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

FORM 10-K

(Mark One)

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended December 31, 2016

or

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from _____ to _____

Commission file number: 001-36751

Histogenics Corporation
(Exact name of registrant as specified in its charter)

Delaware	**04-3522315**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification Number)**
830 Winter Street, 3rd Floor Waltham, Massachusetts	**02451**
(Address of principal executive offices)	**(Zip Code)**

(781) 547-7900
(Registrant's telephone number, including area code)

Securities registered pursuant to Section 12(b) of the Act:

Common Stock, $0.01 par value per share	**The NASDAQ Stock Market LLC**
(Title of each class)	**(Name of each exchange on which registered)**

Securities registered pursuant to Section 12(g) of the Act:

None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☐ No ☒

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically and posted on its corporate Website, if any, every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K (§ 229.405 of this chapter) is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☐

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

Large accelerated filer	☐	Accelerated filer	☐
Non-accelerated filer	☐ (Do not check if a smaller reporting company)	Smaller reporting company	☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Act). Yes ☐ No ☒

As of June 30, 2016, the last business day of the registrant's last completed second quarter, the aggregate market value of the Common Stock held by non-affiliates of the registrant was approximately $14.9 million, based on the closing price of the registrant's Common Stock, as reported by the NASDAQ Global Market. For purposes of this disclosure, shares of Common Stock held by each executive officer, director, stockholders known by the registrant to be affiliates of such executive officers and directors based on public filings and stockholders known by the registrant to own 20% or more of the outstanding stock based on public filings and other information known to the registrant have been excluded since such persons may be deemed affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

As of March 14, 2017 there were 22,168,090 shares of the registrant's Common Stock issued and outstanding.

DOCUMENTS INCORPORATED BY REFERENCE

Specified portions of the registrant's proxy statement with respect to the registrant's 2017 Annual Meeting of Stockholders, which is to be filed pursuant to Regulation 14A within 120 days after the end of the registrant's fiscal year ended December 31, 2016, are incorporated by reference into Part III of this Form 10-K.

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Histogenics Corporation

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PART I

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Various statements in this report are “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements involve substantial risks and uncertainties. All statements, other than statements of historical facts, included in this report regarding our strategy, future operations, future financial position, future revenues, projected costs, prospects, plans and objectives of management are forward-looking statements. These statements are subject to risks and uncertainties and are based on information currently available to our management. Words such as, but not limited to, “anticipate,” “believe,” “contemplates,” “continue,” “could,” “design,” “estimate,” “expect,” “intend,” “likely,” “may,” “ongoing,” “plan,” “potential,” “predict,” “project,” “will,” “would,” “seek,” “should,” “target,” or the negative of these terms and similar expressions or words, identify forward-looking statements. The events and circumstances reflected in our forward-looking statements may not occur and actual results could differ materially from those projected in our forward-looking statements. Meaningful factors which could cause actual results to differ include, but are not limited to:

- the timing of enrollment commencement and completion of our clinical trials;
- the timing and success of preclinical studies and clinical trials conducted by us and our development partners;
- our securities’ or industry analysts’ expectations regarding the timing and success of enrollment in our clinical trials;
- the scope, progress and expansion and costs of developing and commercializing our product candidates;
- our expectations regarding our expenses and revenues, the sufficiency of our cash resources, and the timing of future profitability, if at all;
- our need for additional financing and our ability to raise additional funds on commercially reasonable terms;
- our ability to establish and maintain development and commercialization partnerships;
- our technology manufacturing location and partners;
- our ability to adequately manufacture our product candidates for our clinical trials and the raw materials utilized therein;
- the ability to obtain and maintain regulatory approval of our product candidates and the labeling for any approved products;
- our ability to obtain and maintain intellectual property protection for our product candidates and our regenerative medicine platform;
- our expectations regarding competition, including the actions of competitors and the perceived relative performance in the marketplace of NeoCart as compared to competitive products;
- the size and growth of the potential markets for our product candidates and the ability to serve those markets;
- our ability to manufacture our product candidates at a commercial scale to serve those markets, if approved;
- the rate and degree of reimbursement and market acceptance of any of our product candidates;
- our anticipated growth strategies;
- the anticipated trends and challenges in our business and the market in which we operate;

- our ability to attract or retain key personnel;
- our ability to operate our business in compliance with the covenants and restrictions that we are subject to under our loan and security agreement;
- regulatory developments in the United States and foreign countries; and
- our plans for the use of our cash and cash equivalents.

All written and verbal forward-looking statements attributable to us or any person acting on our behalf are expressly qualified in their entirety by the cautionary statements contained or referred to in this section. We caution investors not to rely too heavily on the forward-looking statements we make or that are made on our behalf. We undertake no obligation, and specifically decline any obligation, to update or revise publicly any forward-looking statements, whether as a result of new information, future events or otherwise. You are advised, however, to consult any further disclosures we make on related subjects in any annual, quarterly or current reports that we may file with the Securities and Exchange Commission.

We encourage you to read the discussion and analysis of our financial condition and our consolidated financial statements contained in this annual report on Form 10-K. We also encourage you to read Item 1A of Part 1 of this annual report on Form 10-K, entitled “Risk Factors,” which contains a more complete discussion of the risks and uncertainties associated with our business. In addition to the risks described above and in Item 1A of this report, other unknown or unpredictable factors also could affect our results. There can be no assurance that the actual results or developments anticipated by us will be realized or, even if substantially realized, that they will have the expected consequences to, or effects on, us. Therefore no assurance can be given that the outcomes stated in such forward-looking statements and estimates will be achieved.

As used in this annual report on Form 10-K, the terms “Histogenics,” “Company,” “registrant,” “we,” “us,” and “our” mean Histogenics Corporation and its subsidiaries unless the context indicates otherwise.

INDUSTRY AND MARKET DATA

We obtained the industry, market and competitive position data used throughout this annual report on Form 10-K from our own internal estimates and research, as well as from industry and general publications, in addition to research, surveys and studies conducted by third parties in certain instances. Internal estimates are derived from publicly-available information released by industry analysts and third-party sources, our internal research and our industry experience, and are based on assumptions made by us based on such data and our knowledge of our industry and market, which we believe to be reasonable. In addition, while we believe the industry, market and competitive position data included in this annual report on Form 10-K are reliable and are based on reasonable assumptions, such data involves risks and uncertainties and are subject to change based on various factors, including those discussed in “Risk Factors.” These and other factors could cause results to differ materially from those expressed in the estimates made by the independent parties and by us.

ITEM 1. *BUSINESS*

Overview

We are a regenerative medicine company focused on developing and commercializing products in the musculoskeletal segment of the marketplace. Our first product candidate, NeoCart®, is an innovative tissue implant that utilizes various aspects of our regenerative medicine platform to treat tissue injury in the field of orthopedics, specifically cartilage damage in the knee. We are currently investigating NeoCart in a 245 patient, Phase 3 clinical trial. Joint, or articular, cartilage covers the ends of bones and allows for joints to glide smoothly with minimal friction. Cartilage damage, or chondral defects, can be caused by acute trauma, such as a bad fall or sports-related injury, or by repetitive trauma, such as general wear over time. Unlike other tissues in the body, joint cartilage has no innate ability to repair itself, making any injury permanent. Left untreated, even a small defect can expand in size and progress to debilitating osteoarthritis, ultimately necessitating a joint replacement procedure. An estimated 27 million people in the United States and 630 million people worldwide suffer from osteoarthritis. Compelling demographic trends, such as the growing population of aging yet active individuals and rising rates of obesity, are expected to be key drivers in the continued growth of osteoarthritis occurrence. Osteoarthritis is more common in adults over the age of 50, but the condition and precursors of the condition can be observed much earlier, and cartilage damage is believed to be one of the leading contributors of this disease.

We have no products that are approved for sale in the United States and currently we are not selling any other products that may be approved for sale in other jurisdictions. NeoCart is based on our regenerative medicine platform, which combines expertise in the following areas:

- Cell therapy and processing: the handling of a tissue biopsy and the extraction, isolation and expansion of the cells;
- Biomaterials and Scaffold: three-dimensional biomaterials structures that enable the proper distribution of cells and organize cells in their natural environment to support tissue formation;
- Tissue engineering: the use of a combination of cells, engineering and biomaterials to improve or replace biological functions; and
- Bioadhesives: natural, biocompatible materials that act as adhesives for biological tissue and allow for natural cell and tissue infiltration and integration with native cells.

NeoCart is a cartilage-like implant created using a patient’s own cartilage cells through a series of tissue engineering processes. First, the patient’s cells are separated from a tissue biopsy specimen extracted from the patient and multiplied in our laboratory. The cells are then infused into our proprietary scaffold that provides structure for the developing implant. Before NeoCart is implanted in a patient, the cell- and scaffold construct undergoes a bioengineering process in our Tissue Engineering Processor (TEP). Our TEP is designed to mimic the conditions found in a joint so that the implant is prepared to begin functioning like normal healthy cartilage prior to implantation. When NeoCart is implanted, a bioadhesive is used to anchor NeoCart in the cartilage injury and seal the implant to the surrounding native cartilage interface. The use of our proprietary bioadhesive eliminates the need for complicated suturing, results in a rapid, controllable set-time, and enables the cartilage implant to integrate with the surrounding native cartilage. We believe that our completed Phase 1 and Phase 2 clinical trials provide preliminary evidence of the safety of the NeoCart implant and improvement in pain and function in patients treated with NeoCart.

We are currently enrolling a Phase 3 clinical trial for NeoCart in the United States to provide evidence of the safety and effectiveness of NeoCart, studying cartilage defects in the knees of 245 patients under a Special Protocol Assessment (SPA) with the United States Food and Drug Administration (FDA). Pursuant to the SPA, we formally and prospectively reached agreement with the FDA on key elements of the Phase 3 clinical trial protocol, including design, endpoints and statistical analyses of the resulting study data. The SPA is binding on the FDA review division with limited exceptions. If the clinical trial is successful, the data may be used to support efficacy claims for NeoCart approval and demonstrate clinical superiority over the current standard of

care, microfracture. Microfracture consists of the creation of tiny holes or “fractures” in the bone underneath the injured cartilage leading to formation of a blood clot in the affected area. The blood and bone marrow that form the clot contain stem cells, which are thought to grow into cartilage-building cells, as well as growth factors to support cell function and development of replacement cartilage matrix.

As of December 31, 2016, we had enrolled 196 patients into the Phase 3 clinical trial. We expect to complete enrollment of our NeoCart Phase 3 clinical trial by the end of the first half of 2017, but we may encounter difficulties enrolling patients in our Phase 3 clinical trial, which could delay or otherwise adversely affect our clinical development activities for NeoCart. As of December 31, 2016, we had 34 sites (out of a maximum of 40) eligible including two sites in Canada to enroll patients.

Musculoskeletal-related conditions, including cartilage damage, are one of the most prevalent health problems in the United States. Based on recent publications, we estimate that more than 1,200,000 knee arthroscopies are performed each year in the United States and we believe cartilage damage is likely to be identified and treated in over 60% of those knee arthroscopies. Furthermore, cartilage damage is a leading cause of osteoarthritis, a chronic condition in which cartilage breaks down, and the condition most responsible for the estimated 750,000 knee replacements performed in the United States annually. We believe the current alternatives available to treat cartilage damage in the knee, including microfracture, the most frequently used procedure for severe cartilage damage, inadequately address this condition.

We believe NeoCart would represent a superior solution to treat cartilage damage in the knee because it has the potential to solve for the limitations of the current treatment alternatives. In addition, NeoCart has the potential to provide accelerated patient recovery, improved efficacy, long-term patient benefits such as improved durability, and predictable patient outcomes through a technically straightforward surgical procedure. If we are able to successfully complete our Phase 3 clinical trial, we believe these advantages may assist in securing approval to sell NeoCart in the United States and may enable us to become a market leader in cartilage repair and regeneration.

To date, we have completed two FDA-regulated human clinical trials in the United States. Specifically, we conducted a Phase 1 safety study of eight patients and a Phase 2 randomized controlled exploratory study of 30 patients. The objective of the Phase 1 clinical trial was to demonstrate the safety of NeoCart for use when implanted into cartilage defects in the knee. The objectives of the Phase 2 clinical trial were to:

- continue the safety evaluation of NeoCart;
- gather additional efficacy data compared to microfracture;
- identify validated endpoints that are clinically meaningful to patients and physicians;
- identify appropriate patient populations to receive NeoCart; and
- obtain additional data to be used in the design of future clinical studies.

Data from these trials has been presented at leading scientific forums and published in peer-reviewed journals. For example, two-year data from the Phase 1 clinical trial was published in *The American Journal of Sports Medicine* in 2009 and two-year data from the Phase 2 clinical trial was published in *The Journal of Bone and Joint Surgery* in 2012.

In January 2017, five-year clinical and magnetic resonance imaging (MRI) data from the combined Phase 1 and 2 NeoCart clinical trials was published in the *American Journal of Sports Medicine*. The 2017 publication, included data from a total of 29 patients with symptomatic full thickness cartilage lesions of the distal femoral condyle that were treated with NeoCart in the Phase 1 and 2 clinical trials. Safety and efficacy were evaluated prospectively by MRI and patient reported outcomes (PROs) through a 60-month follow-up period, with 21 of 29 patients evaluable at the final time point. MRI analysis demonstrated NeoCart repair tissue to be durable and evolve over time. Changes in imaging measures over time corresponded with improvement in clinical measures,

with maximum benefits experienced at 24-months. The Phase 1 and 2 NeoCart PROs when compared to baseline also demonstrated statistically significant improvements on virtually all of the pain and functional endpoints, as early as 3 to 6 months, with sustained outcomes through five years. The results from these two prior studies indicate that NeoCart is a safe and effective treatment for articular cartilage lesions through five years.

Our objective is to publish additional data supporting the commercial use of NeoCart, if approved, and we anticipate that additional long-term data from the Phase 2 trial will be published in 2017. In the Phase 2 clinical trial, NeoCart demonstrated a clinically meaningful and statistically significant improvement in clinical efficacy based on pain and function measures as compared to microfracture one year after treatment. We believe these elements, specifically the one-year superiority primary endpoint based on a dual threshold responder analysis of both pain and function for each individual patient are unique to the NeoCart Phase 3 clinical trial. We also believe our Phase 3 clinical trial will confirm the positive Phase 1 and Phase 2 clinical data generated by NeoCart.

In anticipation of potential approval of NeoCart, we have continued the process of scaling our internal current Good Manufacturing Practices (cGMP) manufacturing capabilities and transitioning the manufacture of the critical components (raw materials) of NeoCart, including collagen, the proprietary scaffold and surgical adhesive in-house to our facilities located in the greater Boston area. The transition commenced in March 2014 with the communication of our plans to the FDA for the internal manufacture of NeoCart and the critical components of NeoCart, in the event NeoCart is approved. In December 2014, we received preliminary feedback and general acceptance of our raw material transition strategy and future commercial readiness upgrades from the FDA. In 2016, we reached agreement with the FDA on the data package for internally produced collagen, and in the second quarter of 2016 we incorporated this collagen into the ongoing, NeoCart Phase 3 clinical trial.

We also reached agreement with the FDA on the qualification and comparability plan for the NeoCart collagen scaffold in the third quarter of 2016, and we expect to complete the scaffold transition in 2017. Once the scaffold comparability work is complete we will work towards qualifying the components of the proprietary adhesive, which we also believe will be completed in 2017. Following completion of the transition, and as part of our BLA application for NeoCart, we will be required to obtain final FDA approval of the comparability of the critical NeoCart raw materials manufactured in-house. If we fail to obtain, or if we experience a delay in obtaining such approval, our business, operating results and prospects will be adversely affected.

