10 percent of the combined voting power of all classes of stock of the Company or any parent of the Company or any Subsidiary.

"Termination Event" means the termination of the Award recipient's Service Relationship with the Company and its Subsidiaries for any reason whatsoever, regardless of the circumstances thereof, and including, without limitation, upon death, disability, retirement, discharge or resignation for any reason, whether voluntarily or involuntarily. The following shall not constitute a Termination Event: (i) a transfer to the service of the Company from a Subsidiary or from the Company to a Subsidiary, or from one Subsidiary to another Subsidiary or (ii) an approved leave of absence for military service or sickness, or for any other purpose approved by the Committee, if the individual's right to re-employment is guaranteed either by a statute or by contract or under the policy pursuant to which the leave of absence was granted or if the Committee otherwise so provides in writing.

"Unrestricted Stock Award" means any Award granted pursuant to Section 7 and "Unrestricted Stock" means Shares issued pursuant to such Awards.

SECTION 2. ADMINISTRATION OF PLAN; COMMITTEE AUTHORITY TO SELECT GRANTEES AND DETERMINE AWARDS

(a) Administration of Plan. The Plan shall be administered by the Board, or at the discretion of the Board, by a committee of the Board, comprised of not less than two (2) directors. All references herein to the "Committee" shall be deemed to refer to the group then responsible for administration of the Plan at the relevant time (i.e., either the Board of Directors or a committee or committees of the Board, as applicable).

(b) Powers of Committee. The Committee shall have the power and authority to grant Awards consistent with the terms of the Plan, including the power and authority:

(i) to select the individuals to whom Awards may from time to time be granted;

(ii) to determine the time or times of grant, and the amount, if any, of Incentive Stock Options, Non-Qualified Stock Options, Restricted Stock Awards, Unrestricted Stock Awards, Restricted Stock Units, or any combination of the foregoing, granted to any one or more grantees;

(iii) to determine the number of Shares to be covered by any Award and, subject to the provisions of the Plan, the price, exercise price, conversion ratio or other price relating thereto;

(iv) to determine and, subject to Section 12, to modify from time to time the terms and conditions, including restrictions, not inconsistent with the terms of the Plan, of any Award, which terms and conditions may differ among individual Awards and grantees, and to approve the form of Award Agreements;

(v) to accelerate at any time the exercisability or vesting of all or any portion of any Award;

(vi) to impose any limitations on Awards, including limitations on transfers, repurchase provisions and the like, and to exercise repurchase rights or obligations;

(vii) subject to Section 5(a)(ii) and any restrictions imposed by Section 409A, to extend at any time the period in which Stock Options may be exercised; and

(viii) at any time to adopt, alter and repeal such rules, guidelines and practices for administration of the Plan and for its own acts and proceedings as it shall deem advisable; to interpret the terms and provisions of the Plan and any Award (including Award Agreements); to make all determinations it deems advisable for the administration of the Plan; to decide all disputes arising in connection with the Plan; and to otherwise supervise the administration of the Plan.

All decisions and interpretations of the Committee shall be binding on all persons, including the Company and all Holders.

(c) Delegation of Authority to Grant Options. Subject to applicable law, the Committee, in its discretion, may delegate to the Chief Executive Officer of the Company the power to designate non-officer employees to be recipients of Options, and to determine the number of such Options to be received by such employees; provided, however, that the resolution so authorizing the Chief Executive Officer shall specify the total number of Options

the Chief Executive Officer may so award and may not delegate to the Chief Executive Officer the authority to set the exercise price or the vesting terms of such Options. Any such delegation by the Committee shall also provide that the Chief Executive Officer may not grant Awards to himself or herself (or other officers) without the approval of the Committee. The Committee may revoke or amend the terms of a delegation at any time but such action shall not invalidate any prior actions of the Committee's delegate or delegates that were consistent with the terms of the Plan.

(d) Award Agreement. Awards under the Plan shall be evidenced by Award Agreements that set forth the terms, conditions and limitations for each Award.

(e) Indemnification. Neither the Board nor the Committee, nor any member of either or any delegate thereof, shall be liable for any act, omission, interpretation, construction or determination made in good faith in connection with the Plan, and the members of the Board and the Committee (and any delegate thereof) shall be entitled in all cases to indemnification and reimbursement by the Company in respect of any claim, loss, damage or expense (including, without limitation, reasonable attorneys' fees) arising or resulting therefrom to the fullest extent permitted by law and/or under the Company's governing documents, including its certificate of incorporation or bylaws (each, as may be amended, restated, or otherwise modified from time to time), or any directors' and officers' liability insurance coverage which may be in effect from time to time and/or any indemnification agreement between such individual and the Company.

(f) Foreign Award Recipients. Notwithstanding any provision of the Plan to the contrary, in order to comply with the laws in other countries in which the Company and any Subsidiary operate or have employees or other individuals eligible for Awards, the Committee, in its sole discretion, shall have the power and authority to: (i) determine which Subsidiaries, if any, shall be covered by the Plan; (ii) determine which individuals, if any, outside the United States are eligible to participate in the Plan; (iii) modify the terms and conditions of any Award granted to individuals outside the United States to comply with applicable foreign laws; (iv) establish subplans and modify exercise procedures and other terms and procedures, to the extent the Committee determines such actions to be necessary or advisable (and such subplans and/or modifications shall be attached to the Plan as appendices); provided, however, that no such subplans and/or modifications shall increase the share limitation contained in Section 3(a) hereof; and (v) take any action, before or after an Award is made, that the Committee determines to be necessary or advisable to obtain approval or comply with any local governmental regulatory exemptions or approvals.

SECTION 3. STOCK ISSUABLE UNDER THE PLAN; MERGERS AND OTHER TRANSACTIONS; SUBSTITUTION

(a) Stock Issuable. The maximum number of Shares reserved and available for issuance under the Plan shall be 7,025,000 Shares, subject to adjustment as provided in Section 3(b). For purposes of this limitation, the Shares underlying any Awards that are forfeited, canceled, reacquired by the Company prior to vesting, satisfied without the issuance of Stock or otherwise terminated (other than by exercise) and Shares that are withheld upon exercise of an Option or settlement of an Award to cover the exercise price or tax withholding shall be added back to the Shares available for issuance under the Plan. Subject to such overall limitations,

Shares may be issued up to such maximum number pursuant to any type or types of Award, and no more than 50,000,000 Shares may be issued pursuant to Incentive Stock Options. The Shares available for issuance under the Plan may be authorized but unissued Shares or Shares reacquired by the Company. Beginning on the date that the Company becomes subject to Section 162(m) of the Code, Options with respect to no more than 7,025,000 Shares shall be granted to any one individual in any calendar year period.

(b) Changes in Stock. Subject to Section 3(c) hereof, if, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Company's capital stock, the outstanding Shares are increased or decreased or are exchanged for a different number or kind of shares or other securities of the Company, or additional Shares or new or different shares or other securities of the Company or other non-cash assets are distributed with respect to such Shares or other securities, in each case, without the receipt of consideration by the Company, or, if, as a result of any merger or consolidation, or sale of all or substantially all of the assets of the Company, the outstanding Shares are converted into or exchanged for other securities of the Company or any successor entity (or a parent or subsidiary thereof), the Committee shall make an appropriate and proportionate adjustment in (i) the maximum number of Shares reserved for issuance under the Plan, (ii) the number and kind of Shares or other securities subject to any then outstanding Awards under the Plan, (iii) the repurchase price, if any, per Share subject to each outstanding Award, and (iv) the exercise price for each Share subject to any then outstanding Stock Options under the Plan, without changing the aggregate exercise price (i.e., the per share exercise price multiplied by the number of shares underlying such Stock Options) as to which such Stock Options remain exercisable. The adjustment by the Committee shall be final, binding and conclusive. No fractional Shares shall be issued under the Plan resulting from any such adjustment, but the Committee in its discretion may make a cash payment in lieu of fractional shares.

(c) Sale Events.

(i) Options.

(A) In the case of and subject to the consummation of a Sale Event, the Plan and all outstanding Options issued hereunder shall terminate upon the effective time of any such Sale Event unless assumed or continued by the successor entity, or new stock options or other awards of the successor entity or parent thereof are substituted therefor, with an equitable or proportionate adjustment as to the number and kind of shares and, if appropriate, the per share exercise prices, as such parties shall agree (after taking into account any acceleration hereunder and/or pursuant to the terms of any Award Agreement).

(B) In the event of the termination of the Plan and all outstanding Options issued hereunder pursuant to Section 3(c), each Holder of Options shall be permitted, within a period of time prior to the consummation of the Sale Event as specified by the Committee, to exercise all such Options which are then exercisable or will become exercisable as of the effective time of the Sale Event; *provided, however*, that the exercise of Options not exercisable prior to the Sale Event shall be subject to the consummation of the Sale Event.