We believe our regenerative medicine platform may provide us with the ability to develop a strong pipeline and that the positive clinical data we have seen in treating cartilage damage of the knee with NeoCart will be applicable to other joints such as the ankle, hip and shoulder. We also believe our regenerative medicine platform has the ability to translate the fundamental science relating to tissue engineering to allow us to develop additional product candidates to treat other soft tissue damage throughout the body such as tendon, ligament and meniscus tears and complex joint degeneration. Although not utilized in connection with our current NeoCart development, our portfolio of proprietary fibroblast growth factors may be explored for their use in optimizing manufacturing yields and we believe they could also have various therapeutic applications including wound healing and fracture healing. We plan to continue to invest in our intellectual property portfolio in order to expand and protect the components of our regenerative medicine platform and future product candidates.

Regenerative Medicine

Regenerative medicine is a rapidly developing, interdisciplinary field that is transforming healthcare by translating fundamental science into a variety of products and solutions aimed at repairing, regenerating or replacing function loss caused by injury, disease or aging. Regenerative medicine technologies encompass a variety of therapeutic approaches, including tissue engineering, cell-based therapies, gene therapy, small molecules and biologics, stem cells and biobanking. Any combination of these technologies may be used to harness or stimulate the body’s innate healing ability in order to treat a wide range of ailments, including musculoskeletal-related conditions, cardio- and peripheral vascular diseases, neurological disorders, stroke, non-healing wounds and ocular diseases.

Musculoskeletal conditions, comprised of injuries to or diseases of bones, cartilage, joints, ligaments, muscles, nerves, skin or tendons, are the most common health problem in the United States and are a leading cause of disability and healthcare expenditures according to *The Burden of Musculoskeletal Diseases in the United States*, a 2011 publication of a coalition of professional organizations including the American Academy of Orthopaedic Surgeons.

Limitations of Current Alternatives for Treating Cartilage Damage

We estimate, based on internal research, that over 500,000 knee cartilage procedures are performed annually in the United States, primarily in the form of debridement, microfracture, conventional autologous chondrocyte implantation (ACI) and osteochondral grafting. Debridement and microfracture procedures are the most frequently performed surgical procedures for the treatment of cartilage damage, accounting for an estimated 90% of all such procedures according to materials from a 2009 meeting of the Cellular Tissue and Gene Therapies Advisory Committee of the FDA. Debridement is an arthroscopic procedure that involves removal of injured or loose tissue debris by shaving, cutting or scraping it. Debridement does not attempt to repair cartilage damage. The surgeon's only goal when performing debridement is to improve a patient's symptoms of pain or loss of function.

Microfracture is considered the current standard of care for chondral defects due to its ability to improve symptoms in specific types of patients, its simplicity, its safety profile and the lack of other viable alternatives. The procedure consists of perforations, or microfractures, made to the bone plate at the location of cartilage damage in order to allow stem cells from the bone marrow to access the injured area. Microfracture surgery, a procedure pioneered in the 1980s, was developed to exploit the ability of stem cells to differentiate into mature cells and tissue types. If bone marrow stem cells are able to access the injured area and stay in place by forming a blood clot, then they may differentiate into cartilage cells, or chondrocytes, that would potentially go on to form cartilage. However, microfracture has been unsuccessful in reliably solving the underlying problem of cartilage damage because the repair tissue formed by the procedure, which has often been found to be a mix of tissue types, is incapable of withstanding the normal shock and shear forces that joint cartilage sustains and may not provide the appropriate level of lubrication to the joint.

In addition to its inability to solve the underlying problem—damage to the articular cartilage—microfracture is associated with numerous other drawbacks and limitations, including the following:

- ***Modest and Variable Efficacy:*** The results of microfracture vary based on patient-specific characteristics and individual healing responses. Studies have shown the benefits of microfracture are negatively influenced by advanced age, higher body weight or body mass index, larger chondral defect size and limited amount of repair tissue formed.
- ***Limited Long-Term Patient Benefits:*** Positive clinical response to microfracture has been shown to wane over time. A systematic review summarizing multiple articles on microfracture and published in the *American Journal of Sports Medicine* in 2009 revealed that up to 80% of microfracture patients report deterioration in their postoperative functional improvement after two years. Based on our interpretation of a 2013 article in *Cartilage* and the 2009 systematic review in the *American Journal of Sports Medicine*, we believe over 30% of microfracture patients require subsequent additional cartilage procedures after two years and up to 50% of all microfracture patients eventually require unplanned knee procedures due to persistent or recurrent symptoms.
- ***Extended Patient Recovery:*** Microfracture patients are typically not allowed to resume any vigorous activities for six months after surgery. During this time, patients must avoid weight-bearing activities for the first six weeks and use continuous passive motion machines for several hours per day. Prolonged physical therapy is often recommended. Such requirements and restrictions are believed necessary to optimize the anatomic and clinical results of microfracture, but come at the cost of muscle weakening, quality of life and delayed resumption of activities.

ACI and osteochondral grafting are procedures generally reserved either for patients who have failed prior cartilage procedures or those with very large cartilage defects. While studies indicate beneficial outcomes for patients receiving these treatments, both have drawbacks and limitations similar to those affecting debridement and microfracture, and also are associated with the following:

- ***Technically Demanding Surgeries:*** ACI is a slurry of autologous cartilage cells formed from a biopsy of a patient's cartilage and grown over six to eight weeks. A patch or cover is sometimes sutured into the surrounding healthy cartilage to hold the slurry in place or cells are delivered on a scaffold and affixed with an adhesive. Osteochondral grafting, whether using the patient's own cells or using another person's tissue, consists of a circular plug of bone and cartilage press-fit into the defect and can be challenging to perform because of the difficulty of achieving an exact match, fit and placement of the graft.
- ***Negative Safety Profile:*** ACI techniques are associated with graft failure, delamination (loss of cartilage layering), tissue overgrowth and knee stiffness. According to a 2006 report in the *Journal of Bone and Joint Surgery*, 48% of ACI patients underwent reoperation as a result of problems directly related to the graft. Osteochondral grafting, if performed with the patient's own cells, is associated with limitations in treatable defect sizes because of associated donor site morbidity.

Our Regenerative Medicine Platform and Initial Product Candidate

Our Regenerative Medicine Platform

Our regenerative medicine platform is comprised of innovative bioengineering, advanced proprietary materials sciences as well as molecular and cellular biology technologies that can be utilized individually or in a variety of combinations to treat musculoskeletal-related conditions:

- ***Cell Processing:*** As part of our process of implant production, our cell processing technologies involve the handling of a biopsy specimen in our own cGMP facilities, cell extraction from the biopsy and the isolation and expansion of cells in our segregated cell culture facility. These steps effectively return such cells to their juvenile phenotype where they may once again grow into mature cartilage cells. Our proprietary process is currently optimized for, but not limited to, cartilage cell culturing.
- ***Scaffolds:*** Scaffolds are structures capable of supporting three-dimensional tissue formation and providing an environment for the cells that are needed to form the tissue. Our proprietary, three-dimensional scaffold structures, including our honeycomb collagen scaffolds, are designed to produce a cartilage-like implant. The scaffold for NeoCart is shaped like a disk, with diameter of 34 mm and thickness of approximately 1.5 mm. The term "honeycomb" describes the shape of the pores inside of the scaffold as they are shaped like a honeycomb. The honeycomb structure is important because it allows cartilage cells to line up vertically throughout the scaffold so that they organize as they normally would in native cartilage. Competing scaffolds only accommodate cells on their surface or in layers. Our proprietary three-dimensional scaffolds can support and deliver a variety of cell types and are biocompatible, biodegradable and non-toxic.
- ***Tissue Engineering:*** Tissue engineering refers to applications that repair or replace portions of or whole tissues such as cartilage, bone, blood vessels and skin. We use a combination of cells, engineering and materials methods to produce our tissue implant for the purpose of repairing cartilage tissue. Our proprietary TEPs incubate our cell- and scaffold-based implants under conditions designed to mimic the conditions found in the knee, including pressure changes and low oxygen levels. We believe our proprietary TEP technology is unique to the tissue repair market and is one of the reasons patients receiving a NeoCart implant in our Phase 1 and Phase 2 clinical trials recovered more quickly and realized positive long-term outcomes as compared to patients receiving microfracture surgery.
- ***Bioadhesive:*** Our proprietary bioadhesive, CT3, secures the NeoCart implant in the defect and eliminates the need for complicated suturing that may be required during certain other cartilage repair

treatments. CT3 is biodegradable, non-toxic and comprised of three components: methylated collagen, activated polyethylene glycol (PEG) and a simple salt buffering solution that acts as a curing component. The curing component enables the physician to control the adhesive set-time which, we believe both simplifies and expedites the procedure relative to other autologous cartilage repair treatments. We believe CT3 also contributes to the quick recovery and the positive long-term outcomes seen in our Phase 1 and Phase 2 clinical trials.

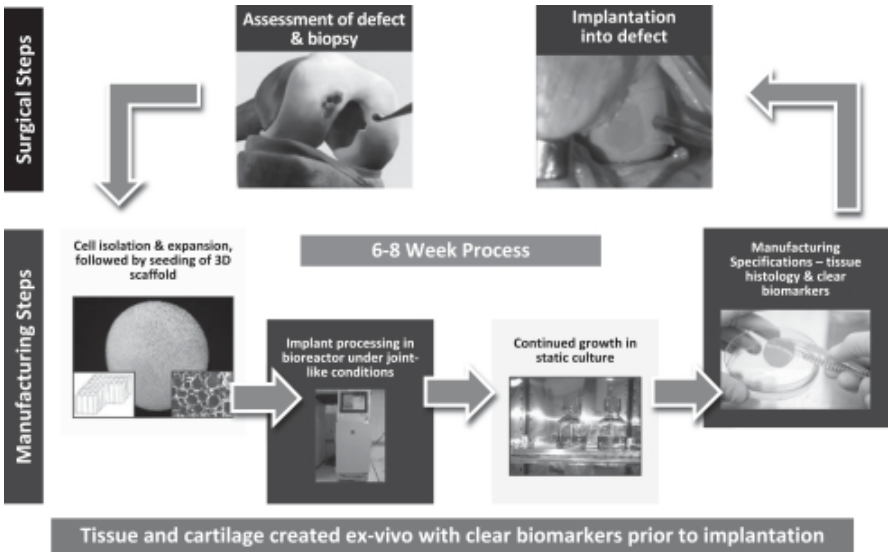
NeoCart: Our Initial Product Candidate

NeoCart, our Phase 3 product candidate, utilizes many aspects of our regenerative medicine platform to repair knee cartilage damage. We believe NeoCart has the potential to provide several benefits not provided by current treatment alternatives for knee cartilage damage, including:

- ***Improved Efficacy:*** In our Phase 2 clinical trial of 30 patients, NeoCart showed better clinical outcomes when compared to baseline and/or microfracture on multiple measures of pain and function throughout the duration of the study. In addition, patients treated with NeoCart experienced statistically significant and clinically meaningful improvements in the Knee Injury and Osteoarthritis Outcome Score (KOOS) pain and function subscales when compared to baseline as early as three months and continuing through five years after surgery, with similar results for the mean International Knee Documentation Committee Subjective (IKDC Subjective) scores. The difference in improvement between patients treated with NeoCart and those receiving microfracture started as early as three months in certain subscales and lasted up to five years. We believe efficacy seen in our clinical trials to date is a result of NeoCart's ability to function like cartilage upon implantation and integrate with the surrounding native tissue, features that distinguish it from current treatment alternatives. Based on biomarker release testing we conduct in our laboratories, there is evidence that NeoCart is comprised of maturing hyaline cartilage prior to implantation into a patient.
- ***Accelerated Patient Recovery:*** Our CT3 bioadhesive anchors NeoCart in the defect bed and seals it to the surrounding native cartilage. The cartilage-like NeoCart implant coupled with the secure CT3 fixation may allow for earlier weight-bearing and accelerated recovery of function than is typical with alternative therapies, which would be distinctly advantageous for any cartilage repair solution. In our Phase 3 clinical trial, patients may be allowed to begin weight-bearing activities as soon as two weeks following implantation versus six weeks for the current standard of care, microfracture.
- ***Long-Term Patient Benefits:*** In contrast to microfracture's well-documented deterioration of results after two years, NeoCart's positive outcomes have been sustained for up to five years in our Phase 1 and 2 clinical trials. We believe that all of the biologic and mechanical attributes of NeoCart provide the potential for a durable clinical response and give it the potential to prevent the evolution of osteoarthritis and subsequent need for knee replacement surgery.
- ***Technically Straightforward Surgery:*** The cartilage-like NeoCart implant has certain biomechanical competence and handling characteristics that allow the surgeon to easily trim the implant to the size of the defect. Furthermore, the use of our CT3 bioadhesive eliminates the need for complicated suturing associated with some ACI techniques. Unlike osteochondral grafting procedures, the NeoCart implant is tailored to the shape of the defect so that all normal host tissue is left in place.
- ***Positive Safety Profile:*** To date, NeoCart has shown no evidence of tissue overgrowth or knee stiffness often associated with ACI techniques. Reoperation rates to address problems directly related to the cartilage procedure or other persistent general knee symptoms, associated with all cartilage techniques and particularly high with ACI techniques, have been very low in NeoCart patients followed for five years in our Phase 1 and Phase 2 clinical trials.
- ***Favorable Reimbursement Profile:*** We are developing NeoCart to be used as a first-line therapy for the treatment of cartilage damage in the knee. We believe that the data we have generated to date, when

combined with the data from the ongoing Phase 3 clinical trial, may enable us to secure favorable reimbursement without the prior-authorization hurdles associated with the some of the currently available ACI therapies.

THE NEOCART PROCESS



Our Business Strategy

Our goal is to leverage our regenerative medicine platform to develop and commercialize innovative, next generation products to treat patients suffering from musculoskeletal-related conditions. The overarching strategies that support these goals are as follows:

- ***Complete the Phase 3 Clinical Trial and Apply for Regulatory Approval of NeoCart in the United States.*** We are currently enrolling our Phase 3 clinical trial. As of December 31, 2016, we had enrolled 196 patients and had 34 sites participating in the clinical trial. In 2016, we enrolled 82 patients as compared to 59 patients in 2015, representing an increase of approximately 40%. We believe this increase was largely due to a change in our approach to managing and recruiting patients into the clinical trial. We expect to complete enrollment in the Phase 3 clinical trial by the end of the second quarter of 2017 with 12-month data available in the middle of 2018. Assuming positive results of the NeoCart Phase 3 clinical trial, we plan to submit a Biologics License Application (BLA) to the FDA in the second half of 2018. Upon receiving approval from the FDA, if at all, which we anticipate would be in 2019 if a BLA is submitted in the second half of 2018, we then intend to launch and commercially market NeoCart in the United States for the treatment of cartilage defects in the knee.
- ***Continue to Develop Our Manufacturing Capabilities.*** We own and operate our own cGMP manufacturing operations for NeoCart and are in the process of transferring the production of the critical raw materials and components used in the NeoCart production process to our manufacturing facility in Lexington, Massachusetts. Our goal is to gain full control over quality, process, supply and costs. In 2016, we incorporated internally produced collagen into the ongoing, NeoCart Phase 3 clinical trial and reached agreement with the FDA on the qualification and comparability plan for the NeoCart collagen scaffold. We expect to complete the scaffold transition and comparability work and to begin and complete the qualification of the components of the proprietary adhesive in 2017. This transition to

our own manufacturing facilities will also enable us to expand production capacity for clinical and commercial supply of NeoCart in the future in the event we receive FDA approval, subject to comparability verification and confirmation by the FDA.

- ***Maximize Commercial Opportunity of NeoCart.*** We expect to invest strategically in a U.S. commercial infrastructure to support the successful launch, commercialization and post-marketing support for NeoCart, in the event NeoCart should receive FDA approval. As part of this investment, we intend to build a highly experienced medical affairs, sales and marketing organization to target orthopedic surgeons in the United States as the primary point of contact. In preparation for a potential launch of NeoCart, if ever, we are developing a reimbursement dossier to facilitate the introduction of NeoCart into the marketplace and are collecting Health Economics Outcomes Research data per a January 2015 protocol amendment to the ongoing NeoCart Phase 3 clinical trial. The additional data include key economic data and outcomes associated with quality of life, productivity and return to work status, as well as healthcare resource utilization related to direct and indirect costs. We believe the recovery advantages of NeoCart over other treatments may be substantial, and expect these data to be critical to the reimbursement and adoption of NeoCart, if approved. Furthermore, we intend to leverage these data and our manufacturing expertise to develop potential commercial and product collaborations in markets outside of the United States, such as Japan and Asia, in order to maximize the commercialization of NeoCart in those markets.
- ***Leverage Our Regenerative Medicine Platform and Exclusive Channel Collaboration Agreement with Intrexon to Expand Our Pipeline.*** We believe the strength of our regenerative medicine platform provides us with a significant opportunity to enhance and expand our product pipeline. In addition, we believe we can leverage our technology and reduce our manufacturing costs by using Intrexon's synthetic biology technology platform to develop and commercialize genetically modified chondrocyte cell therapeutics for the treatment or repair of damaged articular hyaline cartilage in humans. Initially we are focused on using Intrexon's technology to develop induced pluripotent stem cell derived (IPSC) source materials in our NeoCart manufacturing process. In 2016, we generated positive proof-of-concept data for IPSC derived NeoCart implants and are working with Intrexon to define the most appropriate development and regulatory plans to move this program forward. We also believe there is a significant unmet market need and commercial opportunity to treat cartilage defects in other joints such as ankles, shoulders and hips and intend to explore these areas both alone and in conjunction with Intrexon. Examples of such initiatives may include one-step, off-the–shelf and/or next-generation NeoCart products as well as products designed to treat additional soft tissue and musculoskeletal-related disorders.
- ***Continue to Invest in Our Intellectual Property and Selectively Evaluate Business Development Opportunities.*** Our intellectual property estate includes more than 55 licensed or owned patents worldwide as well as trade secrets and know-how around the manufacturing of cell therapies. We intend to continue to expand our intellectual property portfolio to further protect both NeoCart and our future product candidates by filing patent applications in the United States, the European Economic Area (EEA, which is comprised of the 28 Member States of the European Union, Iceland, Liechtenstein and Norway) and other jurisdictions. In addition, we believe there may be opportunities to generate additional value from our intellectual property portfolio and intend to explore and evaluate various business development opportunities, both domestically and internationally, including collaborations around rights to NeoCart outside the United States. Furthermore, we believe there are opportunities to bring in complementary technologies and or product candidates that will leverage the commercial infrastructure we intend to build for the potential launch of NeoCart, if approved, and we intend to pursue such opportunities in the future.

Our Phase 3 Product Candidate: NeoCart

NeoCart data for the Phase 1 and 2 clinical trials have been published in leading medical journals including the *Journal of Bone and Joint Surgery* and the *American Journal of Sports Medicine*. The results from these two

prior studies indicate that NeoCart may be a safe and effective treatment for articular cartilage lesions through five years of follow-up. We believe the *Journal of Bone and Joint Surgery*, accepted the initial Phase 2 data because of the high degree of rigor and quality of the design and analysis of the data. Please see the sections below entitled “Phase 2 Clinical Trial” and “Phase 1 Clinical Trial” for a discussion of the data from our Phase 1 and Phase 2 clinical trials.

In the first quarter of 2017, five-year clinical and MRI data from 29 patients with symptomatic full thickness cartilage lesions of the distal femoral condyle that were treated with NeoCart in the combined Phase 1 and 2 clinical trials were published in the *American Journal of Sports Medicine*. The publication contained an analysis and evaluation of safety and efficacy based on prospective MRI analyses and PROs through a 60-month follow-up period with 21 of 29 patients evaluable at the final time point. NeoCart patients in the publication were followed over a median of 60 months.

Qualitative MRI metrics were quantified according to modified magnetic resonance observation of cartilage repair tissue (MOCART) criteria, with an additional evaluation of repair tissue signal intensity. MOCART analyses indicated significant improvement ($p<0.001$) in cartilage quality from three 3 to 24 months, with stabilization and maturation from 24 to 60 months. P-values are an indication of statistical significance reflecting the probability of an observation occurring due to chance alone. A p-value<0.001 means that the probability of the event measured occurring by chance is less than 1 in 1,000. In addition, MRI analysis demonstrated NeoCart repair tissue to be durable and evolve over time. Changes in imaging measures over time corresponded with improvement in clinical measures, with maximum benefits experienced at 24-months. The Phase 1 and 2 NeoCart PROs when compared to baseline also demonstrated statistically significant improvements on virtually all of the pain and functional endpoints, as early as 3 to 6 months, with sustained outcomes through 5 years.

Specifically, there were significant improvement in PROs from baseline measurements (mean ± standard deviation at baseline to mean ± standard deviation at follow-up points) that are summarized in the table below.

TABLE 2
Change in Patient-Reported Outcomes From Baseline to Each Time Point[a]

	Score						
Parameter	3 mo	6 mo	12 mo	24 mo	36 mo	48 mo	60 mo
IKDC subjective (n = 29)	6.7 ± 19.0	15.7 ± 19.0[b]	27.3 ± 18.4[b]	31.8 ± 19.5[b]	31.4 ± 21.9[b]	28.5 ± 27.0[b]	27.4 ± 20.2[b]
VAS mean (n = 29)	–13.5 ± 23.9[c]	–20.8 ± 21.2[b]	–22.5 ± 21.2[b]	–27.9 ± 18.8[b]	–24.2 ± 21.8[b]	–26.2 ± 21.2[b]	–19.0 ± 27.4[c]
VAS highest (n = 21)	–23.2 ± 31.2[c]	–30.2 ± 32.7[b]	–39.8 ± 24.6[b]	–46.6 ± 24.3[b]	–36.8 ± 29.8[b]	–51.5 ± 28.5[b]	–36.4 ± 32.2[b]
KOOS-Pain (n = 21)	11.6 ± 11.1[b]	19.6 ± 14.1[b]	21.4 ± 10.4[b]	22.4 ± 9.4[b]	22.0 ± 10.0[b]	23.3 ± 10.8[b]	21.0 ± 11.2[b]
KOOS-ADL (n = 21)	10.6 ± 15.6[c]	15.1 ± 13.6[b]	16.7 ± 10.7[b]	18.9 ± 11.5[b]	15.9 ± 11.1[b]	16.7 ± 11.4[b]	16.0 ± 12.4[b]
KOOS-QoL (n = 21)	15.6 ± 18.0[b]	22.9 ± 16.8[b]	30.7 ± 17.2[b]	43.4 ± 23.3[b]	42.2 ± 26.8[b]	46.7 ± 32.3[b]	45.4 ± 23.9[b]
KOOS-Symptoms (n = 21)	8.4 ± 15.9[d]	17.0 ± 10.8[b]	18.2 ± 13.2[b]	20.5 ± 15.3[b]	20.1 ± 19.9[c]	21.4 ± 20.8[c]	22.1 ± 15.1[b]
KOOS-Sports (n = 21)	3.8 ± 29.8	16.4 ± 33.9[d]	27.7 ± 22.7[b]	35.8 ± 22.5[b]	35.6 ± 25.4[b]	36.3 ± 24.1[b]	31.7 ± 28.5[b]
SF-36 physical (n = 21)	5.0 ± 9.0[d]	9.4 ± 8.2[b]	9.3 ± 6.3[b]	12.8 ± 8.1[b]	11.8 ± 9.3[b]	13.6 ± 7.1[b]	11.3 ± 7.0[b]
SF-36 mental (n = 21)	–0.2 ± 8.6	1.2 ± 8.9	2.6 ± 8.6	1.0 ± 9.4	1.8 ± 10.6	0.0 ± 8.2	2.2 ± 10.0
Active ROM (n = 29), deg	1.6 ± 8.6	3.6 ± 8.8[d]	5.0 ± 8.6[c]	5.7 ± 9.5[c]	8.2 ± 9.0[b]	8.6 ± 8.0[b]	10.7 ± 9.6[b]
Loss to follow-up,[e] n	2	0	0	2-3	4-6	6-8	7

[a]Data are reported as mean ± SD unless otherwise indicated. ADL, Activities of Daily Living; IKDC, International Knee Documentation Committee; KOOS, Knee injury and Osteoarthritis Outcome Score; QoL, Quality of Life; ROM, range of motion; SF-36, Short Form–36; VAS, visual analog scale.
[b]Statistically significant difference from baseline: $P < .001$.
[c]Statistically significant difference from baseline: $P < .01$.
[d]Statistically significant difference from baseline: $P < .05$.
[e]Loss to follow-up values (n) are variable because of patients omitting 1 patient-reported outcome at the visit indicated.

The results from these two prior studies, as further set forth in the 2017 publication in the *American Journal of Sports Medicine* indicate that NeoCart may be a safe and effective treatment for articular cartilage lesions through five years. Furthermore, the demonstrated rapid maturation of cartilage as evidenced by the MRI data from the Phase 1 and Phase 2 clinical trials is consistent with biomechanical data generated and presented by Histogenics and Cornell University that showed that *in vitro* cartilage constructs, or tissue implants, produced

using a process that is designed to mimic that of NeoCart exhibited mechanical properties prior to implantation that were similar to that of native cartilage. The biomechanical data were initially presented at Orthopedic Research Society 2016 annual meeting and are published in *the Journal of Orthopaedic Research*. Taken together, these results suggest that the maturation of tissue-engineered cartilage implants, such as NeoCart, leads to improved mechanical properties prior to implantation and may result in a more rapid recovery and return to function for patients suffering from cartilage defects.

We consider the data observed thus far to be a direct result of NeoCart's distinct attributes that combine to form a sophisticated and unique biologic implant with evidence of cartilage growth prior to implantation and the ability to function like normal cartilage upon implantation. Further, we believe the data reflects that, after implantation, NeoCart continues to mature and integrate with the native cartilage as it is exposed to the natural environment of the joint. We believe these attributes and the clinical data we have accumulated to date differentiate NeoCart from other treatment alternatives, including microfracture.

Phase 3 Clinical Trial

We are pursuing FDA approval via a BLA pathway with a clinical trial designed to show superiority against the current standard of care, microfracture. Our NeoCart Phase 3 clinical trial is being performed under an SPA with the FDA and was initiated as a confirmatory study based on the promising safety and efficacy findings from our Phase 2 clinical trial. The Phase 3 clinical trial design, based on our Phase 2 clinical trial, is a prospective, controlled, multi-center trial of 245 adults between the ages of 18 and 59 years who have symptomatic focal full-thickness chondral knee defects randomized between NeoCart and microfracture on a two-to-one basis. Randomization is done at arthroscopy, at which time final patient eligibility is determined.

As agreed to with the FDA under our SPA, the primary endpoint for approval is superiority at one year in the proportion of responders in the NeoCart patient group compared to the proportion of responders in the microfracture patient group in a dual-threshold responder analysis. We believe that both the one year primary endpoint and the dual threshold responder analysis are unique to the NeoCart Phase 3 clinical trial. Specifically, the one year endpoint may be a result of our ability to make cartilage tissue *ex vivo* which has the potential to result in a more rapid recovery. We believe the dual threshold responder analysis represents a high hurdle endpoint that requires patients to have clinically meaningful responses on both pain and function scales—results that may be difficult for other procedures to achieve. The dual-threshold responder analysis utilizes the KOOS pain subscale and IKDC Subjective assessments. Both the KOOS pain and the IKDC Subjective assessments are validated, patient-centered and self-administered outcome instruments intended to assess patient-relevant outcomes. The KOOS separately assesses and scores five dimensions of outcomes from the patient's perspective: pain, symptoms, activities of daily living, sport and recreation function and knee-related quality of life. Similarly, the IKDC Subjective assesses and scores three dimensions of outcomes from the patient's perspective: symptoms, function during activities of daily living and sports.

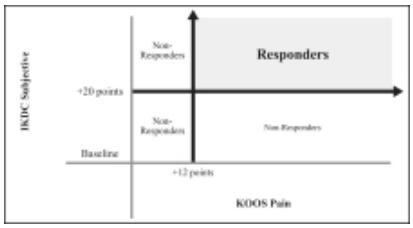
The scores are tabulated and transformed to a 100-point scale, where 100 represents the best outcome for either pain or function and zero represents the worst outcome. A one-year superiority endpoint was deemed appropriate for our Phase 3 clinical trial under our SPA based on the magnitude of difference between the responder rates at one year for patients receiving NeoCart implants and patients receiving microfracture surgery in our Phase 2 clinical trial. We believe that, should our Phase 3 clinical trial show a comparable magnitude of difference in responder rates between NeoCart and microfracture, NeoCart's ability to function like cartilage upon implantation and integrate with the surrounding native tissue (attributes of NeoCart we believe are responsible for our Phase 2 clinical trial results) will be a principal reason for the one-year Phase 3 clinical trial outcome and the presumed resultant durability. However, there is no guarantee that our Phase 3 clinical trial results will demonstrate the same results as our Phase 2 or Phase 1 clinical trials and NeoCart may not be approved for sale in the United States by the FDA after the FDA reviews the results of the Phase 3 clinical trial.

Similar to our Phase 2 clinical trial, discussed below in "Phase 2 Clinical Trial," in the Phase 3 clinical trial, a patient is considered a responder if he or she achieves both of the following patient-reported outcomes:

- improvement of at least 12 points compared to the patient's baseline score in KOOS pain subscore assessment; and
- improvement of at least 20 points compared to the patient's baseline score on the IKDC Subjective assessment.

In the schematic below, the area in the upper right-hand quadrant of the graph, shaded in gray, is the zone reflecting those patients who achieved improvement of both at least 12 points on the KOOS pain scale and at least 20 points on the IKDC Subjective. The horizontal axis, or x-axis, is the KOOS pain scale and the vertical axis, or y-axis, is the IKDC Subjective.

SCHEMATIC REPRESENTATION OF RESPONDER RATE ANALYSIS



The following additional endpoints will be evaluated in secondary superiority testing at one year comparing the NeoCart patient group to the microfracture patient group:

- time to full weight-bearing;
- "treatment failure," defined as a greater than an 8-point deterioration in KOOS pain score at one year compared to baseline and/or a reoperation; and
- presence of mature collagen layering as assessed by magnetic resonance imaging cartilage mapping at one year.

Patients will be followed for a total of three years for safety and additional efficacy data.

Phase 3 Status

As of December 31, 2016, we had enrolled 196 patients into the Phase 3 clinical trial, an increase of approximately 72% over total enrollment at December 31, 2015. We expect to complete enrollment of our NeoCart Phase 3 clinical trial by the end of the second quarter of 2017, but we may encounter difficulties enrolling patients in our clinical trials, which could delay or otherwise adversely affect our clinical development activities. In November 2015, we filed an amendment to the NeoCart Phase 3 clinical trial protocol under the SPA to expand the eligible patient population. In December 2015, the FDA accepted the amendment which allows for, among other things, the inclusion of patients with trochlear lesions and the inclusion of patients up to age 59 into the trial. As of December 31, 2016, we had 34 sites eligible (out of a maximum of 40) to enroll patients.

In late 2009, pursuant to our SPA, we initiated our Phase 3 clinical trial and our first patient was randomized in June 2010. In September 2010, after nine patients had been randomized, active enrollment was postponed until the completion of a convertible debt financing in late 2011.

In November 2012, we voluntarily suspended manufacturing operations and paused enrollment of the NeoCart Phase 3 clinical trial upon discovery of discrepancies in the testing procedures used to assess one of the raw materials (bovine-derived type I collagen) utilized in the manufacture of NeoCart implants. All participating clinical trial sites, including Institutional Review Boards (IRB), and the FDA were notified of our decision. After an in-depth review of all available information, we concluded that the observed discrepancies did not impact product quality or patient safety, but we chose to continue our self-imposed pause to improve and upgrade certain of our existing manufacturing and quality control systems processes to meet or exceed cGMP standards. This transition was completed in December 2013. Prior to our November 2012 voluntary election to pause enrollment, 30 patients had been randomized into the NeoCart Phase 3 clinical trial. Twenty-one of these patients were randomized to receive a NeoCart implant and nine were randomized to undergo a microfracture procedure.