(C) Notwithstanding anything to the contrary in Section 3(c)(i)(A), in the event of a Sale Event, the Company shall have the right, but not the obligation, to make or provide for a cash payment to the Holders of Options, without any consent of the Holders, in exchange for the cancellation thereof, in an amount equal to the difference between (A) the value as determined by the Committee of the consideration payable per share of Stock pursuant to the Sale Event (the "*Sale Price*") times the number of Shares subject to outstanding Options being cancelled (to the extent then vested and exercisable, including by reason of acceleration in connection with such Sale Event, at prices not in excess of the Sale Price) and (B) the aggregate exercise price of all such outstanding vested and exercisable Options.

(ii) Restricted Stock and Restricted Stock Unit Awards.

(A) In the case of and subject to the consummation of a Sale Event, all Restricted Stock and unvested Restricted Stock Unit Awards (other than those becoming vested as a result of the Sale Event) issued hereunder shall be forfeited immediately prior to the effective time of any such Sale Event unless assumed or continued by the successor entity, or awards of the successor entity or parent thereof are substituted therefor, with an equitable or proportionate adjustment as to the number and kind of shares subject to such awards as such parties shall agree (after taking into account any acceleration hereunder and/or pursuant to the terms of any Award Agreement).

(B) In the event of the forfeiture of Restricted Stock pursuant to Section 3(c)(ii)(A), such Restricted Stock shall be repurchased from the Holder thereof at a price per share equal to the lower of the original per share purchase price paid by the Holder (subject to adjustment as provided in Section 3(b)) or the current Fair Market Value of such Shares, determined immediately prior to the effective time of the Sale Event.

(C) Notwithstanding anything to the contrary in Section 3(c)(ii)(A), in the event of a Sale Event, the Company shall have the right, but not the obligation, to make or provide for a cash payment to the Holders of Restricted Stock or Restricted Stock Unit Awards, without consent of the Holders, in exchange for the cancellation thereof, in an amount equal to the Sale Price times the number of Shares subject to such Awards, to be paid at the time of such Sale Event or upon the later vesting of such Awards.

SECTION 4. ELIGIBILITY

Grantees under the Plan will be such full or part-time officers and other employees, directors, Consultants and key persons of the Company and any Subsidiary who are selected from time to time by the Committee in its sole discretion; provided, however, that Awards shall be granted only to those individuals described in Rule 701(c) of the Securities Act.

SECTION 5. STOCK OPTIONS

Upon the grant of a Stock Option, the Company and the grantee shall enter into an Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee, and such terms and conditions may differ among individual Awards and grantees.

Stock Options granted under the Plan may be either Incentive Stock Options or Non-Qualified Stock Options. Incentive Stock Options may be granted only to employees of the Company or any Subsidiary that is a “subsidiary corporation” within the meaning of Section 424(f) of the Code. To the extent that any Option does not qualify as an Incentive Stock Option, it shall be deemed a Non-Qualified Stock Option.

(a) Terms of Stock Options. The Committee in its discretion may grant Stock Options to those individuals who meet the eligibility requirements of Section 4. Stock Options shall be subject to the following terms and conditions and shall contain such additional terms and conditions, not inconsistent with the terms of the Plan, as the Committee shall deem desirable.

(i) Exercise Price. The exercise price per share for the Shares covered by a Stock Option shall be determined by the Committee at the time of grant but shall not be less than 100 percent of the Fair Market Value on the Grant Date. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the exercise price per share for the Shares covered by such Incentive Stock Option shall not be less than 110 percent of the Fair Market Value on the Grant Date.

(ii) Option Term. The term of each Stock Option shall be fixed by the Committee, but no Stock Option shall be exercisable more than ten (10) years from the Grant Date. In the case of an Incentive Stock Option that is granted to a Ten Percent Owner, the term of such Stock Option shall be no more than five (5) years from the Grant Date.

(iii) Exercisability; Rights of a Stockholder. Stock Options shall become exercisable and/or vested at such time or times, whether or not in installments, as shall be determined by the Committee at or after the Grant Date. The Award Agreement may permit a grantee to exercise all or a portion of a Stock Option immediately at grant; provided that the Shares issued upon such exercise shall be subject to restrictions and a vesting schedule identical to the vesting schedule of the related Stock Option, such Shares shall be deemed to be Restricted Stock for purposes of the Plan, and the optionee may be required to enter into an additional or new Award Agreement as a condition to exercise of such Stock Option. An optionee shall have the rights of a stockholder only as to Shares acquired upon the exercise of a Stock Option and not as to unexercised Stock Options. An optionee shall not be deemed to have acquired any Shares unless and until a Stock Option shall have been exercised pursuant to the terms of the Award Agreement and this Plan and the optionee’s name has been entered on the books of the Company as a stockholder.

(iv) Method of Exercise. Stock Options may be exercised by an optionee in whole or in part, by the optionee giving written or electronic notice of exercise to the Company, specifying the number of Shares to be purchased. Payment of the purchase price may be made by one or more of the following methods (or any combination thereof) to the extent provided in the Award Agreement:

(A) In cash, by certified or bank check, by wire transfer of immediately available funds, or other instrument acceptable to the Committee;

(B) If permitted by the Committee, by the optionee delivering to the Company a promissory note, if the Board has expressly authorized the loan of funds to the optionee for the purpose of enabling or assisting the optionee to effect the exercise of his or her Stock Option; provided, that at least so much of the exercise price as represents the par value of the Stock shall be paid in cash if required by state law;

(C) If permitted by the Committee and the Initial Public Offering has occurred (or the Stock otherwise becomes publicly-traded), through the delivery (or attestation to the ownership) of Shares that have been purchased by the optionee on the open market or that are beneficially owned by the optionee and are not then subject to restrictions under any Company plan. To the extent required to avoid variable accounting treatment under ASC 718 or other applicable accounting rules, such surrendered Shares if originally purchased from the Company shall have been owned by the optionee for at least six (6) months. Such surrendered Shares shall be valued at Fair Market Value on the exercise date;

(D) If permitted by the Committee and the Initial Public Offering has occurred (or the Stock otherwise becomes publicly-traded), by the optionee delivering to the Company a properly executed exercise notice together with irrevocable instructions to a broker to promptly deliver to the Company cash or a check payable and acceptable to the Company for the purchase price; provided that in the event the optionee chooses to pay the purchase price as so provided, the optionee and the broker shall comply with such procedures and enter into such agreements of indemnity and other agreements as the Committee shall prescribe as a condition of such payment procedure; or

(E) If permitted by the Committee, and only with respect to Stock Options that are not Incentive Stock Options, by a “net exercise” arrangement pursuant to which the Company will reduce the number of Shares issuable upon exercise by the largest whole number of Shares with a Fair Market Value that does not exceed the aggregate exercise price.

Payment instruments will be received subject to collection. No certificates for Shares so purchased will be issued to the optionee or, with respect to uncertificated Stock, no transfer to the optionee on the records of the Company will take place, until the Company has completed all steps it has deemed necessary to satisfy legal requirements relating to the issuance and sale of the Shares, which steps may include, without limitation, (i) receipt of a representation from the optionee at the time of exercise of the Option that the optionee is purchasing the Shares for the optionee’s own account and not with a view to any sale or distribution of the Shares or other representations relating to compliance with applicable law governing the issuance of securities, (ii) the legending of the certificate (or notation on any book entry) representing the Shares to evidence the foregoing restrictions, (iii) obtaining from optionee payment or provision for all

withholding taxes due as a result of the exercise of the Option, and (iv) if required by the Company, the optionee's execution and delivery of any stockholders' agreements or other agreements with the Company and/or certain other stockholders of the Company relating to shares of the Stock. The delivery of certificates representing the shares of Stock (or the transfer to the optionee on the records of the Company with respect to uncertificated Stock) to be purchased pursuant to the exercise of a Stock Option will be contingent upon (A) receipt from the optionee (or a purchaser acting in his or her stead in accordance with the provisions of the Stock Option) by the Company of the full purchase price for such Shares and the fulfillment of any other requirements contained in the Award Agreement or applicable provisions of laws and (B) if required by the Company, the optionee shall have entered into any stockholders agreements or other agreements with the Company and/or certain other of the Company's stockholders relating to the Stock. In the event an optionee chooses to pay the purchase price by previously-owned Shares through the attestation method, the number of Shares transferred to the optionee upon the exercise of the Stock Option shall be net of the number of Shares attested to.

(b) Annual Limit on Incentive Stock Options. To the extent required for "incentive stock option" treatment under Section 422 of the Code, the aggregate Fair Market Value (determined as of the Grant Date) of the Shares with respect to which Incentive Stock Options granted under the Plan and any other plan of the Company or its parent and any Subsidiary that become exercisable for the first time by an optionee during any calendar year shall not exceed \$100,000 or such other limit as may be in effect from time to time under Section 422 of the Code. To the extent that any Stock Option exceeds this limit, it shall constitute a Non-Qualified Stock Option.