Phase 2 Clinical Trial

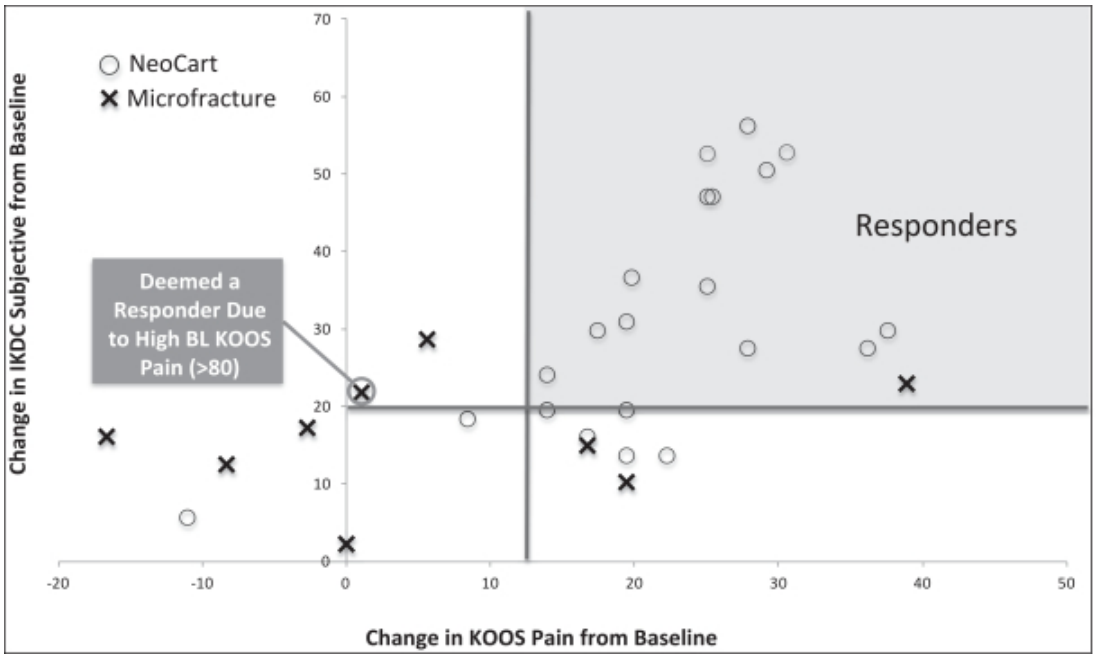
Our NeoCart Phase 2 clinical trial was initiated in 2007 to evaluate further the positive safety and early efficacy signals demonstrated in our Phase 1 clinical trial of NeoCart for articular cartilage damage in the knee. We also sought to identify clinically meaningful endpoints and appropriate patient populations to be studied in the design of future clinical studies. The trial was a five-year prospective, controlled, randomized, clinical study of 30 patients conducted at six U.S. centers and completed its enrollment in 2008. Twenty-one patients were randomized to receive a NeoCart implant and nine patients were randomized to undergo a microfracture procedure. The trial was completed in 2013 with final data collection and analysis in 2014 and 2015.

In the Phase 2 clinical trial, baseline (preoperative) pain and function assessments were obtained and included, among other measurement instruments, the KOOS pain and symptoms subscales, the IKDC Subjective assessment and a visual analog pain scale. At every measurement interval between three months and three years, the same pain and function assessments were measured. The data were analyzed using descriptive statistics (mean and standard deviation), paired t testing and analysis of covariance with significance levels (p-values) set at less than 0.05 (two-sided). According to the results of the analysis, those patients receiving a NeoCart implant achieved statistically significant improvement (all p-values <0.05) compared to their baseline assessments on the KOOS pain and symptoms subscales, the IKDC Subjective assessment and a visual analog pain scale, meaning that sufficient data exist to indicate the improvement on each measure is unlikely to have occurred by chance. Furthermore, when this improvement from baseline was compared to the improvement of microfracture from baseline, NeoCart's improvement was statistically significantly better (all p-values <0.05) than microfracture's improvement on a meaningful number of the measurements.

Additional comparison of the two groups was performed with the previously described dual-threshold responder analysis we are utilizing in our Phase 3 clinical trial. To be considered a responder in the Phase 2 clinical trial, a patient must have achieved a minimum improvement on the KOOS pain subscale and the IKDC Subjective assessment compared to his or her baseline scores. The minimum required improvement for pain was 12 points and the minimum required improvement for function was 20 points.

The selected thresholds have been validated in the literature as clinically meaningful to patients. In some cases, patients entered the Phase 2 clinical trial with pain scores at a level such that they could not have improved a great deal (for example, a baseline of 91 points on a scale of 100). In those cases, patients were considered responders if their function scores improved a minimum of 20 points even if their pain scores did not improve the required 12 points. Compared to the microfracture group, NeoCart-treated patients had superior responses to treatment as early as three months in certain subscales with such responses lasting up to five years.

RESPONDER RATE ANALYSIS AT YEAR 1



As shown in the graphic above, at Year 1, the number of NeoCart patients (represented by an "O") who achieved responder status was greater than the number of microfracture patients (represented by an "X") who achieved responder status. Many patients far exceeded the minimum dual thresholds required to be considered a responder.

As explained more fully above, some patients entered the Phase 2 clinical trial with minimal pain indicated by a high baseline KOOS pain score. A score of 100 on the KOOS pain scale indicates the patient is reporting no pain. In those few cases, only the change in IKDC Subjective score was used to determine if the patients responded to therapy. In those cases, patients were deemed responders if their function scores improved a minimum of 20 points even if their pain scores did not improve the required 12 points.

In November 2013, the five-year observation period for the Phase 2 clinical trial concluded. Initial preliminary results were presented at the May 2015 Annual Meeting of the International Cartilage Repair Society demonstrating continued positive results of NeoCart. A subsequent analysis and validation of the data was performed in the second half of 2015 in connection with the submission of the data to the FDA and for peer-reviewed publication. The data from the trial are now final, and are currently under review for a future peer-reviewed publication, which is expected in 2017. Based on the initial analysis and consistent with already published initial data, NeoCart generally demonstrated a lasting improvement over baseline through five years after implant. During the course of the trial, no serious adverse events (expected or unexpected) were considered to be product- or implant-related. We believe the data demonstrate the advantage of NeoCart relative to Microfracture through five years after surgery. Importantly, the difference in responders at the end of the first year (the primary endpoint on our current Phase 3 clinical trial) was statistically significant ($p < 0.05$). Two-year results of this trial were published in the *Journal of Bone and Joint Surgery* in 2012.

Phase 1 Clinical Trial

A Phase 1 clinical trial was conducted to demonstrate the safety of NeoCart for use when implanted into cartilage defects in the knee with the intention of repairing the articular cartilage defects. The two-year results of our Phase 1 clinical trial were published in the *American Journal of Sports Medicine* in 2009. Among the eight

patients studied, all of whom enrolled in 2005 and completed five years of observation, a highly favorable safety profile of NeoCart was documented. The trial was completed in 2010 and final data collection was completed in 2011. Specifically, few reported complications occurred and no serious adverse events (expected or unexpected) were deemed treatment-related. No cases of infection, implant rejection or immune reaction were documented. Additionally, joint stiffness and implant overgrowth did not occur in any patient. Efficacy signals in the form of significant improvement in pain and function, measured with patient-reported outcome surveys such as the visual analog pain scale and the IKDC Subjective score, compared to each patient's baseline scores were also noted.

Pipeline and NeoCart Indication Expansion

We intend to build a robust development pipeline by leveraging our regenerative medicine platform and intellectual property portfolio as well as expanding the applications of NeoCart into additional indications. Although our initial focus for NeoCart is for the treatment of knee cartilage damage, we plan to leverage our regenerative medicine platform to explore the treatment of chondral defects in other joints, such as the ankle, hip and shoulder. Furthermore, we believe our platform can be utilized to address more extensive cartilage damage associated with significant bone loss and generalized arthritis as well.

Our acellular scaffolds are capable of hosting cells of any type, which allows us the flexibility to tailor their use for other regenerative medicine opportunities beyond cartilage repair, including ligament, tendon and meniscus repair. In addition to the potential use of our growth factor variants to optimize our manufacturing process, our proprietary growth factor variants may be of use in therapeutic applications such as fracture healing, osteoporosis, generalized osteoarthritis, orphan diseases involving genetically-based bone growth disruption and wound healing.

In September 2014, we entered into our ECC with Intrexon that governs a "channel collaboration" arrangement. Pursuant to the ECC we are working with Intrexon to utilize their synthetic biology technology platform for the development and commercialization of allogeneic, genetically modified, chondrocyte cell therapeutics for the treatment or repair of damaged articular hyaline cartilage in humans. We believe an allogeneic therapy may offer advantages to both the patient and Histogenics including the elimination of the need for a biopsy and the ability to significantly streamline and thereby reduce the costs of manufacturing.

Together with Intrexon, we reached a number of important objectives in 2016. After evaluating a number of different cell sources we decided to focus our development efforts on the use of IPSC source materials to make a next-generation NeoCart. In 2016, we generated positive proof-of-concept data for IPSC derived NeoCart implants and are working with Intrexon to define the most appropriate development and regulatory plans to move this program forward.

Commercialization

If NeoCart is approved by the FDA, we plan to build our own commercial organization in the United States to support the launch and commercialization of NeoCart. The organization will be designed for scalability to support other potential future products as well. For NeoCart, we initially plan to launch with a small sales force and scale up to approximately 40 sales representatives and management after FDA approval. The NeoCart sales force will target the estimated 4,000 to 5,000 orthopedic surgeons in the United States who may use NeoCart, including a core group of physicians focused on the care of cartilage injuries. We expect this core commercial team to be comprised of experienced sales representatives with relevant industry experience in the areas of orthopedic surgery and biologics sales. We may also selectively evaluate commercialization strategies, including partnering, for NeoCart outside of the United States due to the cost and complexity of building an international infrastructure and, in some regions the challenging economic and reimbursement environments. For example, we believe that Asia, specifically Japan, may be an attractive market opportunity. The Japanese market for cartilage repair is estimated to represent more than 200,000 procedures annually and is growing due to favorable demographic trends and a greater general acceptance of regenerative medicine products relative to other parts of

the world. Furthermore, the Japanese Regenerative Medicine Law was passed in 2014 to potentially expedite the clinical development and commercialization pathways for innovative regenerative cell-based medicines that have demonstrated safety and probable efficacy. To date, two new products have received full and conditional approval since the law went into effect with favorable reimbursement profiles.

In 2016, we initiated discussions with the Japan Pharmaceuticals and Medical Devices Agency (PMDA) regarding the development of NeoCart for the Japanese market. To date we have held both informal and formal meetings to discuss the data from the NeoCart Phase 1 and Phase 2 clinical trials, the ongoing Phase 3 trial design and the proposed development program and the required regulatory submission package for potential conditional approval. In the first half of 2017, we intend to conduct formal meetings with the PMDA to define and agree upon the regulatory pathway and development requirements for the potential conditional approval of NeoCart in Japan. Once we have completed this process, we will seek to find a commercial and manufacturing partner for the Japan or Asia Pacific market.

Manufacturing

We operate our own cGMP manufacturing facility in Waltham, Massachusetts for the end-to-end production of NeoCart. We currently have adequate capacity in our Waltham, Massachusetts facility to meet NeoCart clinical demand and we believe we have adequate capacity to meet initial commercial demand if we are successful in receiving regulatory approval for NeoCart in the United States.

Our manufacturing strategy is to own and operate fully integrated cGMP manufacturing operations for the commercial production of NeoCart in the event NeoCart receives FDA approval. We have historically manufactured the NeoCart implants for our clinical trials and are in the process of transitioning the production of the NeoCart components, or critical raw materials, to our facility in Lexington, Massachusetts in order to gain full control over quality, process, supply and costs. We intend to demonstrate the comparability of NeoCart implants made with the new raw materials to the prior implants that we produced with the critical raw materials from third-parties and are in the process of conducting the work necessary to support comparability. Please see the sections below entitled “NeoCart Technology and Materials Transfer” for additional information. Please see “Risk Factors—Risks Related to Our Business and Commercialization of Our Product Candidates—Failure to obtain, or any delay in obtaining, FDA approval regarding the comparability of critical NeoCart raw materials following our technology transfer and manufacturing location transition may have an adverse effect on our business, operating results and prospects” for additional information on the risks associated with our intellectual property strategy and portfolio.

We have also entered into a supply agreement with Collagen Solutions (UK) Limited (Collagen Solutions) pursuant to which we may seek to establish them as a secondary source of additional collagen for use in our manufacture of NeoCart in the U.S. We may also seek to collaborate with Collagen Solutions for potential future European manufacturing capabilities for future clinical trials of NeoCart and commercialization, if approved.

NeoCart Manufacturing Process

Our manufacturing process for NeoCart is systematic and organized with specific steps that are tightly controlled. The first step includes receiving a biopsy from the patient’s own cartilage from which cartilage cells can be isolated and expanded in number using segregated cell culture technology at our cGMP manufacturing facility in Waltham, Massachusetts. Once we have achieved an adequate number of cartilage cells, these cartilage cells are placed into a sterile collagen solution provided to us in vials after sterile filtration by a third-party contract manufacturer, and then applied to the three-dimensional collagen scaffold. The scaffold, which is currently provided to us by a third-party supplier, provides an environment for the NeoCart implant to grow and develop into the form ultimately implanted. The development of the NeoCart implant occurs under controlled conditions in our TEP system which exposes the implant to pressure cycles designed to simulate the pressure cycles that cartilage is exposed to in the knee. After development in the TEP system, the implant is placed into a solution

that allows further maturation prior to implantation. Once the implant is mature and has met the appropriate manufacturing and quality control specifications, which include certain biomarkers of native, articular, hyaline cartilage, it is shipped by a third-party to the clinical site for implantation in the patient. This typically occurs within three to five days after the completion of the manufacturing process. The manufacturing cycle time, from receipt of biopsy to delivery of the implant, is approximately six to eight weeks. The range in cycle time is dependent upon the variability in the growth rates of the cells obtained from individual patients.

The quality control laboratory, located within our main Waltham, Massachusetts facility, handles cGMP release testing for the raw materials, CT3 components and adhesive, the collagen scaffold and final NeoCart implant. Further, our quality control group handles all in-process and finished product environmental monitoring related to the manufacturing process. Testing is performed pursuant to validated test methods using qualified equipment.

NeoCart Technology and Materials Transfer

Manufacturing of raw materials and components used in the NeoCart supply chain is undergoing a technology transfer from outsourced contract manufacturers, which we used for clinical manufacturing, to our manufacturing facility in Lexington, Massachusetts, which we will use for commercial manufacturing in the event NeoCart is approved by the FDA. This technology transfer extends to the base collagen, the collagen honeycomb scaffold and the three components of the CT3 bioadhesive—methylated collagen, curing solution and activated PEG. Sterile filtration and aseptic filling of our sterile collagen solution used in NeoCart production will continue to be performed by a third-party contract manufacturer until after commercialization. We do not anticipate any material changes to raw materials, components, formulations or properties, nor do we anticipate material changes to the NeoCart manufacturing process or finished product specifications as a result of the transfer.

Because we are transitioning production of critical raw material and components to our own manufacturing facility for future commercial production, we will be required to demonstrate to the FDA that the raw collagen material and the components manufactured in our facility are comparable to those that were used previously in clinical studies. In December 2014, we obtained FDA feedback and general agreement with our plans via a formal FDA-Sponsor Type C meeting, where we presented technology transfer and comparability plans that included our product test methods, and manufacturing process summaries. Based on internal review, guidance from FDA and a response from the FDA to our type C meeting received in January 2015, we believe our current strategy to generate and provide comparability data to the FDA for review should be sufficient.