(c) Termination. Any portion of a Stock Option that is not vested and exercisable on the date of termination of an optionee's Service Relationship shall immediately expire and be null and void. Once any portion of the Stock Option becomes vested and exercisable, the optionee's right to exercise such portion of the Stock Option (or the optionee's representatives and legatees as applicable) in the event of a termination of the optionee's Service Relationship shall continue until the earliest of: (i) the date which is: (A) twelve (12) months following the date on which the optionee's Service Relationship terminates due to death or Disability (or such longer period of time as determined by the Committee and set forth in the applicable Award Agreement), or (B) three (3) months following the date on which the optionee's Service Relationship terminates if the termination is due to any reason other than death or Disability (or such longer period of time as determined by the Committee and set forth in the applicable Award Agreement), or (ii) the Expiration Date set forth in the Award Agreement; provided that notwithstanding the foregoing, an Award Agreement may provide that if the optionee's Service Relationship is terminated for Cause, the Stock Option shall terminate immediately and be null and void upon the date of the optionee's termination and shall not thereafter be exercisable.

SECTION 6. RESTRICTED STOCK AWARDS

(a) Nature of Restricted Stock Awards. The Committee may, in its sole discretion, grant (or sell at par value or such other purchase price determined by the Committee) to an eligible individual under Section 4 hereof a Restricted Stock Award under the Plan. The Committee shall determine the restrictions and conditions applicable to each Restricted Stock Award at the time of grant. Conditions may be based on continuing employment (or other

Service Relationship), achievement of pre-established performance goals and objectives and/or such other criteria as the Committee may determine. Upon the grant of a Restricted Stock Award, the Company and the grantee shall enter into an Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee, and such terms and conditions may differ among individual Awards and grantees.

(b) Rights as a Stockholder. Upon the grant of the Restricted Stock Award and payment of any applicable purchase price, a grantee of Restricted Stock shall be considered the record owner of and shall be entitled to vote the Restricted Stock if, and to the extent, such Shares are entitled to voting rights, subject to such conditions contained in the Award Agreement. The grantee shall be entitled to receive all dividends and any other distributions declared on the Shares; provided, however, that the Company is under no duty to declare any such dividends or to make any such distribution. Unless the Committee shall otherwise determine, certificates evidencing the Restricted Stock shall remain in the possession of the Company until such Restricted Stock is vested as provided in subsection (d) below of this Section, and the grantee shall be required, as a condition of the grant, to deliver to the Company a stock power endorsed in blank and such other instruments of transfer as the Committee may prescribe.

(c) Restrictions. Restricted Stock may not be sold, assigned, transferred, pledged or otherwise encumbered or disposed of except as specifically provided herein or in the Award Agreement. Except as may otherwise be provided by the Committee either in the Award Agreement or, subject to Section 12 below, in writing after the Award Agreement is issued, if a grantee's Service Relationship with the Company and any Subsidiary terminates, the Company or its assigns shall have the right, as may be specified in the relevant instrument, to repurchase some or all of the Shares subject to the Award at such purchase price as is set forth in the Award Agreement.

(d) Vesting of Restricted Stock. The Committee at the time of grant shall specify in the Award Agreement the date or dates and/or the attainment of pre-established performance goals, objectives and other conditions on which the substantial risk of forfeiture imposed shall lapse and the Restricted Stock shall become vested, subject to such further rights of the Company or its assigns as may be specified in the Award Agreement.

SECTION 7. UNRESTRICTED STOCK AWARDS

The Committee may, in its sole discretion, grant (or sell at par value or such other purchase price determined by the Committee) to an eligible person under Section 4 hereof an Unrestricted Stock Award under the Plan. Unrestricted Stock Awards may be granted in respect of past services or other valid consideration, or in lieu of cash compensation due to such grantee.

SECTION 8. RESTRICTED STOCK UNITS

(a) Nature of Restricted Stock Units. The Committee may, in its sole discretion, grant to an eligible person under Section 4 hereof Restricted Stock Units under the Plan. The Committee shall determine the restrictions and conditions applicable to each Restricted Stock Unit at the time of grant. Vesting conditions may be based on continuing employment (or other

Service Relationship), achievement of pre-established performance goals and objectives and/or other such criteria as the Committee may determine. Upon the grant of Restricted Stock Units, the grantee and the Company shall enter into an Award Agreement. The terms and conditions of each such Award Agreement shall be determined by the Committee and may differ among individual Awards and grantees. On or promptly following the vesting date or dates applicable to any Restricted Stock Unit, but in no event later than March 15 of the year following the year in which such vesting occurs, such Restricted Stock Unit(s) shall be settled in the form of cash or shares of Stock, as specified in the Award Agreement. Restricted Stock Units may not be sold, assigned, transferred, pledged, or otherwise encumbered or disposed of.

(b) Rights as a Stockholder. A grantee shall have the rights of a stockholder only as to Shares, if any, acquired upon settlement of Restricted Stock Units. A grantee shall not be deemed to have acquired any such Shares unless and until the Restricted Stock Units shall have been settled in Shares pursuant to the terms of the Plan and the Award Agreement, the Company shall have issued and delivered a certificate representing the Shares to the grantee (or transferred on the records of the Company with respect to uncertificated stock), and the grantee's name has been entered in the books of the Company as a stockholder.

(c) Termination. Except as may otherwise be provided by the Committee either in the Award Agreement or in writing after the Award Agreement is issued, a grantee's right in all Restricted Stock Units that have not vested shall automatically terminate upon the grantee's cessation of Service Relationship with the Company and any Subsidiary for any reason.

SECTION 9. TRANSFER RESTRICTIONS; COMPANY RIGHT OF FIRST REFUSAL; COMPANY REPURCHASE RIGHTS

(a) Restrictions on Transfer.

(i) Non-Transferability of Stock Options. Stock Options and, prior to exercise, the Shares issuable upon exercise of such Stock Option, shall not be transferable by the optionee otherwise than by will, or by the laws of descent and distribution, and all Stock Options shall be exercisable, during the optionee's lifetime, only by the optionee, or by the optionee's legal representative or guardian in the event of the optionee's incapacity. Notwithstanding the foregoing, the Committee, in its sole discretion, may provide in the Award Agreement regarding a given Stock Option that the optionee may transfer by gift, without consideration for the transfer, his or her Non-Qualified Stock Options to his or her family members (as defined in Rule 701 of the Securities Act), to trusts for the benefit of such family members, or to partnerships in which such family members are the only partners (to the extent such trusts or partnerships are considered "family members" for purposes of Rule 701 of the Securities Act), provided that the transferee agrees in writing with the Company to be bound by all of the terms and conditions of this Plan and the applicable Award Agreement, including the execution of a stock power upon the issuance of Shares. Stock Options, and the Shares issuable upon exercise of such Stock Options, shall be restricted as to any pledge, hypothecation, or other transfer, including any short position, any "put equivalent position" (as defined in the Exchange Act) or any "call equivalent position" (as defined in the Exchange Act) prior to exercise.

(ii) Shares. No Shares shall be sold, assigned, transferred, pledged, hypothecated, given away or in any other manner disposed of or encumbered, whether voluntarily or by operation of law, unless (i) the transfer is in compliance with the terms of the applicable Award Agreement, all applicable securities laws (including, without limitation, the Securities Act), and with the terms and conditions of this Section 9, (ii) the transfer does not cause the Company to become subject to the reporting requirements of the Exchange Act, and (iii) the transferee consents in writing to be bound by the provisions of the Plan and the Award Agreement, including this Section 9. In connection with any proposed transfer, the Committee may require the transferor to provide at the transferor's own expense an opinion of counsel to the transferor, satisfactory to the Committee, that such transfer is in compliance with all foreign, federal and state securities laws (including, without limitation, the Securities Act). Any attempted transfer of Shares not in accordance with the terms and conditions of this Section 9 shall be null and void, and the Company shall not reflect on its records any change in record ownership of any Shares as a result of any such transfer, shall otherwise refuse to recognize any such transfer and shall not in any way give effect to any such transfer of Shares. The Company shall be entitled to seek protective orders, injunctive relief and other remedies available at law or in equity including, without limitation, seeking specific performance or the rescission of any transfer not made in strict compliance with the provisions of this Section 9. Subject to the foregoing general provisions, and unless otherwise provided in the applicable Award Agreement, Shares may be transferred pursuant to the following specific terms and conditions (provided that with respect to any transfer of Restricted Stock, all vesting and forfeiture provisions shall continue to apply with respect to the original recipient):

(A) Transfers to Permitted Transferees. The Holder may transfer any or all of the Shares to one or more Permitted Transferees; *provided, however,* that following such transfer, such Shares shall continue to be subject to the terms of this Plan (including this Section 9) and such Permitted Transferee(s) shall, as a condition to any such transfer, deliver a written acknowledgment to that effect to the Company and shall deliver a stock power to the Company with respect to the Shares. Notwithstanding the foregoing, the Holder may not transfer any of the Shares to a Person whom the Company reasonably determines is a direct competitor or a potential competitor of the Company or any of its Subsidiaries.

(B) Transfers Upon Death. Upon the death of the Holder, any Shares then held by the Holder at the time of such death and any Shares acquired after the Holder's death by the Holder's legal representative shall be subject to the provisions of this Plan, and the Holder's estate, executors, administrators, personal representatives, heirs, legatees and distributees shall be obligated to convey such Shares to the Company or its assigns under the terms contemplated by the Plan and the Award Agreement.

(b) Right of First Refusal. In the event that a Holder desires at any time to sell or otherwise transfer all or any part of his or her Shares (other than shares of Restricted Stock which by their terms are not transferrable), the Holder first shall give written notice to the Company of the Holder's intention to make such transfer. Such notice shall state the number of Shares that the Holder proposes to sell (the "*Offered Shares*"), the price and the terms at which the proposed sale is to be made and the name and address of the proposed transferee. At any time within thirty (30) days after the receipt of such notice by the Company, the Company or its

assigns may elect to purchase all or any portion of the Offered Shares at the price and on the terms offered by the proposed transferee and specified in the notice. The Company or its assigns shall exercise this right by mailing or delivering written notice to the Holder within the foregoing thirty (30) day period. If the Company or its assigns elect to exercise its purchase rights under this Section 9(b), the closing for such purchase shall, in any event, take place within forty-five (45) days after the receipt by the Company of the initial notice from the Holder. In the event that the Company or its assigns do not elect to exercise such purchase right, or in the event that the Company or its assigns do not pay the full purchase price within such forty-five (45) day period, the Holder may, within sixty (60) days thereafter, sell the Offered Shares to the proposed transferee and at the same price and on the same terms as specified in the Holder's notice. Any Shares not sold to the proposed transferee shall remain subject to the Plan. If the Holder is a party to any stockholders agreements or other agreements with the Company and/or certain other of the Company's stockholders relating to the Shares, (i) the transferring Holder shall comply with the requirements of such stockholders agreements or other agreements relating to any proposed transfer of the Offered Shares, and (ii) any proposed transferee that purchases Offered Shares shall enter into such stockholders agreements or other agreements with the Company and/or certain of the Company's stockholders relating to the Offered Shares on the same terms and in the same capacity as the transferring Holder.

(c) Company's Right of Repurchase.

(i) Right of Repurchase for Unvested Shares Issued Upon the Exercise of an Option. Upon a Termination Event, the Company or its assigns shall have the right and option to repurchase from a Holder of Shares acquired upon exercise of a Stock Option which are still subject to a risk of forfeiture as of the Termination Event. Such repurchase rights may be exercised by the Company within the later of (A) six (6) months following the date of such Termination Event or (B) seven (7) months after the acquisition of Shares upon exercise of a Stock Option. The repurchase price shall be equal to the lower of the original per share price paid by the Holder, subject to adjustment as provided in Section 3(b) of the Plan, or the current Fair Market Value of such Shares as of the date the Company elects to exercise its repurchase rights.

(ii) Right of Repurchase With Respect to Restricted Stock. Upon a Termination Event, the Company or its assigns shall have the right and option to repurchase from a Holder of Shares received pursuant to a Restricted Stock Award any Shares that are still subject to a risk of forfeiture as of the Termination Event. Such repurchase right may be exercised by the Company within six (6) months following the date of such Termination Event. The repurchase price shall be the lower of the original per share purchase price paid by the Holder, subject to adjustment as provided in Section 3(b) of the Plan, or the current Fair Market Value of such Shares as of the date the Company elects to exercise its repurchase rights.

(iii) Procedure. Any repurchase right of the Company shall be exercised by the Company or its assigns by giving the Holder written notice on or before the last day of the repurchase period of its intention to exercise such repurchase right. Upon such notification, the Holder shall promptly surrender to the Company, free and clear of any liens or encumbrances, any certificates representing the Shares being purchased, together with a duly executed stock power for the transfer of such Shares to the Company or the Company's assignee or assignees.

Upon the Company's or its assignee's receipt of the certificates from the Holder, the Company or its assignee or assignees shall deliver to him, her or them a check for the applicable repurchase price; *provided, however*, that the Company may pay the repurchase price by offsetting and canceling any indebtedness then owed by the Holder to the Company.

(d) Drag Along Right. In the event the holders of a majority of the Company's equity securities then outstanding (the "*Majority Shareholders*") determine to enter into a Sale Event in a bona fide negotiated transaction (a "*Sale*"), with any non-Affiliate of the Company or any majority shareholder (in each case, the "*Buyer*"), a Holder of Shares, including any Permitted Transferee, shall be obligated to and shall upon the written request of the Majority Shareholders: (a) sell, transfer and deliver, or cause to be sold, transferred and delivered, to the Buyer, his or her Shares (including for this purpose all of such Holder's Shares that presently or as a result of any such transaction may be acquired upon the exercise of an Option (following the payment of the exercise price therefor)) on substantially the same terms applicable to the Majority Shareholders (with appropriate adjustments to reflect the conversion of convertible securities, the redemption of redeemable securities and the exercise of exercisable securities as well as the relative preferences and priorities of preferred stock); and (b) execute and deliver such instruments of conveyance and transfer and take such other action, including voting such Shares in favor of any Sale proposed by the Majority Shareholders and executing any purchase agreements, merger agreements, indemnity agreements, escrow agreements or related documents as the Majority Shareholders or the Buyer may reasonably require in order to carry out the terms and provisions of this Section 9(d).

(e) Escrow Arrangement.

(i) Escrow. In order to carry out the provisions of this Section 9 of this Plan more effectively, the Company shall hold any Shares issued pursuant to Awards granted under the Plan in escrow together with separate stock powers executed by the Holder in blank for transfer. The Company shall not dispose of the Shares except as otherwise provided in this Plan. In the event of any repurchase by the Company (or any of its assigns), the Company is hereby authorized by the Holder, as the Holder's attorney-in-fact, to date and complete the stock powers necessary for the transfer of the Shares being purchased and to transfer such Shares in accordance with the terms hereof. At such time as any Shares are no longer subject to the Company's repurchase and first refusal rights, the Company shall, at the written request of the Holder, deliver to the Holder a certificate representing such Shares with the balance of the Shares to be held in escrow pursuant to this Section.

(ii) Remedy. Without limitation of any other provision of this Plan or other rights, in the event that a Holder or any other Person is required to sell a Holder's Shares pursuant to the provisions of Sections 9(b) or (c) hereof and in the further event that he or she refuses or for any reason fails to deliver to the Company or its designated purchaser of such Shares the certificate or certificates evidencing such Shares together with a related stock power, the Company or such designated purchaser may deposit the applicable purchase price for such Shares with a bank designated by the Company, or with the Company's independent public accounting firm, as agent or trustee, or in escrow, for such Holder or other Person, to be held by such bank or accounting firm for the benefit of and for delivery to him, her, them or it, and/or, in its discretion, pay such purchase price by offsetting any indebtedness then owed by such Holder

as provided above. Upon any such deposit and/or offset by the Company or its designated purchaser of such amount and upon notice to the Person who was required to sell the Shares to be sold pursuant to the provisions of Sections 9(b) or (c), such Shares shall at such time be deemed to have been sold, assigned, transferred and conveyed to such purchaser, such Holder shall have no further rights thereto (other than the right to withdraw the payment thereof held in escrow, if applicable), and the Company shall record such transfer in its stock transfer book or in any appropriate manner.

(f) Lockup Provision. If requested by the Company, a Holder shall not sell or otherwise transfer or dispose of any Shares (including, without limitation, pursuant to Rule 144 under the Securities Act) held by him or her for such period following the effective date of a public offering by the Company of Shares as the Company shall specify reasonably and in good faith. If requested by the underwriter engaged by the Company, each Holder shall execute a separate letter confirming his or her agreement to comply with this Section.

(g) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding Shares are increased or decreased or are exchanged for a different number or kind of securities of the Company, the restrictions contained in this Section 9 shall apply with equal force to additional and/or substitute securities, if any, received by Holder in exchange for, or by virtue of his or her ownership of, Shares.

(h) Termination. The terms and provisions of Section 9(b) and Section 9(c) (except for the Company's right to repurchase Shares still subject to a risk of forfeiture upon a Termination Event) shall terminate upon the closing of the Company's Initial Public Offering or upon consummation of any Sale Event, in either case as a result of which Shares are registered under Section 12 of the Exchange Act and publicly-traded on any national security exchange.

SECTION 10. TAX WITHHOLDING

(a) Payment by Grantee. Each grantee shall, no later than the date as of which the value of an Award or of any Shares or other amounts received thereunder first becomes includable in the gross income of the grantee for income tax purposes, pay to the Company, or make arrangements satisfactory to the Committee regarding payment of, any Federal, state, or local taxes of any kind required by law to be withheld by the Company with respect to such income. The Company and any Subsidiary shall, to the extent permitted by law, have the right to deduct any such taxes from any payment of any kind otherwise due to the grantee. The Company's obligation to deliver stock certificates (or evidence of book entry) to any grantee is subject to and conditioned on any such tax withholding obligations being satisfied by the grantee.