In 2016, we reached agreement with the FDA on the data package for internally produced collagen, and in the second quarter of 2016 we incorporated internally produced collagen into the ongoing, NeoCart Phase 3 clinical trial. After the base collagen material, we focused on the remaining critical raw materials including the collagen scaffold and the adhesive, both of which have collagen as a component. We reached agreement with the FDA on the qualification and comparability plan for the NeoCart collagen scaffold in the third quarter of 2016 and expect to complete the scaffold transition in 2017. Once the scaffold transition is complete we will work towards qualifying the components of the proprietary adhesive, which we also believe will be completed in 2017. We believe we will be able to complete the transition without any additional clinical studies. However, as part of our BLA application for NeoCart, we will be required to obtain FDA approval of the comparability of the critical NeoCart raw materials manufactured in-house.

Intellectual Property

Patent and trade secret protection is critical to our business. Our success will depend in large part on our ability to continue to protect our cell processing technology, materials science and products for tissue repair through a variety of methods, including seeking, maintaining and defending patents and other intellectual property intended to cover our products and compositions, their methods of use and processes for their manufacture, our platform technologies, our trade secrets and any other inventions that are commercially important to the development of our business. We actively seek patent protection in the United States and select foreign countries.

Our intellectual property portfolio is currently composed of 15 issued patents and 8 patent applications in the United States that we own, and 27 issued patents and six patent applications in the United States that we license from academic institutions and business entities. We also have over 100 counterpart patent and patent applications owned or licensed in certain foreign jurisdictions. This portfolio of owned and in-licensed patents and patent applications covers aspects of: our implants, including NeoCart and our protein implants; our tissue engineering processor; our adhesives; our growth factors, methods of delivery of therapeutic agents and promoters for increased expression of protein; our method for treatment of ligament and tendon injuries; surgical tools for placing our implants; and our bone composites. The patents that cover the listed technologies have statutory expiration dates between 2020 and 2031.

We have entered into license agreements with various academic institutions and business entities to obtain the rights to use certain patents and patent applications for the development and commercialization of our technology and products. We also rely on know-how and continuing technological innovation to develop and maintain our proprietary position.

We license from Purpose Co., Ltd. (f/k/a Takagi Sangyo Co. Ltd. and f/k/a Takagi Industrial Co., Ltd.) (Purpose) an exclusive right to 39 issued patents and 10 pending patent applications worldwide relating to an exogenous tissue processor. Through this agreement, we have a sublicense to three issued U.S. patents and six issued foreign patents owned by Brigham and Women's Hospital, Inc. (BWH) and Purpose that relate to compositions and methods for preparing multi-layered tissue constructs that include a cellular support matrix seeded with living cells derived from a native tissue and tissue culture protocols to promote the in vitro growth of tissues and tissue constructs. We also have an exclusive license to two issued U.S. patents and one pending U.S. patent application for restoration of articular cartilage matrix from the Board of Trustees of The Leland Stanford Junior University. The patents that have issued or may yet issue that have been licensed to us under these agreements will have statutory expiration dates between 2021 and 2031.

We have an exclusive license to a portfolio consisting of four families of issued patents and pending patent applications owned by Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH. This exclusivity is for CT3 for use in combination with intellectual property for the repair of articular cartilage, ligament, meniscus or tendon damage. The patents relate to a method of introducing rapidly gelling biodegradable collagen-PEG hydrogel to the site of injury, methods of inducing meniscal regeneration by introducing a strong adhesive to a site of injury and methods for in situ repair in which the meniscal injury is filled with an adhesive hydrogel complex consisting of methylated PEG and in which the injury is filled with the adhesive hydrogel complex and a collagen matrix. Any patents within this portfolio that have issued or may yet issue will have statutory expiration dates between 2014 and 2019.

We have an exclusive license to a portfolio of three patent families relating to growth factors and high level expression of heterologous proteins owned by Yeda Research and Development Co., Ltd. Any patents within this portfolio that have issued or may yet issue will have statutory expiration dates between 2016 and 2023.

We continually assess and refine our intellectual property strategy in order to fortify our position in our target markets. We cannot ensure that patents will be granted with respect to any of our pending owned or in-licensed patent applications or with respect to any patent applications we may own or license in the future, nor can we be sure that any of our existing owned or in-licensed patents or any patents we may own or license in the future will be useful in protecting our technology. Please see "Risk Factors—Risks Related to Our Intellectual Property" for additional information on the risks associated with our intellectual property strategy and portfolio.

Material Technology License Agreements

Purpose Co., Ltd.

On May 10, 2016, we amended our license agreement (the "Amendment") with Purpose whereby we acquired the development and commercialization rights to NeoCart in Japan. Under the Amendment, we assume sole

responsibility for the development and commercialization of all or any portion our products in Japan. In addition, the amended agreement provides us with an exclusive, perpetual (with respect to patent rights, for the full term of each patent licensed) and sublicensable license, under Purpose's patent rights and technology relating to their tissue processor, in Japan, to make, use, sell, import and otherwise exploit products or services covered by claims of such Purpose patents or Purpose's technology, in connection with articular cartilage, ligaments, tendons and meniscus. The Amendment also terminates the license that Purpose held under the original license agreement to develop and commercialize Histogenics' patents and technology in Japan.

Pursuant to the Amendment, we are obligated to pay Purpose payments of up to $10 million in the event certain milestones are satisfied as well as a royalty payment in the low single digits on the net sales in Japan for Histogenics products that rely on a Purpose patent or incorporate or necessarily rely upon any Purpose technology. Such royalty payment shall be reduced if the applicable Histogenics products do not rely on an outstanding Purpose patent.

The other terms of the agreement with Purpose remain in effect including our ability outside of Japan to (1) make, use and sell products or services covered by claims of Purpose's patents and (2) use and create derivative works of Purpose's technology for the design, development, manufacture, testing, support and commercialization of any product or service that incorporates or builds upon Purpose's technology, in each case, only in connection with articular cartilage, ligaments, tendons and meniscus. Purpose reserves the right to sell its single unit exogenous tissue processer machines to research institutes for general but noncommercial use anywhere in the world.

As part of our agreement with Purpose, they continue to manufacture and sell single unit exogenous tissue processor machines to us. In addition, Purpose exclusively sublicensed to us its rights and obligations under the BWH-Purpose license, as amended from time to time. Under the Purpose-BWH license agreement, BWH granted Purpose an exclusive, royalty-bearing, worldwide, sublicensable license, under its rights in licensed patents and patent applications co-owned by BWH and Purpose, to make, use and sell (1) apparatuses for cultivating a cell or tissue, (2) tissue or cell products made using such apparatuses, (3) tissue or cell products made using processes for cultivating a cell or tissue as disclosed in the licensed patents and patent applications and (4) any apparatus that cultivates cells or tissues using such processes, in each case, whose manufacture, use, or sale is covered by the claims of the licensed patents and patent applications, only for therapeutic use. BWH may terminate this agreement if Purpose, itself or through its sublicensees, does not achieve commercial distribution and sale of the licensed products in the United States by December 31, 2019. In return for extending the termination period through December 31, 2019 pursuant to an amendment effective November 2015, we agreed to pay BWH $50,000 in November 2015 and three annual payments of $30,000 on the anniversary of the effective date of such amendment for the three years thereafter.

Pursuant to our sublicense from Purpose, we are obligated to pay royalties and milestone payments and sublicense payments due on the BWH-Purpose license agreement. We have paid minimum royalty amounts of $200,000 and sublicense payments of $175,000 through December 31, 2016. Purpose agreed to pay BWH a royalty rate in the low single digits of our net sales of licensed products, subject to a minimum of $20,000 annually, until the license agreement terminates or until royalty payments no longer have to be made. Purpose is obligated to make one additional sublicense payment of $25,000 and milestone payments to BWH of (1) $75,000 upon the first patient treated in Phase 3 clinical trials for each licensed product or licensed process and (2) $75,000 upon final FDA approval for each licensed product or licensed process.

The agreement remains in effect for the life of the licensed patents, expected to be until October 19, 2028. Purpose may terminate the agreement by providing written notice to BWH at least 60 days in advance. BWH has the right to terminate the agreement if Purpose fails to make minimum royalty payments or other payments or otherwise breaches the agreement and such breach is not cured within 30 days of BWH providing notice to Purpose. Upon termination of the BWH-Purpose license agreement, our sublicense will convert to a nonexclusive

license to Purpose's interest in the licensed products or processes. Upon written notice to Purpose of our intent to stop using the technology sublicensed to us in the BWH-Purpose license, Purpose will reassume all responsibility under the BWH-Purpose license.

Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH

In May 2005, we entered into a worldwide license agreement with Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (collectively, Angiotech) for the right, under Angiotech's licensed patents and patent applications and technical information, to make, use and sell any product that includes both our intellectual property and CT3 for the repair of articular cartilage, ligament, meniscus or tendon damage, including related osteochrondal defects. The license excludes any product in which one nonliving ingredient is included in CT3 for the primary purpose of producing a physiological, metabolic or biological effect in mammals. The license grant was made exclusive under the fifth amendment to the license agreement that came into effect in August 2010 after we paid $1.0 million to Angiotech. We have obligations to supply CT3 to Angiotech under certain terms and conditions, and Angiotech is entitled to use any data and results obtained from any clinical studies conducted by us with respect to CT3.

As a license fee, we issued to Angiotech certain warrants to purchase from us shares of common stock, subject to certain anti-dilution protections. These warrants are no longer outstanding. We paid $1.0 million to Angiotech to make the license grant under the agreement exclusive. In addition, we paid four annual patent fees of $50,000 each as of December 31, 2016. We are also obligated to pay an additional fee of $3.0 million within 30 days after we receive regulatory approval from the FDA for a licensed product. As further consideration for the license, we also agreed to pay royalties at percentage rates of single digits of net sales of NeoCart and certain other products. We were able to reduce royalties from percentage rates of net sales in the double digits to this rate after making revenue share reduction payments that totaled $2.0 million.

The agreement terminates on the earlier of May 12, 2035 and expiration of all royalty payment obligations under the agreement. Either party has the right to terminate the agreement if the other party materially breaches the agreement and fails to cure such breach within 30 days from the date of notice of such breach (ten days in the case of non-payment). We may also terminate the agreement by giving at least one year's notice. Angiotech may also terminate the agreement if we or any of our affiliates or sublicensees challenge the validity of Angiotech's patents rights or rights to improvements (or directly or indirectly support any such challenge), or if we are acquired by or merge with a third party that has developed or is marketing, or has an affiliate that has developed or is marketing, a competitive product prior to such acquisition or merger and the resulting or surviving entity post-acquisition or merger fails to either continue to develop or sell licensed product at a level reasonably similar to the development or sale that was occurring prior to the acquisition or merger, during the six-month period following the acquisition or merger. Competitive product means, in a given country, (1) a drug or biologic approved for marketing or in Phase 3 clinical development, (2) a 510(k), or foreign equivalent, device approved for marketing, or (3) an FDA Premarket Approval, or foreign equivalent, device approved for marketing or in pivotal study clinical development, other than a licensed product, that acts (or is being developed to act) for one or more target label indications substantially similar to one or more approved or target label indications for a licensed product.

Koken Co., Ltd.

In March 2013, we entered into a license agreement with Koken Co., Ltd. (Koken) for a non-exclusive, non-transferable and non-sublicensable right to use its know-how related to the process for manufacturing atelocollagen honeycomb sponge materials, which we use in our scaffolds. Pursuant to the agreement, we paid Koken a fee in March 2013 for such right. Koken may terminate this agreement if we fail to perform any obligation under the agreement and such failure remains uncured for more than 30 days, if we become insolvent, bankrupt, go into liquidation or receivership, or if we file for bankruptcy or a petition in bankruptcy is filed against us.

The Board of Trustees of The Leland Stanford Junior University

In April 2001, we entered into a license agreement with The Board of Trustees of The Leland Stanford Junior University (Stanford) for patent rights relating to the restoration of articular cartilage. Our agreement with Stanford provides us with a worldwide license to make and sell products covered by claims of the licensed patents for growth, ontogenesis, and regeneration of cartilaginous tissues and collagen. Under the agreement, Stanford agreed not to grant further licenses to such rights in such field.

We paid Stanford $30,000 upon execution of the agreement and, as of December 31, 2016, $421,000 as reimbursement for patent-related costs incurred by Stanford. We are required to pay Stanford a yearly royalty fee of $10,000, which is creditable against earned royalty payments due on net sales of that year. We have paid $140,000 in yearly royalty fees through December 31, 2016. Stanford is also entitled to a low single digit percentage rate of our net sales in royalties. We paid Stanford milestone payments of $35,000 upon issuance of the first licensed patent and $50,000 upon initiation of Phase 1 clinical trials of the licensed product in the first field that requires separate regulatory authority clinical approval. We have paid Stanford a milestone payment of $50,000 upon initiation of Phase 1 clinical trials of the licensed product in other fields that requires separate regulatory authority clinical approval, and are obligated to pay an additional milestone payment of $300,000 upon FDA marketing approval of the first licensed product.

The agreement terminates on the date that the last of the licensed patents expire, expected to be January 25, 2021. We may terminate the agreement by giving Stanford notice in writing at least 30 days in advance of the date of termination. Stanford has the right to terminate the agreement if we are in default in payment of royalty or providing of reports, if we are in breach of any other provisions of the agreement, or if we provide a false report to Stanford, and in each case, we fail to remedy such default, breach or false report within 30 days after written notice thereof. We are obligated to have licensed products relating to growth, ontogenesis and regeneration of cartilaginous tissue available for commercial sale by December 31, 2015. If we fail to fulfill such obligation, Stanford may terminate our rights with respect to the applicable part of the field of use. Stanford may also terminate the agreement if we or our sublicensees have not sold licensed products for a continuous period of one year after the first commercial sale of licensed products.

Advanced BioMatrix, Inc.

In April 2014, we entered into an agreement with Advanced BioMatrix, Inc. (ABM) for a nonexclusive, nontransferable (except as expressly provided in the agreement), non-sublicensable (except as provided in the agreement), perpetual, irrevocable, worldwide, royalty-free right and license to use its technology related to certain collagen solutions and to make, use, sell and otherwise exploit collagen solutions produced using such technology, solely for the development and commercialization, including generation, implantation and use, of engineered tissue and biomaterials in the field of orthopedics. Pursuant to the agreement, we paid fees in April and November 2014 and will reimburse ABM for mutually agreed upon expenses for such rights and services to be performed by ABM for us in connection with such technology. This agreement will remain in effect until we or ABM provides written notice to terminate the agreement. Either party may terminate the agreement if the other party materially breaches any material term of the agreement and fails to cure such breach within 45 days after receiving notice of such breach.

Intrexon Corporation

In September 2014, we entered into our ECC with Intrexon governing a “channel collaboration” arrangement in which we will use Intrexon’s current and future proprietary technology directed towards the design, identification, culturing and/or production of genetically modified cells (Technology). The ECC grants us an exclusive worldwide license to utilize Intrexon’s Technology to develop and commercialize allogeneic genetically modified chondrocyte cell therapeutics for the treatment or repair of damaged articular hyaline cartilage in humans. Under the ECC, we agreed that we would not pursue, outside of our relationship with Intrexon, the utilization of any synthetic biology platform in conjunction with a universal cell line for the development or commercialization of any products for the purpose of treating and/or repairing damaged articular

hyaline cartilage in humans where such products would compete with commercial products resulting from our collaboration with Intrexon.

Contemporaneously with entering into the ECC, we issued a 6% convertible promissory note (the Note) in the principal amount of $10.0 million as partial consideration for the execution and delivery of our ECC with Intrexon. The Note converted into 918,206 shares of our common stock in connection with our initial public offering.

The ECC provides for the establishment of committees comprised of equal numbers of representatives from Intrexon and our company that will govern activities in the areas of project establishment, chemistry, manufacturing and controls, clinical and regulatory matters, commercialization efforts and intellectual property.