(b) Payment in Stock. The Company's minimum required tax withholding obligation may be satisfied, in whole or in part, by the Company withholding from Shares to be issued pursuant to an Award a number of Shares having an aggregate Fair Market Value (as of the date the withholding is effected) that would satisfy the minimum withholding amount due.

SECTION 11. SECTION 409A AWARDS.

To the extent that any Award is determined to constitute “nonqualified deferred compensation” within the meaning of Section 409A (a “409A Award”), the Award shall be subject to such additional rules and requirements as may be specified by the Committee from time to time. In this regard, if any amount under a 409A Award is payable upon a “separation from service” (within the meaning of Section 409A) to a grantee who is considered a “specified employee” (within the meaning of Section 409A), then no such payment shall be made prior to the date that is the earlier of (i) six (6) months and one day after the grantee’s separation from service, or (ii) the grantee’s death, but only to the extent such delay is necessary to prevent such payment from being subject to interest, penalties and/or additional tax imposed pursuant to Section 409A. The Company makes no representation or warranty and shall have no liability to any grantee under the Plan or any other Person with respect to any penalties or taxes under Section 409A that are, or may be, imposed with respect to any Award.

SECTION 12. AMENDMENTS AND TERMINATION

The Board may, at any time, amend or discontinue the Plan and the Committee may, at any time, amend or cancel any outstanding Award for the purpose of satisfying changes in law or for any other lawful purpose, but no such action shall adversely affect rights under any outstanding Award without the consent of the holder of the Award. The Committee may exercise its discretion to reduce the exercise price of outstanding Stock Options or effect repricing through cancellation of outstanding Stock Options and by granting such holders new Awards in replacement of the cancelled Stock Options. To the extent determined by the Committee to be required either by the Code to ensure that Incentive Stock Options granted under the Plan are qualified under Section 422 of the Code or otherwise, Plan amendments shall be subject to approval by the Company stockholders entitled to vote at a meeting of stockholders. Nothing in this Section 12 shall limit the Board’s or Committee’s authority to take any action permitted pursuant to Section 3(c). The Board reserves the right to amend the Plan and/or the terms of any outstanding Stock Options to the extent reasonably necessary to comply with the requirements of the exemption pursuant to paragraph (f)(4) of Rule 12h-1 of the Exchange Act.

SECTION 13. STATUS OF PLAN

With respect to the portion of any Award that has not been exercised and any payments in cash, Stock or other consideration not received by a grantee, a grantee shall have no rights greater than those of a general creditor of the Company unless the Committee shall otherwise expressly so determine in connection with any Award.

SECTION 14. GENERAL PROVISIONS

(a) No Distribution; Compliance with Legal Requirements. The Committee may require each person acquiring Shares pursuant to an Award to represent to and agree with the Company in writing that such person is acquiring the Shares without a view to distribution thereof. No Shares shall be issued pursuant to an Award until all applicable securities law and other legal and stock exchange or similar requirements have been satisfied. The Committee may require the placing of such stop-orders and restrictive legends on certificates for Stock and Awards as it deems appropriate.

(b) Delivery of Stock Certificates. Stock certificates to grantees under the Plan shall be deemed delivered for all purposes when the Company or a stock transfer agent of the Company shall have mailed such certificates in the United States mail, addressed to the grantee, at the grantee's last known address on file with the Company; provided that stock certificates to be held in escrow pursuant to Section 9 of the Plan shall be deemed delivered when the Company shall have recorded the issuance in its records. Uncertificated Stock shall be deemed delivered for all purposes when the Company or a stock transfer agent of the Company shall have given to the grantee by electronic mail (with proof of receipt) or by United States mail, addressed to the grantee, at the grantee's last known address on file with the Company, notice of issuance and recorded the issuance in its records (which may include electronic "book entry" records).

(c) No Employment Rights. The adoption of the Plan and the grant of Awards do not confer upon any Person any right to continued employment or Service Relationship with the Company or any Subsidiary.

(d) Trading Policy Restrictions. Option exercises and other Awards under the Plan shall be subject to the Company's insider trading policy-related restrictions, terms and conditions as may be established by the Committee, or in accordance with policies set by the Committee, from time to time.

(e) Designation of Beneficiary. Each grantee to whom an Award has been made under the Plan may designate a beneficiary or beneficiaries to exercise any Award on or after the grantee's death or receive any payment under any Award payable on or after the grantee's death. Any such designation shall be on a form provided for that purpose by the Committee and shall not be effective until received by the Committee. If no beneficiary has been designated by a deceased grantee, or if the designated beneficiaries have predeceased the grantee, the beneficiary shall be the grantee's estate.

(f) Legend. Any certificate(s) representing the Shares shall carry substantially the following legend (and with respect to uncertificated Stock, the book entries evidencing such shares shall contain the following notation):

The transferability of this certificate and the shares of stock represented hereby are subject to the restrictions, terms and conditions (including repurchase and restrictions against transfers) contained in the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan and any agreements entered into thereunder by and between the company and the holder of this certificate (a copy of which is available at the offices of the company for examination).

(g) Information to Holders of Options. In the event the Company is relying on the exemption from the registration requirements of Section 12(g) of the Exchange Act contained in paragraph (f)(1) of Rule 12h-1 of the Exchange Act, the Company shall provide the information

described in Rule 701(e)(3), (4) and (5) of the Securities Act to all holders of Options in accordance with the requirements thereunder. The foregoing notwithstanding, the Company shall not be required to provide such information unless the optionholder has agreed in writing, on a form prescribed by the Company, to keep such information confidential.

SECTION 15. EFFECTIVE DATE OF PLAN

The Plan shall become effective upon adoption by the Board and shall be approved by stockholders in accordance with applicable state law and the Company's certificate of incorporation and bylaws within twelve (12) months thereafter. If the stockholders fail to approve the Plan within twelve (12) months after its adoption by the Board of Directors, then any Awards granted or sold under the Plan shall be rescinded and no additional grants or sales shall thereafter be made under the Plan. Subject to such approval by stockholders and to the requirement that no Shares may be issued hereunder prior to such approval, Stock Options and other Awards may be granted hereunder on and after adoption of the Plan by the Board. No grants of Stock Options and other Awards may be made hereunder after the tenth anniversary of the date the Plan is adopted by the Board or the date the Plan is approved by the Company's stockholders, whichever is earlier.

SECTION 16. GOVERNING LAW

This Plan, all Awards and any controversy arising out of or relating to this Plan and all Awards shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the State of Massachusetts.

DATE ADOPTED BY THE BOARD OF DIRECTORS: November 1, 2016

DATE APPROVED BY THE STOCKHOLDERS: November 1, 2016

Amendment to increase number of shares reserved under the Plan to 10,377,440 shares approved and adopted by the Board on April 21, 2017 and by the stockholders on April 21, 2017.

Amendment to increase number of shares reserved under the Plan to 15,247,857 shares approved and adopted by the Board on March 22, 2018 and by the stockholders on April 2, 2018.

**RESTRICTED STOCK AWARD NOTICE
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN**

Pursuant to the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "Plan"), Magenta Therapeutics, Inc., a Delaware corporation (together with any successor, the "Company"), hereby grants, sells and issues to the individual named below, the Shares at the Per Share Purchase Price, subject to the terms and conditions set forth in this Restricted Stock Award Notice (the "Award Notice"), the attached Restricted Stock Agreement (the "Agreement") and the Plan. The Grantee agrees to the provisions set forth herein and acknowledges that each such provision is a material condition of the Company's agreement to issue and sell the Shares to him or her. The Company hereby acknowledges receipt of \$[] in full payment for the Shares. All references to share prices and amounts herein shall be equitably adjusted to reflect stock splits, stock dividends, recapitalizations, mergers, reorganizations and similar changes affecting the capital stock of the Company, and any shares of capital stock of the Company received on or in respect of Shares in connection with any such event (including any shares of capital stock or any right, option or warrant to receive the same or any security convertible into or exchangeable for any such shares or received upon conversion of any such shares) shall be subject to this Agreement on the same basis and extent at the relevant time as the Shares in respect of which they were issued, and shall be deemed Shares as if and to the same extent they were issued at the date hereof.

Name of Grantee: (the "Grantee")
No. of Shares: Shares of Common Stock (the "Shares")
Grant Date: , 1
Date of Purchase of Shares: ,
Vesting Commencement Date: , (the "Vesting Commencement Date")
Per Share Purchase Price: \$ (the "Per Share Purchase Price")

Vesting Schedule: [25] percent of the Shares shall vest on the first anniversary of the Vesting Commencement Date; provided that the Grantee continues to have a Service Relationship with the Company at such time. Thereafter, the remaining [75] percent of the Shares shall vest in [36] equal monthly installments following the first anniversary of the Vesting Commencement Date until [], on which date, subject to the vesting conditions herein, all remaining Shares shall vest, provided the Grantee continues to have a Service Relationship with the Company at such time. Notwithstanding anything in the Agreement to the contrary in the case of a Sale Event, the Shares of Restricted Stock shall be treated as provided in Section 3(c) of the Plan.

¹ 83(b) Election must be made within 30 days of the date of sale or grant.

**RESTRICTED STOCK AGREEMENT
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN**

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Award Notice and the Plan.

1. Purchase and Sale of Shares; Vesting; Investment Representations.

(a) Purchase and Sale. The Company hereby sells to the Grantee, and the Grantee hereby purchases from the Company, the number of Shares set forth in the Award Notice for the Per Share Purchase Price.

(b) Vesting. Initially, all of the Shares are non-transferable and subject to a substantial risk of forfeiture and are Shares of Restricted Stock. The risk of forfeiture shall lapse with respect to the Shares on the respective dates indicated on the Vesting Schedule set forth in the Award Notice.

(c) Investment Representations. In connection with the purchase and sale of the Shares contemplated by Section 1(a) above, the Grantee hereby represents and warrants to the Company as follows:

(i) The Grantee is purchasing the Shares for the Grantee's own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) The Grantee has had such an opportunity as he or she has deemed adequate to obtain from the Company such information as is necessary to permit him or her to evaluate the merits and risks of the Grantee's investment in the Company and has consulted with the Grantee's own advisers with respect to the Grantee's investment in the Company.

(iii) The Grantee has sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) The Grantee can afford a complete loss of the value of the Shares and is able to bear the economic risk of holding such Shares for an indefinite period.

(v) The Grantee understands that the Shares are not registered under the Act (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Act and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirements thereof). The Grantee further acknowledges that certificates representing the Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

(vi) The Grantee has read and understands the Plan and acknowledges and agrees that the Shares are subject to all of the relevant terms of the Plan, including without limitation, the transfer restrictions set forth in Section 9 of the Plan.

(vii) The Grantee understands and agrees that the Company has a right of first refusal with respect to the Shares pursuant to Section 9(b) of the Plan.

(viii) The Grantee understands and agree that the Company has certain repurchase rights with respect to the Shares pursuant to Section 9(c) of the Plan.

(ix) The Grantee understands and agrees that the Grantee may not sell or otherwise transfer or dispose of the Shares for a period of time following the effective date of a public offering by the Company as described in Section 9(f) of the Plan.

2. Repurchase Right. Upon a Termination Event, the Company shall have the right to repurchase Shares of Restricted Stock that are unvested as of the date of such Termination Event as set forth in Section 9(c) of the Plan.

3. Restrictions on Transfer of Shares. The Shares (whether or not vested) shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan

4. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Restricted Stock Award shall be subject to and governed by all the terms and conditions of the Plan.

5. Miscellaneous Provisions.

(a) Record Owner; Dividends. The Grantee and any Permitted Transferees, during the duration of this Agreement, shall be considered the record owners of and shall be entitled to vote the Shares if and to the extent the Shares are entitled to voting rights. The Grantee and any Permitted Transferees shall be entitled to receive all dividends and any other distributions declared on the Shares; provided, however, that the Company is under no duty to declare any such dividends or to make any such distribution.

(b) Section 83(b) Election. The Grantee shall consult with the Grantee's tax advisor to determine whether it would be appropriate for the Grantee to make an election under Section 83(b) of the Code with respect to this Award. Any such election must be filed with the Internal Revenue Service within 30 days of the date of this Award. If the Grantee makes an election under Section 83(b) of the Code, the Grantee shall give prompt notice to the Company (and provide a copy of such election to the Company).

(c) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(d) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Grantee.

(e) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(f) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(g) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(h) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Grantee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(i) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(j) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

(k) Integration. This Agreement constitutes the entire agreement between the parties with respect to this Award and supersedes all prior agreements and discussions between the parties concerning such subject matter. The execution of this Agreement satisfies in full any express or implied obligation, agreement or promise by or on the part of the Company to grant or issue to the Grantee any equity interest in the Company pursuant to any offer letter, employment agreement, consulting or other written or oral agreement or arrangement as of the Grant Date.

6. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or the Shares, this Agreement, or the breach, termination or validity of the Plan, the Shares or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1—16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Grantee, each party to the Agreement and any other holder of Shares issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 6 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each

other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Restricted Stock Agreement is hereby accepted and the terms and conditions thereof are hereby agreed to by the undersigned as of the date of purchase of Shares above written.

MAGENTA THERAPEUTICS, INC.

By: _____

Name:

Title:

Address:

The undersigned hereby acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof and understands that the Shares granted hereby are subject to the terms of the Plan and of this Agreement. This Agreement is hereby accepted, and the terms and conditions of the Plan, the Award Notice and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS SET FORTH IN SECTION 6 OF THIS AGREEMENT, are hereby agreed to, by the undersigned as of the date first above written.

GRANTEE:

Name:

Address:

[SPOUSE'S CONSENT²

I acknowledge that I have read the foregoing Restricted Stock Agreement and understand the contents thereof.

_____]

² A spouse's consent is required only if the Grantee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, New Mexico, Nevada, Texas, Washington and Wisconsin.

**INCENTIVE STOCK OPTION GRANT NOTICE
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN**

Pursuant to the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "Plan"), Magenta Therapeutics, Inc., a Delaware corporation (together with any successor, the "Company"), has granted to the individual named below, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value \$0.001 per share ("Common Stock"), of the Company indicated below (the "Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Incentive Stock Option Grant Notice (the "Grant Notice"), the attached Incentive Stock Option Agreement (the "Agreement") and the Plan. This Stock Option is intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code"). To the extent that any portion of the Stock Option does not so qualify, it shall be deemed a non-qualified stock option.

Name of Optionee: (the "Optionee")

No. of Shares: Shares of Common Stock

Grant Date:

Vesting Commencement Date: (the "Vesting Commencement Date")

Expiration Date: (the "Expiration Date")

Option Exercise Price/Share: \$ (the "Option Exercise Price")

Vesting Schedule: [25] percent of the Shares shall vest and become exercisable on the first anniversary of the Vesting Commencement Date; provided that the Optionee continues to have a Service Relationship with the Company at such time. Thereafter, the remaining [75] percent of the Shares shall vest and become exercisable in [36] equal monthly installments following the first anniversary of the Vesting Commencement Date, provided the Optionee continues to have a Service Relationship with the Company on each vesting date. [Notwithstanding anything in the Agreement to the contrary, in the case of a Sale Event, this Stock Option and the Shares shall be treated as provided in Section 3(c) of the Plan] **[provided; however INSERT ANY ACCELERATED VESTING PROVISION HERE].**

Attachments: Incentive Stock Option Agreement, 2016 Stock Option and Grant Plan

**INCENTIVE STOCK OPTION AGREEMENT
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN**

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Grant Notice and the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Except as set forth below, and subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall be vested and exercisable on the respective dates indicated below:

(i) This Stock Option shall initially be unvested and unexercisable.

(ii) This Stock Option shall vest and become exercisable in accordance with the Vesting Schedule set forth in the Grant Notice.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case, to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or Disability, this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or Disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or Disability, and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees. Any portion of this Stock Option that is not vested and exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

(d) It is understood and intended that this Stock Option is intended to qualify as an “incentive stock option” as defined in Section 422 of the Code to the extent permitted under applicable law. Accordingly, the Optionee understands that in order to obtain the benefits of an incentive stock option under Section 422 of the Code, no sale or other disposition may be made of Shares for which incentive stock option treatment is desired within the one-year period beginning on the day after the day of the transfer of such Shares to him or her, nor within the two-year period beginning on the day after Grant Date of this Stock Option and further that this Stock Option must be exercised within three months after termination of employment as an employee (or 12 months in the case of death or disability) to qualify as an incentive stock option. If the Optionee disposes (whether by sale, gift, transfer or otherwise) of any such Shares within either of these periods, he or she will notify the Company within 30 days after such disposition. The Optionee also agrees to provide the Company with any information concerning any such dispositions required by the Company for tax purposes. Further, to the extent this Stock Option and any other incentive stock options of the Optionee having an aggregate Fair Market Value in excess of \$100,000 (determined as of the Grant Date) first become exercisable in any year, such options will not qualify as incentive stock options.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an “Exercise Notice”) in the form of Appendix A hereto indicating his or her election to purchase some or all of the Shares with respect to which this Stock Option is then exercisable. Such notice shall specify the number of Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Section 5 of the Plan, subject to the limitations contained in such Section of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Stock Option is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee’s lifetime only by the Optionee (or by the Optionee’s guardian or personal representative in the event of the Optionee’s incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee’s Stock Option in the event of the Optionee’s death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee’s death.