Pursuant to the ECC, we are responsible for the research and development costs incurred by Intrexon associated with the development of product candidates developed under our collaboration, the effect of which may increase the level of our overall research and development expenses. Subject to certain exceptions, we will be responsible for, among other things, funding the further anticipated development of cell lines toward the goal of commercialization, conducting preclinical and clinical development of candidate product(s), as well as for other aspects of manufacturing and the commercialization of the product(s). Among other things, Intrexon will be responsible for technology discovery efforts and cell line development. We will reimburse Intrexon for 50% of the costs it incurs under the ECC pursuant to a jointly agreed upon work plan prior to the acceptance by the FDA or equivalent regulatory agency in an applicable jurisdiction of an IND or equivalent regulatory filing for a collaboration product, and the remaining 50% of such costs after such filing acceptance by the FDA or equivalent regulatory authority. As of December 31, 2016, we have paid Intrexon $2.7 million in research and development expenses and have an additional $3.4 million payable.

We will pay Intrexon a royalty fee of a low double digit percentage of the gross profit derived from the sale of products developed from ECC. We will also pay Intrexon an intermediate double digit percentage of sublicensing revenue we may receive pursuant to certain conditions set forth in the ECC.

We have also agreed to make certain payments to Intrexon upon our achievement of designated commercialization and sales milestones in the form of shares of our common stock (based upon the fair market value of the shares otherwise required to be issued) or, at our option, a cash payment including up to $12 million of development and regulatory milestones and up to $22.5 million of commercialization milestones. In the event that we consummate an acquisition of our company prior to paying to Intrexon any one or more of the milestone payments and the ECC is transferred or assigned to the buyer in connection with such acquisition, then all subsequent milestone payments will thereafter each be payable only in cash to Intrexon.

The ECC shall continue until it is terminated pursuant to certain triggering events, as specified in the ECC. We may voluntarily terminate the ECC at any time upon 90 days' written notice to Intrexon. Either party may terminate the ECC upon 60 days' written notice following a material breach, and failure to cure such breach by the other party. Intrexon may also terminate the ECC if: we fail to pursue therapies demonstrably superior to existing therapies and those under development by us using the Technology to commercialize products under the ECC; or we attempt to assign the ECC, other than as permitted under the ECC.

Upon termination of the ECC, we may continue to develop and commercialize any product developed under the ECC that, at the time of termination satisfies at least one of the following criteria: (i) the product is being sold by us triggering profit sharing payments under the ECC to Intrexon; (ii) the product has received regulatory approval; (iii) the product is a subject of an application for regulatory approval in the field covered by the ECC that is pending before the applicable regulatory authority; and (iv) the particular product is the subject of at least an ongoing or completed human clinical trial wherein the product was implanted into at least one patient.

Competition

The regenerative medicine industry is characterized by innovative science, rapidly advancing technologies and a strong emphasis on proprietary products. While we believe that our technology, development experience,

scientific knowledge and intellectual property portfolio provide us with competitive advantages, we face potential competition from many different sources, including major pharmaceutical, specialty pharmaceutical, biotechnology and regenerative medicine companies, academic institutions, governmental agencies and public and private research institutions.

The competitive landscape in the field of articular cartilage repair is emerging and has stimulated a substantial amount of interest from companies developing tissue repair solutions. Companies have employed a variety of approaches to meet the goals of cartilage repair. The approaches, which represent the scientific evolution of the field, can be generally categorized in five ways: (1) non-cell-based, such as Arthrosurface's HemiCAP and Anika's Hyalofast; (2) uncultured cell-based (with or without scaffold), such as Zimmer's DeNovo NT, Arthrex's BioCartilage and Osiris' Cartiform, distributed exclusively with Arthrex; (3) cultured cell-based (without scaffold), such as Vericel's Carticel and ISTO's RevaFlex; (4) cultured cell- and scaffold-based, such as Vericel's MACI and the Aesculap division of B. Braun Medical's NovoCart 3D; and (5) cultured cell- and scaffold-based incorporating tissue engineering, such as NeoCart.

For knee cartilage repair and regeneration, the market is large and growing, driven by more knee injuries in an increasingly active population. Worldwide, many additional products are commercially available, but the majority of these products were historically only available in the EEA. Carticel and MACI are currently the only two biologic products approved by the FDA, with MACI having been approved in December 2016. Carticel was approved by the FDA in 1997 and has a restrictive label that limits its use in salvage cases. However, we believe based on public statements made by Vericel, that MACI currently does not have similar label restrictions and will replace Carticel in the market. RevaFlex and NovoCart 3D are in U.S. clinical development, and based on our internal analysis of publicly available information, we believe may be approved in 2023 and 2021, respectively. However, their early clinical data have not been published in highly regarded peer-reviewed journals and the results of their clinical development program in the U.S. are unknown. Although minimally-modified cells such as DeNovo NT, which launched in the United States in 2007, and acellular cartilage matrix products such as Cartiform and Arthrex's BioCartilage and are available in the United States, their path to market did not require a rigorous regulatory path and their clinical data to date has been sparse and commercial uptake limited. Product-less procedures such as debridement and microfracture continue to dominate the U.S. market.

Any product candidates that we successfully develop and commercialize will compete with existing therapies and new therapies that may become available in the future. Our competitors may move faster and have substantially greater financial, technical and human resources that could put them at an advantage in the development of safe and efficacious products and may help them obtain regulatory approval for their products more rapidly, as well as achieve more widespread market acceptance. We believe, however, the competitive benefits of NeoCart will allow us to position NeoCart effectively as a strong contender in the tissue repair market.

Outside the United States, many procedures and products for cartilage repair are available. However, we anticipate that many of these are unlikely to seek approval in the United States because of the rigorous and lengthy regulatory path a sponsor must pursue in order to access the market and the high-quality superiority data that must be produced.

Government Regulation

Regulatory Background on Autologous Cellular Products

The FDA does not apply a single regulatory scheme to human tissues and the products derived from human tissue. On a product-by-product basis, the FDA may regulate such products as drugs, biologics, or medical devices, in addition to regulating them as human cells, tissues, or cellular or tissue-based products (HCT/Ps), depending on whether or not the particular product triggers any of an enumerated list of regulatory factors. A fundamental difference in the treatment of products under these classifications is that the FDA generally permits HCT/Ps that do not trigger any of those regulatory factors to be commercially distributed without marketing approval. In contrast, products that trigger those factors, such as if they are more than minimally manipulated

when processed or manufactured, are regulated as drugs, biologics, or medical devices and require FDA approval. The FDA has designated NeoCart as a biologic under the jurisdiction of the Center for Biologics Evaluation and Research and market access or approval will require BLA approval.

In 1997, the FDA began requiring BLA filing for autologous cellular products and approved the already-marketed Carticel contingent on further clinical trials. In 2000, Carticel's indication narrowed to second-line therapy for patients with inadequate response to prior treatment. As of December 2011, the FDA requires evidence of clinical efficacy against approved and validated endpoints and standard of care control arm as outlined in their final guidance on the subject of cartilage repair.

The grant of marketing authorization in the EEA for products containing viable human tissues or cells such as NeoCart is governed by Regulation 1394/2007/EC on advanced therapy medicinal products, read in combination with Directive 2001/83/EC of the European Parliament and of the Council, commonly known and the Community code on medicinal products. Regulation 1394/2007/EC lays down specific rules concerning the authorization, supervision and pharmacovigilance of gene therapy medicinal products, somatic cell therapy medicinal products and tissue engineered products. Manufacturers of advanced therapy medicinal products must demonstrate the quality, safety and efficacy of their products to the European Medicines Agency (EMA), which is required to provide an opinion regarding the application for marketing authorization. The European Commission grants or refuses marketing authorization in light of the opinion delivered by the EMA.

Applicants for marketing authorization for medicinal products in the EEA are required to submit applications for marketing authorization based on the ICH Common Technical Document and must demonstrate the safety, quality and efficacy of the medicinal product for which the marketing authorization is sought. The application must include the results of pre-clinical tests and clinical trials conducted with the medicinal product. The conduct of clinical trials in the EEA is governed by Directive 2001/20/EC which imposes obligations and procedures that are similar to those provided in applicable U.S. laws. The obligations provided in the European Union (EU) Good Clinical Practice rules and EU Good Laboratory Practice must also be respected during conduct of the trials. Clinical trials must be approved by the competent regulatory authorities and the competent Ethics Committees in the EU Member States in which the clinical trials take place. Moreover, applicants are required to demonstrate that studies have been conducted with the medicinal product in the pediatric population as provided by a Pediatric Investigation Plan approved by the Pediatric Committee of the EMA. Alternatively, confirmation that the applicant has obtained a waiver or deferral for the conduct of these studies must be provided.

Anticipated FDA Regulatory and Approval Process for NeoCart

We anticipate NeoCart, if approved, to be the first autologous cell- and scaffold-based product in the U.S. market to have been studied in a randomized controlled trial with a rigorous responder analysis under an approved SPA.

The FDA approved the NeoCart Phase 3 study design under the SPA process and concluded that the trial "design and planned analyses … sufficiently address the studies' objectives … these studies are adequately designed to provide the necessary data that … could support a license application submission." We anticipate the SPA to be binding on the FDA review division, with limited exceptions provided by FDA guidance, such as the FDA "determines that a substantial issue essential to determining the safety or efficacy of the [product] has been identified after the testing has begun," or if we fail to follow the agreed-upon protocol.

Reimbursement

In both domestic and foreign markets, sales of any regulatory-approved products depend in part upon the availability of reimbursement from third-party payors. Third-party payors include government health programs, such as Medicare and Medicaid, private health insurers and managed care providers, and other organizations. Reimbursement policy involves coding, coverage and payment decisions and our business strategy is to produce the necessary information for optimal decision-making by payors.

Coding: While reimbursement policy for NeoCart is uncertain at this point, we believe that the existing Current Procedural Terminology, Healthcare Commission Procedure Coding System and International Classification of Diseases, Ninth Edition coding options for ACI are sufficiently broad that they could apply to NeoCart.

Coverage: Our goal is to demonstrate improved health outcomes (e.g., improved patient outcomes and quality of life on several parameters, lower total costs including lower overall utilization of healthcare services and faster return to work) for patients receiving NeoCart compared to microfracture, an important element in securing coverage decisions by payors (Medicare and private payors).

Payment: Analysis of recent trends in ACI coverage (discharge data) suggest that patients between 18 and 64 years of age constitute the majority of the market for ACI, resulting in a market dominated by private payors. Only 10% to 20% of ACI patients are estimated to be 65 years of age and older. While limited data is available for private payor reimbursement of ACI, these payors typically reimburse inpatient procedures with bundling mechanisms similar to Medicare Severity Diagnosis Related Groups. In addition, some private payors also tend to use Medicare rates as benchmarks when setting their own fee schedules. In preparation for the potential launch of NeoCart, if ever, we are developing a reimbursement dossier to facilitate the introduction of NeoCart into the marketplace. In November 2014, we submitted a protocol amendment to the FDA to augment additional Health Economics Outcomes Research data to further support our future reimbursement initiatives. These data would collect additional key economic data and outcomes associated with quality of life, productivity and return to work status, and healthcare resource utilization related to direct and indirect costs. Upon receipt of this data we plan to provide objective clinical data, patient-reported quality of life data and health economic data demonstrating NeoCart's value to assist in optimizing payment decisions for NeoCart.

Government Regulation Overview

United States

Overview

In the United States, the FDA regulates biological products under the Federal Food, Drug, and Cosmetic Act and the Public Health Service Act and related regulations. Biological products are also subject to other federal, state, local, and foreign statutes and regulations. The FDA and comparable regulatory agencies in state and local jurisdictions and in foreign countries impose substantial requirements upon the clinical development, manufacture and marketing of biological products. These agencies and other federal, state, local, and foreign entities regulate research and development activities and the testing, manufacture, quality control, safety, effectiveness, packaging, labeling, storage, distribution, record keeping, reporting, approval, advertising and promotion of our products. Failure to comply with the applicable U.S. regulatory requirements at any time during the product development process, including clinical testing, approval process or after approval may subject an applicant to administrative or judicial sanctions.

Government regulation may delay or prevent marketing of product candidates for a considerable period of time and impose costly procedures upon our activities. The testing and approval process requires substantial time, effort, and financial resources, and we cannot be certain that the FDA or any other regulatory agency will grant approvals for NeoCart or any future product candidates on a timely basis, if at all. The FDA's policies may change and additional government regulations may be enacted that could prevent or delay regulatory approval of NeoCart or any future product candidates or approval of new disease indications or label changes. We cannot predict the likelihood, nature or extent of adverse governmental regulation that might arise from future legislative, judicial, or administrative action, either in the United States or abroad.

Marketing Approval

The process required by the FDA before biological products may be marketed in the United States generally involves the following:

- completion of nonclinical laboratory and animal tests according to good laboratory practices, and applicable requirements for the humane use of laboratory animals or other applicable regulations;
- submission to the FDA of an IND application which must become effective before human clinical trials may begin;
- performance of adequate and well-controlled human clinical trials according to the FDA's regulations commonly referred to as good clinical practices (GCP), and any additional requirements for the protection of human research patients and their health information, to establish the safety and efficacy of the proposed biological product for its intended use or uses;
- submission to the FDA of a BLA for marketing approval that includes substantive evidence of safety, purity, and potency from results of nonclinical testing and clinical trials;
- satisfactory completion of an FDA pre-approval inspection of manufacturing facilities where the biological product is produced to assess compliance with good manufacturing practices (GMP) to assure that the facilities, methods and controls are adequate to preserve the biological product's identity, strength, quality and purity and, if applicable, the FDA's current good tissue practices (GTP) for the use of human cellular and tissue products to prevent the introduction, transmission or spread of communicable diseases;
- potential FDA audit of the nonclinical study sites and clinical trial sites that generated the data in support of the BLA; and
- FDA review and approval, or licensure, of the BLA, which must occur before a biological product can be marketed or sold.

U.S. Biological Products Development Process

Before testing any biological product candidate in humans, the product candidate enters the nonclinical testing stage. Nonclinical tests include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies to assess the potential safety and activity of the product candidate. The conduct of the nonclinical tests must comply with federal regulations and requirements including good laboratory practices.

Prior to commencing the first clinical trial, the clinical trial sponsor must submit the results of the nonclinical tests, together with manufacturing information, analytical data, any available clinical data or literature and a proposed clinical protocol, to the FDA as part of an initial IND application. Some nonclinical testing may continue even after the IND application is submitted. The IND application automatically becomes effective 30 days after receipt by the FDA unless the FDA, within the 30-day time period, raises concerns or questions about the conduct of the clinical trial and places the clinical trial on a clinical hold. In such case, the IND application sponsor must resolve any outstanding concerns with the FDA before the clinical trial may begin. Further, an IRB for each site proposing to conduct the clinical trial must review and approve the plan for any clinical trial before it commences at that site. An IRB is charged with protecting the welfare and rights of study subjects and considers such items as whether the risks to individuals participating in the clinical trials are minimized and are reasonable in relation to anticipated benefits. The IRB also approves the form and content of the informed consent that must be signed by each clinical trial subject or his or her legal representative and must monitor the clinical trial until completed. The FDA or IRB may impose clinical holds on a biological product candidate at any time before or during clinical trials due to safety concerns or non-compliance. If the FDA imposes a clinical hold, trials may not recommence without FDA or IRB authorization and then only under terms authorized by the FDA and IRB. Accordingly, we cannot be sure that submission of an IND application will result in the FDA allowing clinical trials to begin or that, once begun, issues will not arise that will result in the suspension or termination of such trials.

Clinical trials involve the administration of the biological product candidate to healthy volunteers or patients under the supervision of qualified investigators, generally physicians not employed by or under the trial sponsor's control. 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, including stopping rules that assure a clinical trial will be stopped if certain adverse events should occur. Each protocol and any amendments to the protocol must be submitted to the FDA as part of the IND application and to the IRB.

For purposes of BLA approval, human clinical trials are typically conducted in three sequential phases that may overlap:

- Phase 1—The biological product is initially introduced into healthy human patients and tested for safety. In the case of some products for severe or life-threatening diseases, especially when the product may be too inherently toxic to ethically administer to healthy volunteers, the initial human testing is conducted in patients. These trials may also provide early evidence on effectiveness.
- Phase 2—These trials are conducted in a limited number of patients in the target population to identify possible adverse effects and safety risks, to preliminarily evaluate the efficacy of the product for specific targeted diseases and to determine dosage tolerance and optimal dosage. Multiple Phase 2 clinical trials may be conducted by the sponsor to obtain information prior to beginning larger and more expensive Phase 3 clinical trials.
- Phase 3—Phase 3 trials are undertaken to provide statistically significant evidence of clinical efficacy and to further evaluate dosage, potency and safety in an expanded patient population at multiple clinical trial sites. They are performed after preliminary evidence suggesting effectiveness of the product has been obtained, and are intended to establish the overall benefit-risk relationship of the investigational product and to provide an adequate basis for product approval and labeling.

Post-approval clinical trials, sometimes referred to as Phase 4 clinical trials, may be conducted after initial marketing approval. These trials may be required by the FDA as a condition of approval and are used to gain additional experience from the treatment of patients in the intended therapeutic indication, particularly for long-term safety follow-up. The FDA now has express statutory authority to require post-market clinical trials to address safety issues. All of these trials must be conducted in accordance with GCP requirements in order for the data to be considered reliable for regulatory purposes.

During all phases of clinical development, regulatory agencies require extensive monitoring and auditing of all clinical activities, clinical data and clinical trial investigators. Annual progress reports detailing the results of the clinical trials must be submitted to the FDA. Written IND safety reports must be promptly submitted to the FDA and the investigators for serious and unexpected adverse events; any findings from other studies, tests in laboratory animals or in vitro testing that suggest a significant risk for human patients; or any clinically important increase in the rate of a serious suspected adverse reaction over that listed in the protocol or investigator brochure. The sponsor must submit an IND safety report within 15 calendar days after the sponsor determines that the information qualifies for reporting. The sponsor also must notify the FDA of any unexpected fatal or life-threatening suspected adverse reaction within seven calendar days after the sponsor's initial receipt of the information.

Phase 1, Phase 2 and Phase 3 clinical trials may not be completed successfully within any specified period, if at all. Regulatory authorities, a data safety monitoring board or the sponsor may suspend a clinical trial at any time on various grounds, including a finding that the participants 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 biological product has been associated with unexpected serious harm to patients.

Our ongoing and planned clinical trials for our product candidates may not begin or be completed on schedule, if at all. Clinical trials can be delayed for a variety of reasons, including delays in:

- obtaining regulatory approval to commence a trial;
- reaching agreement with third-party clinical trial sites and their subsequent performance in conducting accurate and reliable trials on a timely basis;
- obtaining IRB approval to conduct a trial at a prospective site;
- recruiting patients to participate in a trial; and
- supply of the biological product.

Typically, if a biological product is intended to treat a chronic disease, as is the case with NeoCart, safety and efficacy data must be gathered over an extended period of time, which can range from six months to three years or more. Success in early stage clinical trials does not ensure success in later stage clinical trials. Data obtained from clinical activities is not always conclusive and may be susceptible to varying interpretations, which could delay, limit or prevent regulatory approval.

Concurrent with clinical trials, companies usually complete additional animal studies and must also develop additional information about the physical characteristics of the biological product as well as finalize a process for manufacturing the product in commercial quantities in accordance with GMP requirements. To help reduce the risk of the introduction of adventitious agents with the use of biological products, the Public Health Service Act emphasizes the importance of manufacturing control for products whose attributes cannot be precisely defined. The manufacturing process must be capable of consistently producing quality batches of the product candidate and, among other things, the sponsor must develop methods for testing the identity, strength, quality, potency and purity of the final biological product. Additionally, appropriate packaging must be selected and tested and stability studies must be conducted to demonstrate that the biological product candidate does not undergo unacceptable deterioration over its shelf life.

U.S. Review and Approval Processes

In order to obtain approval to market a biological product in the United States, a BLA must be submitted to the FDA that provides data establishing to the FDA's satisfaction the safety, purity and potency of the investigational biological product for the proposed indication. The application includes all data available from nonclinical studies and clinical trials, including negative or ambiguous results as well as positive findings, together with detailed information relating to the product's manufacture and composition, and proposed labeling, among other things. The testing and approval processes require substantial time and effort, and there can be no assurance that the FDA will accept the BLA for filing and, even if filed, that any approval will be granted on a timely basis, if at all.

Under the Prescription Drug User Fee Act (PDUFA), each BLA must be accompanied by a user fee. The FDA adjusts the PDUFA user fees on an annual basis. According to the FDA's fee schedule, the user fee for an application requiring clinical data, such as a BLA, will be $2.4 million for 2016. PDUFA also imposes an annual product fee for biologics ($114,450 for 2016), and an annual establishment fee ($585,200 for 2016) on facilities used to manufacture prescription biologics. 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 BLAs for products designated as orphan drugs, unless the product also includes a non-orphan indication.

The FDA has 60 days from its receipt of a BLA to determine whether the application will be accepted for filing based on the FDA's threshold determination that the application is sufficiently complete to permit substantive review. The FDA may refuse to file any BLA that it deems incomplete or not properly reviewable at the time of submission and may request additional information. In this event, the BLA must be resubmitted with the

additional information. The resubmitted application also is subject to review before the FDA accepts it for filing. After the BLA submission is accepted for filing, the FDA reviews the BLA to determine, among other things, whether the proposed product is safe and potent, or effective, for its intended use, and has an acceptable purity profile, and whether the product is being manufactured in accordance with GMPs to assure and preserve the product's identity, safety, strength, quality, potency, and purity, and biological product standards. The FDA may refer applications for novel biological products or biological products that 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, if so, under what conditions. The FDA is not bound by the recommendations of an advisory committee, but it considers such recommendations carefully when making decisions.

Before approving a BLA, the FDA will inspect the facilities at which the product is manufactured. The FDA will not approve the product unless it determines that the manufacturing processes and facilities are in compliance with GMP requirements and adequate to assure consistent production of the product within required specifications. For a human cellular or tissue product, the FDA also will not approve the product if the manufacturer is not in compliance with the GTP. These are FDA regulations that govern the methods used in, and the facilities and controls used for, the manufacture of HCT/Ps, which are human cells or tissue intended for implantation, transplant, infusion, or transfer into a human recipient. The primary intent of the GTP requirements is to ensure that cell and tissue based products are manufactured in a manner designed to prevent the introduction, transmission and spread of communicable disease. FDA regulations also require tissue establishments to register and list their HCT/Ps with the FDA and, when applicable, to evaluate donors through screening and testing. Additionally, before approving a BLA, the FDA may inspect one or more clinical sites to assure that the clinical trials were conducted in compliance with IND application study requirements and GCP. To assure GMP, GTP and GCP compliance, an applicant must incur significant expenditure of time, money and effort. If the FDA determines the manufacturing process or manufacturing facilities are not acceptable, it typically will outline the deficiencies and often will require the facility to take corrective action and provide documentation evidencing the implementation of such corrective action. This may significantly delay further review of the application. If the FDA finds that a clinical site did not conduct the clinical trial in accordance with GCP, the FDA may determine the data generated by the clinical site should be excluded from the primary efficacy analyses provided in the BLA and request additional testing or data. Additionally, notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

The FDA also has authority to require a Risk Evaluation and Mitigation Strategy (REMS) from manufacturers to ensure that the benefits of a biological product outweigh its risks. A sponsor may also voluntarily propose a REMS as part of the BLA submission. The need for a REMS is determined as part of the review of the BLA. Based on statutory standards, elements of a REMS may include "dear doctor letters," a medication guide, more elaborate targeted educational programs, and in some cases restrictions on distribution. These elements are negotiated as part of the BLA approval, and in some cases may delay the approval date. Once adopted, REMS are subject to periodic assessment and modification.

After the FDA completes its initial review of a BLA, it will communicate to the sponsor that the biological product will either be approved, or it will issue a complete response letter to communicate that the BLA will not be approved in its current form. The complete response letter usually describes all of the specific deficiencies in the BLA identified by the FDA. The deficiencies identified may be minor, for example, requiring labeling changes, or major, for example, requiring additional clinical trials. Additionally, the complete response letter may include recommended actions that the applicant might take to place the applicant in a condition for approval. If a complete response letter is issued, the applicant may either resubmit the BLA, addressing all of the deficiencies identified in the letter, or withdraw the application.

The FDA may not grant approval on a timely basis, or at all. We may encounter difficulties or unanticipated costs in our efforts to secure necessary governmental approvals, which could delay or preclude us from marketing our products. The testing and approval process for a biological product usually takes several years to complete.

One of the performance goals agreed to by the FDA under PDUFA is to review 90% of standard BLAs within ten months of the 60-day filing date and 90% of priority BLAs within six months of the 60-day filing date, whereupon a review decision is to be made. The FDA does not always meet its PDUFA goal dates for standard and priority BLAs and its review goals are subject to change from time to time. The review process and the PDUFA goal data may be extended by three months if the FDA requests or the BLA applicant otherwise provides additional information or clarification regarding information already provided in the submission within the last three months before the PDUFA goal date.

Even if a product candidate receives regulatory approval, the approval may be limited to specific disease states, patient populations and dosages, or the indications for use may otherwise be limited, which could restrict the commercial value of the product. Further, the FDA may require that certain contraindications, warnings, or precautions be included in the product labeling. The FDA may impose restrictions and conditions on product distribution, prescribing or dispensing in the form of a risk management plan, or otherwise limit the scope of any approval. In addition, the FDA may require Phase 4 post-marketing clinical trials, designed to further assess a biological product's safety and effectiveness, and testing and surveillance programs to monitor the safety of approved products that have been commercialized. Further, even after regulatory approval is obtained, later discovery of previously unknown problems with a product may result in the imposition of new restrictions on the product or even complete withdrawal of the product from the market. Delay in obtaining, or failure to obtain and maintain, regulatory approval for NeoCart, or obtaining approval but for significantly limited use, would harm our business.

FDA Post-Approval Requirements

Maintaining substantial compliance with applicable federal, state, local and foreign statutes and regulations requires the expenditure of substantial time and financial resources. Rigorous and extensive FDA regulation of biological products continues after approval, particularly with respect to GMP. We may rely, in the future, on third parties for the production of clinical and commercial quantities of any future products that we may commercialize. Manufacturers of our products are required to comply with applicable requirements in the GMP regulations, including quality control and quality assurance and maintenance of records and documentation. We cannot be certain that we or our present or future suppliers will be able to comply with the GMP and other FDA regulatory requirements. Other post-approval requirements applicable to biological products include reporting of GMP deviations that may affect the identity, potency, purity and overall safety of a distributed product, record-keeping requirements, reporting of adverse effects, reporting updated safety and efficacy information and complying with electronic record and signature requirements. After a BLA is approved, the product also may be subject to official lot release. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. The FDA also may perform certain confirmatory tests on lots of some products, such as viral vaccines, before releasing the lots for distribution by the manufacturer. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency and effectiveness of biological products.

Discovery of previously unknown problems or the failure to comply with the applicable regulatory requirements, by us or our suppliers, may result in restrictions on the marketing of a product or withdrawal of the product from the market as well as possible civil or criminal sanctions and adverse publicity. FDA sanctions could include refusal to approve pending applications, suspension or revocation of an approval, clinical hold, warning or

untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, refusals of government contracts, mandated corrective advertising or communications with doctors, debarment, restitution, disgorgement of profits or civil or criminal penalties. Any agency or judicial enforcement action could have a material adverse effect on us.

Biological product manufacturers and other entities involved in the manufacture and distribution of approved biological products are required to register their facilities with the FDA and certain state agencies, and are subject to periodic unannounced inspections by the FDA and certain state agencies for compliance with GMPs and other laws. In addition, changes to the manufacturing process or facility generally require prior FDA approval before being implemented and other types of changes to the approved product, such as adding new indications and additional labeling claims, are also subject to further FDA review and approval.

Labeling, Marketing and Promotion

The FDA closely regulates the labeling, marketing and promotion of biological products, including direct-to-consumer advertising, promotional activities involving the internet, and industry-sponsored scientific and educational activities. While doctors are free to prescribe any product approved by the FDA for any use, a company can only make claims relating to safety and efficacy of a biological product that are consistent with FDA approval, and the company is allowed to market a biological product only for the particular use and treatment approved by the FDA. In addition, any claims we make for our products in advertising or promotion must be appropriately balanced with important safety and risk information and otherwise be adequately substantiated. Failure to comply with these requirements can result in adverse publicity, warning letters, corrective advertising, injunctions, seizures, potential civil and criminal penalties and exclusion from government healthcare programs.

Anti-Kickback and False Claims Laws

In the United States, the research, manufacture, distribution, sale and promotion of biological products are potentially subject to regulation by various federal, state and local authorities in addition to the FDA, including the Centers for Medicare & Medicaid Services, other divisions of the U.S. Department of Health and Human Services (for example, the Office of Inspector General), the U.S. Department of Justice, state Attorneys General, and other federal, state and local government agencies. For example, sales, marketing and scientific/educational grant programs must comply with the Anti-Kickback Statute, the False Claims Act, the privacy regulations promulgated under the Health Insurance Portability and Accountability Act and similar state laws. Pricing and rebate programs must comply with the Medicaid Drug Rebate Program requirements of the Omnibus Budget Reconciliation Act, and the Veterans Health 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. All of these activities are also potentially subject to federal and state consumer protection and unfair competition laws.

As noted above, in the United States, we are subject to complex laws and regulations pertaining to healthcare “fraud and abuse,” including the Anti-Kickback Statute, the False Claims Act and other state and federal laws and regulations. The Anti-Kickback Statute makes it illegal for any person, including a biological product manufacturer (or a party acting on its behalf), to knowingly and willfully solicit, receive, offer, or pay any remuneration that is intended to induce the referral of business, including the purchase or order of an item 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, many states have adopted laws similar to the Anti-Kickback Statute. Some of these state prohibitions apply to the referral of patients for healthcare services reimbursed by any insurer, not just federal healthcare programs such as Medicare and Medicaid. Due to the breadth of these federal and state anti-kickback laws and the potential for additional legal or regulatory change in this area, it is possible that our future sales and marketing practices or our future relationships with physicians might be challenged under anti-kickback laws, which could harm us. Because we intend to

commercialize products that could be reimbursed under a federal healthcare program and other governmental healthcare programs, we plan to develop a comprehensive compliance program that establishes internal controls to facilitate adherence to the rules and program requirements to which we will or may become subject.

The False Claims Act prohibits anyone from, among other things, knowingly presenting, or causing to be presented, for payment to federal programs (including Medicare and Medicaid) claims for items or services, including biological products, that are false or fraudulent. Although we likely would not submit claims directly to payers, manufacturers can be held liable under these laws if they are deemed to "cause" the submission of false or fraudulent claims by, for example, providing inaccurate billing or coding information to customers or promoting a product off-label. In addition, our future 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 coverage and reimbursement for our products and the sale and marketing of our products, are subject to scrutiny under this law. For example, pharmaceutical companies have been prosecuted under the False Claims Act in connection with their off-label promotion of drugs. Penalties for a False Claims Act violation include three times the actual damages sustained by the government, plus mandatory civil penalties of between $5,500 and $11,000 for each separate false claim, the potential for exclusion from participation in federal healthcare programs, and, although the federal False Claims Act is a civil statute, conduct that results in a False Claims Act violation may also implicate various federal criminal statutes. If the government were to allege that we were, or convict us of, violating these false claims laws, we could be subject to a substantial fine and may suffer a decline in our stock price. In addition, private individuals have the ability to bring actions under the False Claims Act and certain states have enacted laws modeled after the False Claims Act.

There are also an increasing number of state laws that require manufacturers to make reports to states on pricing and marketing information. Many of these laws contain ambiguities as to what is required to comply with the laws. In addition, beginning in August 2013, a similar federal requirement requires manufacturers to track and report to the federal government certain payments made to physicians and teaching hospitals made in the previous calendar year. These laws may affect our sales, marketing, and other promotional activities by imposing administrative and compliance burdens on us. In addition, given the lack of clarity with respect to these laws and their implementation, our reporting actions could be subject to the penalty provisions of the pertinent state, and soon federal, authorities.