5. Restrictions on Transfer of Shares. The Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of securities of the Company, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, this Stock Option or Shares acquired pursuant thereto.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

(j) Integration. This Agreement constitutes the entire agreement between the parties with respect to this Stock Option and supersedes all prior agreements and discussions between the parties concerning such subject matter. The execution of this Agreement satisfies in full any express or implied obligation, agreement or promise by or on the part of the Company to grant or issue to the Grantee any equity interest in the Company pursuant to any offer letter, employment agreement, consulting or other written or oral agreement or arrangement as of the Grant Date.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1 16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Shares issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

MAGENTA THERAPEUTICS, INC.

By: _____

Name:

Title:

Address:

The undersigned hereby acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that this Stock Option is subject to the terms of the Plan and of this Agreement. This Agreement is hereby accepted, and the terms and conditions of the Plan, the Grant Notice and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS SET FORTH IN SECTION 7 OF THIS AGREEMENT, are hereby agreed to, by the undersigned as of the date first above written.

OPTIONEE:

Name:

Address:

[SPOUSE'S CONSENT³

I acknowledge that I have read the foregoing Incentive Stock Option Agreement and understand the contents thereof.

_____]

³ A spouse's consent is recommended only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary's Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Magenta Therapeutics, Inc.

Attention: [_____]

Pursuant to the terms of the grant notice and stock option agreement between the undersigned and Magenta Therapeutics, Inc. (the “Company”) dated (the “Agreement”) under the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan, I, [Insert Name], hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of \$ _____ representing the purchase price for [Fill in number of Shares] Shares. I have chosen the following form(s) of payment:

- 1. Cash
- 2. Certified or bank check payable to Magenta Therapeutics, Inc.
- 3. Other (as referenced in the Agreement and described in the Plan (please describe))
_____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period of time.

(v) I understand that the Shares may not be registered under the Securities Act of 1933 (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or “blue sky” laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or “blue sky” laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

(vi) I have read and understand the Plan and acknowledge and agree that the Shares are subject to all of the relevant terms of the Plan, including without limitation, the transfer restrictions set forth in Section 9 of the Plan.

(vii) I understand and agree that the Company has a right of first refusal with respect to the Shares pursuant to Section 9(b) of the Plan.

(viii) I understand and agree that the Company has certain repurchase rights with respect to the Shares pursuant to Section 9(c) of the Plan.

(ix) I understand and agree that I may not sell or otherwise transfer or dispose of the Shares for a period of time following the effective date of a public offering by the Company as described in Section 9(f) of the Plan.

Sincerely yours,

Name: _____

Address: _____

Date: _____

**NON-QUALIFIED STOCK OPTION GRANT NOTICE
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN**

Pursuant to the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan (the "Plan"), Magenta Therapeutics, Inc., a Delaware corporation (together with any successor, the "Company"), has granted to the individual named below, an option (the "Stock Option") to purchase on or prior to the Expiration Date, or such earlier date as is specified herein, all or any part of the number of shares of Common Stock, par value \$0.001 per share ("Common Stock"), of the Company indicated below (the "Shares"), at the Option Exercise Price per share, subject to the terms and conditions set forth in this Non-Qualified Stock Option Grant Notice (the "Grant Notice"), the attached Non-Qualified Stock Option Agreement (the "Agreement") and the Plan. This Stock Option is not intended to qualify as an "incentive stock option" as defined in Section 422(b) of the Internal Revenue Code of 1986, as amended from time to time (the "Code").

Name of Optionee: (the "Optionee")
No. of Shares: Shares of Common Stock
Grant Date:
Vesting Commencement Date: (the "Vesting Commencement Date")
Expiration Date: (the "Expiration Date")
Option Exercise Price/Share: \$ (the "Option Exercise Price")
Vesting Schedule: [25] percent of the Shares shall vest and become exercisable on the first anniversary of the Vesting Commencement Date; provided that the Optionee continues to have a Service Relationship with the Company at such time. Thereafter, the remaining [75] percent of the Shares shall vest and become exercisable in [36] equal monthly installments following the first anniversary of the Vesting Commencement Date, provided the Optionee continues to have a Service Relationship with the Company on each vesting date. [Notwithstanding anything in the Agreement to the contrary, in the case of a Sale Event, this Stock Option and the Shares shall be treated as provided in Section 3(c) of the Plan] **[provided; however INSERT ANY ACCELERATED VESTING PROVISION HERE].**

Attachments: Non-Qualified Stock Option Agreement, 2016 Stock Option and Grant Plan

**NON-QUALIFIED STOCK OPTION AGREEMENT
UNDER THE MAGENTA THERAPEUTICS, INC.
2016 STOCK OPTION AND GRANT PLAN**

All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Grant Notice and the Plan.

1. Vesting, Exercisability and Termination.

(a) No portion of this Stock Option may be exercised until such portion shall have vested and become exercisable.

(b) Except as set forth below, and subject to the determination of the Committee in its sole discretion to accelerate the vesting schedule hereunder, this Stock Option shall be vested and exercisable on the respective dates indicated below:

(i) This Stock Option shall initially be unvested and unexercisable.

(ii) This Stock Option shall vest and become exercisable in accordance with the Vesting Schedule set forth in the Grant Notice.

(c) Termination. Except as may otherwise be provided by the Committee, if the Optionee's Service Relationship is terminated, the period within which to exercise this Stock Option will be subject to earlier termination as set forth below (and if not exercised within such period, shall thereafter terminate subject, in each case, to Section 3(c) of the Plan):

(i) Termination Due to Death or Disability. If the Optionee's Service Relationship terminates by reason of such Optionee's death or Disability, this Stock Option may be exercised, to the extent exercisable on the date of such termination, by the Optionee, the Optionee's legal representative or legatee for a period of 12 months from the date of death or Disability or until the Expiration Date, if earlier.

(ii) Other Termination. If the Optionee's Service Relationship terminates for any reason other than death or Disability, and unless otherwise determined by the Committee, this Stock Option may be exercised, to the extent exercisable on the date of termination, for a period of 90 days from the date of termination or until the Expiration Date, if earlier; provided however, if the Optionee's Service Relationship is terminated for Cause, this Stock Option shall terminate immediately upon the date of such termination.

For purposes hereof, the Committee's determination of the reason for termination of the Optionee's Service Relationship shall be conclusive and binding on the Optionee and his or her representatives or legatees and any Permitted Transferee. Any portion of this Stock Option that is not vested and exercisable on the date of termination of the Service Relationship shall terminate immediately and be null and void.

2. Exercise of Stock Option.

(a) The Optionee may exercise this Stock Option only in the following manner: Prior to the Expiration Date, the Optionee may deliver a Stock Option exercise notice (an "Exercise Notice") in the form of Appendix A hereto indicating his or her election to purchase some or all of the Shares with respect to which this Stock Option is then exercisable. Such notice shall specify the number of Shares to be purchased. Payment of the purchase price may be made by one or more of the methods described in Section 5 of the Plan, subject to the limitations contained in such Section of the Plan, including the requirement that the Committee specifically approve in advance certain payment methods.

(b) Notwithstanding any other provision hereof or of the Plan, no portion of this Stock Option shall be exercisable after the Expiration Date.

3. Incorporation of Plan. Notwithstanding anything herein to the contrary, this Stock Option shall be subject to and governed by all the terms and conditions of the Plan.

4. Transferability of Stock Option. This Stock Option is personal to the Optionee and is not transferable by the Optionee in any manner other than by will or by the laws of descent and distribution. The Stock Option may be exercised during the Optionee's lifetime only by the Optionee (or by the Optionee's guardian or personal representative in the event of the Optionee's incapacity). The Optionee may elect to designate a beneficiary by providing written notice of the name of such beneficiary to the Company, and may revoke or change such designation at any time by filing written notice of revocation or change with the Company; such beneficiary may exercise the Optionee's Stock Option in the event of the Optionee's death to the extent provided herein. If the Optionee does not designate a beneficiary, or if the designated beneficiary predeceases the Optionee, the legal representative of the Optionee may exercise this Stock Option to the extent provided herein in the event of the Optionee's death.

5. Restrictions on Transfer of Shares. The Shares acquired upon exercise of the Stock Option shall be subject to certain transfer restrictions and other limitations including, without limitation, the provisions contained in Section 9 of the Plan.

6. Miscellaneous Provisions.

(a) Equitable Relief. The parties hereto agree and declare that legal remedies may be inadequate to enforce the provisions of this Agreement and that equitable relief, including specific performance and injunctive relief, may be used to enforce the provisions of this Agreement.

(b) Adjustments for Changes in Capital Structure. If, as a result of any reorganization, recapitalization, reincorporation, reclassification, stock dividend, stock split, reverse stock split or other similar change in the Common Stock, the outstanding shares of Common Stock are increased or decreased or are exchanged for a different number or kind of securities of the Company, the restrictions contained in this Agreement shall apply with equal force to additional and/or substitute securities, if any, received by the Optionee in exchange for, or by virtue of his or her ownership of, this Stock Option or Shares acquired pursuant thereto.

(c) Change and Modifications. This Agreement may not be orally changed, modified or terminated, nor shall any oral waiver of any of its terms be effective. This Agreement may be changed, modified or terminated only by an agreement in writing signed by the Company and the Optionee.

(d) Governing Law. This Agreement shall be governed by and construed in accordance with the General Corporation Law of the State of Delaware as to matters within the scope thereof, and as to all other matters shall be governed by and construed in accordance with the internal laws of the Commonwealth of Massachusetts, without regard to conflict of law principles that would result in the application of any law other than the law of the Commonwealth of Massachusetts.

(e) Headings. The headings are intended only for convenience in finding the subject matter and do not constitute part of the text of this Agreement and shall not be considered in the interpretation of this Agreement.

(f) Saving Clause. If any provision(s) of this Agreement shall be determined to be illegal or unenforceable, such determination shall in no manner affect the legality or enforceability of any other provision hereof.

(g) Notices. All notices, requests, consents and other communications shall be in writing and be deemed given when delivered personally, by telex or facsimile transmission or when received if mailed by first class registered or certified mail, postage prepaid. Notices to the Company or the Optionee shall be addressed as set forth underneath their signatures below, or to such other address or addresses as may have been furnished by such party in writing to the other.

(h) Benefit and Binding Effect. This Agreement shall be binding upon and shall inure to the benefit of the parties hereto, their respective successors, assigns, and legal representatives. The Company has the right to assign this Agreement, and such assignee shall become entitled to all the rights of the Company hereunder to the extent of such assignment.

(i) Counterparts. For the convenience of the parties and to facilitate execution, this Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same document.

(j) Integration. This Agreement constitutes the entire agreement between the parties with respect to this Stock Option and supersedes all prior agreements and discussions between the parties concerning such subject matter. The execution of this Agreement satisfies in full any express or implied obligation, agreement or promise by or on the part of the Company to grant or issue to the Grantee any equity interest in the Company pursuant to any offer letter, employment agreement, consulting or other written or oral agreement or arrangement as of the Grant Date.

7. Dispute Resolution.

(a) Except as provided below, any dispute arising out of or relating to the Plan or this Stock Option, this Agreement, or the breach, termination or validity of the Plan, this Stock Option or this Agreement, shall be finally settled by binding arbitration conducted expeditiously in accordance with the J.A.M.S./Endispute Comprehensive Arbitration Rules and Procedures (the "J.A.M.S. Rules"). The arbitration shall be governed by the United States Arbitration Act, 9 U.S.C. Sections 1-16, and judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. The place of arbitration shall be Boston, Massachusetts.

(b) The arbitration shall commence within 60 days of the date on which a written demand for arbitration is filed by any party hereto. In connection with the arbitration proceeding, the arbitrator shall have the power to order the production of documents by each party and any third-party witnesses. In addition, each party may take up to three depositions as of right, and the arbitrator may in his or her discretion allow additional depositions upon good cause shown by the moving party. However, the arbitrator shall not have the power to order the answering of interrogatories or the response to requests for admission. In connection with any arbitration, each party to the arbitration shall provide to the other, no later than seven business days before the date of the arbitration, the identity of all persons that may testify at the arbitration and a copy of all documents that may be introduced at the arbitration or considered or used by a party's witness or expert. The arbitrator's decision and award shall be made and delivered within six months of the selection of the arbitrator. The arbitrator's decision shall set forth a reasoned basis for any award of damages or finding of liability. The arbitrator shall not have power to award damages in excess of actual compensatory damages and shall not multiply actual damages or award punitive damages, and each party hereby irrevocably waives any claim to such damages.

(c) The Company, the Optionee, each party to the Agreement and any other holder of Shares issued pursuant to this Agreement (each, a "Party") covenants and agrees that such party will participate in the arbitration in good faith. This Section 7 applies equally to requests for temporary, preliminary or permanent injunctive relief, except that in the case of temporary or preliminary injunctive relief any party may proceed in court without prior arbitration for the limited purpose of avoiding immediate and irreparable harm.

(d) Each Party (i) hereby irrevocably submits to the jurisdiction of any United States District Court of competent jurisdiction for the purpose of enforcing the award or decision in any such proceeding, (ii) hereby waives, and agrees not to assert, by way of motion, as a defense, or otherwise, in any such suit, action or proceeding, any claim that it is not subject personally to the jurisdiction of the above named courts, that its property is exempt or immune from attachment or execution (except as protected by applicable law), that the suit, action or proceeding is brought in an inconvenient forum, that the venue of the suit, action or proceeding is improper or that this Agreement or the subject matter hereof may not be enforced in or by such court, and (iii) hereby waives and agrees not to seek any review by any court of any other jurisdiction which may be called upon to grant an enforcement of the judgment of any such court. Each Party hereby consents to service of process by registered mail at the address to which notices are to be given. Each Party agrees that its, his or her submission to jurisdiction and its, his or her consent to service of process by mail is made for the express benefit of each other Party. Final judgment against any Party in any such action, suit or proceeding may be enforced in other jurisdictions by suit, action or proceeding on the judgment, or in any other manner provided by or pursuant to the laws of such other jurisdiction.

[SIGNATURE PAGE FOLLOWS]

The foregoing Agreement is hereby accepted and the terms and conditions thereof hereby agreed to by the undersigned as of the date first above written.

MAGENTA THERAPEUTICS, INC.

By: _____

Name:

Title:

Address:

The undersigned hereby acknowledges receiving and reviewing a copy of the Plan, including, without limitation, Section 9 thereof, and understands that this Stock Option is subject to the terms of the Plan and of this Agreement. This Agreement is hereby accepted, and the terms and conditions of the Plan, the Grant Notice and this Agreement, SPECIFICALLY INCLUDING THE ARBITRATION PROVISIONS SET FORTH IN SECTION 7 OF THIS AGREEMENT, are hereby agreed to, by the undersigned as of the date first above written.

OPTIONEE:

Name:

Address:

[SPOUSE'S CONSENT⁴

I acknowledge that I have read the foregoing Non-Qualified Stock Option Agreement and understand the contents thereof.

_____]

⁴ A spouse's consent is recommended only if the Optionee's state of residence is one of the following community property states: Arizona, California, Idaho, Louisiana, Nevada, New Mexico, Texas, Washington and Wisconsin.

DESIGNATED BENEFICIARY:

Beneficiary's Address:

Appendix A

STOCK OPTION EXERCISE NOTICE

Magenta Therapeutics, Inc.

Attention: [_____]

Pursuant to the terms of the grant notice and stock option agreement between the undersigned and Magenta Therapeutics, Inc. (the "Company") dated (the "Agreement") under the Magenta Therapeutics, Inc. 2016 Stock Option and Grant Plan, I, [Insert Name], hereby [Circle One] partially/fully exercise such option by including herein payment in the amount of \$ _____ representing the purchase price for [Fill in number of Shares] Shares. I have chosen the following form(s) of payment:

- [1. Cash]
- [2. Certified or bank check payable to Magenta Therapeutics, Inc.]
- [3. Other (as referenced in the Agreement and described in the Plan (please describe))]
_____.

In connection with my exercise of the option as set forth above, I hereby represent and warrant to the Company as follows:

(i) I am purchasing the Shares for my own account for investment only, and not for resale or with a view to the distribution thereof.

(ii) I have had such an opportunity as I have deemed adequate to obtain from the Company such information as is necessary to permit me to evaluate the merits and risks of my investment in the Company and have consulted with my own advisers with respect to my investment in the Company.

(iii) I have sufficient experience in business, financial and investment matters to be able to evaluate the risks involved in the purchase of the Shares and to make an informed investment decision with respect to such purchase.

(iv) I can afford a complete loss of the value of the Shares and am able to bear the economic risk of holding such Shares for an indefinite period of time.

(v) I understand that the Shares may not be registered under the Securities Act of 1933 (it being understood that the Shares are being issued and sold in reliance on the exemption provided in Rule 701 thereunder) or any applicable state securities or "blue sky" laws and may not be sold or otherwise transferred or disposed of in the absence of an effective registration statement under the Securities Act of 1933 and under any applicable state securities or "blue sky" laws (or exemptions from the registration requirement thereof). I further acknowledge that certificates representing Shares will bear restrictive legends reflecting the foregoing and/or that book entries for uncertificated Shares will include similar restrictive notations.

(vi) I have read and understand the Plan and acknowledge and agree that the Shares are subject to all of the relevant terms of the Plan, including without limitation, the transfer restrictions set forth in Section 9 of the Plan.

(vii) I understand and agree that the Company has a right of first refusal with respect to the Shares pursuant to Section 9(b) of the Plan.

(viii) I understand and agree that the Company has certain repurchase rights with respect to the Shares pursuant to Section 9(c) of the Plan.

(ix) I understand and agree that I may not sell or otherwise transfer or dispose of the Shares for a period of time following the effective date of a public offering by the Company as described in Section 9(f) of the Plan.

Sincerely yours,

Name:

Address:

Date: _____