Other Regulations

We are also subject to numerous federal, state and local laws relating to such matters as safe working conditions, manufacturing practices, environmental protection, fire hazard control and disposal of hazardous or potentially hazardous substances. We may incur significant costs to comply with such laws and regulations now or in the future.

EU and EEA

Marketing authorization in the EU for products containing viable human tissues or cells such as NeoCart is governed by Regulation 1394/2007/EC on advanced therapy medicinal products, read in combination with Directive 2001/83/EC of the European parliament and of the Council, commonly known as the Community code on medicinal products. Regulation 1394/2007/EC establishes specific rules concerning the authorization, supervision and pharmacovigilance of gene therapy medicinal products, somatic cell therapy medicinal products and tissue engineered products. Manufacturers of advanced therapy medicinal products must demonstrate the quality, safety and efficacy of their products to the EMA which is required to provide an opinion regarding the application for marketing authorization. The European Commission grants or refuses marketing authorization in light of the opinion delivered by the EMA.

Applicants for marketing authorizations for medicinal products in the EEA are required to submit applications for marketing authorization in a form that is based on the ICH Common Technical Document, and must demonstrate the safety, quality and efficacy of the medicinal product for which the marketing authorization is sought. The application must include the results of pre-clinical tests and clinical trials conducted with the medicinal product.

The conduct of clinical trials in the EEA is governed by Directive 2001/20/EC which imposes obligations and procedures that are similar to those provided in applicable U.S. laws. The EU Good Clinical Practice rules and EU Good Laboratory Practice obligations must also be respected during conduct of the trials. Clinical trials must be approved by the competent regulatory authorities and the competent Ethics Committees in the EU Member States in which the clinical trials take place.

Moreover, applicants are required to provide evidence that studies have been conducted with the medicinal product in the pediatric population as provided by a Pediatric Investigation Plan approved by the Pediatric Committee of the EMA. Alternatively, confirmation that the applicant has obtained a waiver or deferral for the conduct of these studies must be provided. Cell-based products must also comply with Directive 2004/23/EC of the European Parliament and of the Council of March 31, 2004 on setting standards of quality and safety for the donation, procurement, testing, processing, preservation, storage and distribution of human tissues and cells (Tissues and Cells Directive). This Directive describes the conditions and quality requirements which must be applied when sourcing the cells intended for manufacturing of the cell-based medicinal product. The EU Member States have transposed the Tissues and Cells Directive into their national laws.

Locally different interpretations of the Tissue and Cells Directive have occurred during adoption of the national legal implementations by individual EU Member States. This has led to some inconsistency of approach leading to additional complexity in complying with the all-over requirements in this already difficult regulatory field.

Given the specific nature of cell-based products, the clinical development paths are less standardized than for classic pharmaceutical or biological products. Phase 1 studies are often not relevant, in particular for autologous cell-based products, since cells often need to be directly implanted into a tissue defect only present in patients. As cellular therapy Phase 3 studies are very complex to organize, often limited numbers of patients can be enrolled and follow up times can be very long, so that the design and execution of these large confirmatory trials might not always be possible to the classical extent. Upfront discussions and agreement with the regulatory authorities are an important criterion to success. It is also expected that new regulatory guidance will become available in the near future, more clearly describing the regulatory expectations.

Employees

As of December 31, 2016, we employed 47 full-time employees, including seven in research and development, nine in clinical development, 25 in manufacturing and quality control and assurance, and six in executive, general and administrative. We have never had a work stoppage, and none of our employees is represented by a labor organization or under any collective bargaining arrangements.

Corporate Information

We were originally incorporated as a Massachusetts corporation in 2000. In 2006, we underwent a corporate reorganization pursuant to which we were incorporated as a Delaware corporation. Our principal offices are located at 830 Winter Street, 3rd Floor, Waltham, Massachusetts 02451, and our telephone number is (781) 547-7900. Our website address is www.histogenics.com. Our website and the information contained on, or that can be accessed through, our website shall not be deemed to be incorporated by reference in, and are not considered part of, this annual report. You should not rely on any such information in making your decision whether to purchase our common stock.

Available Information

We file annual, quarterly, and current reports, proxy statements, and other documents with the Securities and Exchange Commission (SEC) under the Securities Exchange Act of 1934, as amended (the Exchange Act). The public may read and copy any materials that we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. Also, the SEC maintains an Internet website that contains reports, proxy and information statements, and other information regarding issuers, including us, that file electronically with the SEC. The public can obtain any documents that we file with the SEC at www.sec.gov.

Copies of each of our filings with the SEC on Form 10-K, Form 10-Q and Form 8-K and all amendments to those reports, can be viewed and downloaded free of charge at our website, www.histogenics.com as soon as reasonably practicable after the reports and amendments are electronically filed with or furnished to the SEC.

Our code of ethics, other corporate policies and procedures, and the charters of our Audit Committee, Compensation Committee and Nominating/Corporate Governance Committee are available through our website at www.histogenics.com.

ITEM 1A. *RISK FACTORS*

Investing in our common stock involves risk. You should carefully consider the risks described below as well as all the other information in this report, including the consolidated financial statements and the related notes appearing at the end of this annual report on Form 10-K, before making an investment decision. The risks and uncertainties described below are not the only risks and uncertainties we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may impair our business operations. If any of the following risks actually occur, our business, results of operations and financial condition could suffer. In that event the trading price of our common stock could decline, and you may lose all or part of your investment. The risks discussed below also include forward-looking statements and our actual results may differ substantially from those discussed in these forward-looking statements.

Risks Related to Our Business and Commercialization of Our Product Candidates

We are a clinical-stage regenerative medicine company with a limited operating history of developing late-stage product candidates. There is a limited amount of information about us upon which to evaluate our product candidates and business prospects, making an investment in our common stock unsuitable for many investors.

We are a clinical-stage regenerative medicine company, formed in 2000, with a limited operating history. Since inception we have devoted substantially all of our resources to the development of our regenerative medicine platform, the clinical and preclinical advancement of our product candidates, the creation, licensing and protection of related intellectual property rights and the provision of general and administrative support for these operations. We have not yet obtained regulatory approval for any product candidates in any jurisdiction or generated any significant revenues from product sales. If NeoCart or any of our future product candidates fails in clinical trials or preclinical development, or does not gain regulatory approval, or if our product candidates following regulatory approval, if any, do not achieve market acceptance, we may never become profitable or sustain profitability.

We commenced our first clinical trial in 2005, and we have a limited operating history developing clinical-stage regenerative medicine products upon which you can evaluate our business and prospects. In addition, besides our current ongoing Phase 3 clinical trial we have never conducted clinical trials of a size required for regulatory approvals. Further, we have not yet demonstrated an ability to successfully overcome many of the risks and uncertainties frequently encountered by companies in new and rapidly evolving fields, such as regenerative medicine. For example, to execute our current business plan we will need to successfully:

- execute our research and development strategies, including successfully enrolling and completing our clinical trial program for NeoCart;
- manufacture NeoCart and constituent products contained in NeoCart for our ongoing Phase 3 clinical trial of NeoCart;
- complete the transition of the NeoCart raw material manufacturing process to our in-house facilities and satisfy the United States Food and Drug Administration (the FDA) as to the comparability of such raw materials to those manufactured by third parties for use in our NeoCart clinical trials;
- secure additional funding as may be needed, including, without limitation, in order to complete our NeoCart Phase 3 clinical trial, and file a BLA with the FDA;
- obtain required regulatory approvals for the manufacturing and commercialization of NeoCart;
- manage our spending as costs and expenses increase due to clinical trials, regulatory approvals, manufacturing and commercialization;
- continue to build and maintain a strong intellectual property portfolio;
- recruit and retain qualified executive management and other personnel;

- build and maintain appropriate research and development, clinical, sales, manufacturing, financial reporting, distribution and marketing capabilities on our own or through third parties;
- expand potential indications of NeoCart and our regenerative medicine platform;
- gain broad market acceptance for our product candidates; and
- develop and maintain successful strategic relationships.

If we are unsuccessful in accomplishing any of these objectives, we may not be able to develop product candidates, raise capital, expand our business or continue our operations.

If we encounter difficulties enrolling patients in our clinical trials, including our NeoCart Phase 3 clinical trial, our clinical development activities could be delayed or otherwise adversely affected.

We are required to identify and enroll a sufficient number of patients that meet inclusion criteria under investigation for NeoCart. We will need to enroll the remaining patients in a timely manner in order to complete the trial. There is a limited patient population from which to draw participants in clinical trials. Due to the need to find patients with few or no concomitant joint disease, we may not be able to identify and enroll a sufficient number of patients, or those with required or desired characteristics and criteria, in a timely manner. In addition, there are a limited number of specialized orthopedic surgeons that perform cartilage repair implantation procedures and among physicians who perform such procedures, some may not choose to perform these procedures under conditions that fall within our protocols, which would have an adverse effect on our development of NeoCart. For example, in November 2015 we changed our guidance for the completion of patient enrollment in the NeoCart Phase 3 clinical trial from June 2016 to June 2017 based on enrollment trends in November 2015 not meeting our expectations. Our ability to enroll patients in our clinical trials is affected by a number of factors including:

- the size and nature of the patient population;
- the design of the trial protocol for our NeoCart Phase 3 clinical trial;
- the eligibility and exclusion criteria for the trial in question;
- the availability of competing therapies and competing clinical trials, and physician and patient perception of NeoCart and our other product candidates being studied in relation to these other potential options;
- the efforts to facilitate timely enrollment in our NeoCart Phase 3 clinical trial;
- the ability to identify, and recruit a sufficient number of patients;
- the ability to obtain and maintain patient consent;
- the number and location of clinical sites in our NeoCart Phase 3 clinical trial;
- the proximity and availability of clinical trial sites for prospective patients;
- the availability of time and resources at the institutions where clinical trials are and will be conducted;
- the availability of raw materials and the possibility of raw materials expiring prior to their use;
- the availability of adequate financing to fund ongoing clinical trial expenses;
- the presence of concomitant joint disease in patients under investigation; and
- the study endpoints such as pain that rely on subjective patient reported outcomes.

If we have difficulty enrolling a sufficient number of patients to conduct our clinical trials as planned, we may need to delay or terminate ongoing or planned clinical trials, either of which would have an adverse effect on our business.

A number of companies in the regenerative medicine industry have suffered significant setbacks or difficulty enrolling patients in later stage clinical trials even after achieving promising results in earlier stages of development. Success in preclinical testing and early clinical trials does not ensure that later clinical trials will be successful, and initial results from a clinical trial do not necessarily predict final results. Even if early stage clinical trials are successful, we may need to conduct additional clinical trials for product candidates in additional patient populations or under different treatment conditions before we are able to seek approvals from the FDA and regulatory authorities outside the United States to market and sell these product candidates. Our failure to demonstrate the required characteristics to support marketing approval for NeoCart and our product candidates in our current and future clinical trials would substantially harm our business and prospects.

Failure to obtain, or any delay in obtaining, FDA approval regarding the comparability of critical NeoCart raw materials following our technology transfer and manufacturing location transition may have an adverse effect on our business, operating results and prospects.

We are in the process of completing a technology transfer to transition the manufacturing of certain raw materials and components in the NeoCart supply chain from outsourced contract manufacturers to in-house manufacturing facilities. This technology transfer extends to our source collagen and collagen honeycomb scaffold, as well as the three components of the CT3 bioadhesive—methylated collagen, curing component and activated polyethylene glycol.

We have also entered into a supply agreement with Collagen Solutions (UK) Limited (Collagen Solutions) pursuant to which we may oversee the manufacture of additional collagen used in our manufacture of NeoCart. We currently do not anticipate using any collagen produced by Collagen Solutions during our NeoCart Phase 3 clinical trial, but anticipate needing additional supplies of collagen above those we anticipate being able to produce in-house upon commercialization, if ever.

Although we do not anticipate changes to the raw materials, formulations or properties, nor do we anticipate changes to the NeoCart manufacturing process or finished product specifications as a result of the transfer, we are required to demonstrate to the FDA that the raw materials manufactured in our facility, and which may be manufactured under our direction in third party facilities (including, without limitation, facilities operated by Collagen Solutions) are comparable to the raw materials that were manufactured in the previous contract manufacturers' facilities. Demonstrating comparability requires evidence that the product is consistent with that produced for the clinical trial to assure that the technology transfer does not affect safety, identity, purity or efficacy during the expansion from pilot scale to full scale production. For example, in April 2016, the FDA approved our submission which provided equivalence data for the collagen manufactured at our Lexington, Massachusetts facility, meaning that the collagen manufactured at such facility will require no further additional data or actual patient equivalence studies. Similarly, in August 2016, the FDA notified us that it approved our collagen scaffold equivalence strategy, which we previously submitted in May 2016.

In the future, the FDA may determine that such analytical data is not sufficient to prove comparability of the raw materials produced at our in-house manufacturing sites, or the sites of third parties under our direction, to the raw materials sourced from external vendors for earlier clinical trial work, including the NeoCart Phase 3 clinical trial. If this is the case, the FDA may require that we provide additional preclinical or clinical data to provide evidence to support the comparability of the raw materials. The size, scope, length and costs of any new or supplemental clinical trials that may be required by the FDA to provide such data are not known at this time. Failure or delay in obtaining FDA approval of the comparability of our NeoCart raw materials or the FDA requiring us to provide clinical data may result in delays to our current projected timelines and could have an adverse effect on our business, operating results and prospects.

Additionally, our manufacturing sites, or those of third party sites under our direction, may not receive FDA approval to operate at all, resulting in delays while we implement improvements necessary to receive approval

which would lead to delays in the initiation of commercial production. In addition, we could encounter difficulties involving production yields, quality control and quality assurance, as well as shortages of qualified personnel, leading to additional delays.

We are heavily dependent on the success of our lead product candidate NeoCart, which is still under development in a Phase 3 clinical trial. If we are unable to commercialize NeoCart in the future, or experience significant delays due to manufacturing or otherwise in doing so, our business will be materially harmed.

We have invested a significant portion of our time and financial resources in the development of NeoCart, our product candidate in clinical development. We anticipate that in the near term our ability to generate revenues will depend solely on the successful development and commercialization of NeoCart. We may not complete our registration filings in our anticipated time frame. Even after we complete our Biologics License Application (BLA) filing, the FDA may not accept our submission, may request additional information from us, including data from additional clinical trials, and, ultimately, may not grant marketing approval for NeoCart. In addition, the clinical data we have generated to date is susceptible to varying interpretations and many companies that have believed that their products performed satisfactorily in clinical trials have nonetheless failed to obtain FDA approval for their products.

If we are not successful in commercializing NeoCart, or are significantly delayed in doing so, our business will be materially harmed and we may need to curtail or cease operations. Our ability to successfully commercialize NeoCart will depend, among other things, on our ability to:

- complete the enrollment, data analysis and BLA submission for our NeoCart Phase 3 clinical trial;
- successfully monitor patients during and after treatment and minimize the risk that enrolled subjects will drop out of the NeoCart Phase 3 clinical trial before they are evaluated for the primary endpoint;
- successfully complete and produce NeoCart implants for our clinical trials;
- produce, through a validated process, NeoCart in quantities sufficiently large to permit successful commercialization;
- receive marketing approvals from the FDA and similar foreign regulatory authorities;
- build a commercial infrastructure and launch commercial sales of NeoCart;
- maintain adequate capital resources to fund operations through commercialization; and
- secure acceptance of NeoCart in the medical community and with third-party payors.

We have incurred significant losses since our inception and anticipate that we will continue to incur substantial losses for the next several years.

We have incurred net losses in each year since our inception, including net losses of $15.8 million in 2016 and $32.0 million in 2015. As of December 31, 2016 and December 31, 2015 we had an accumulated deficit of $181.8 million and $165.5 million, respectively. We expect to continue to incur substantial losses for the next several years, and we expect these losses to increase as we continue our development of and seek regulatory approval for, NeoCart and our future product candidates. In addition, if we receive regulatory approval to market NeoCart or any of our future product candidates, we will incur additional losses as we scale our manufacturing operations and build an internal sales and marketing organization to commercialize any approved products. In addition, we expect our expenditures to increase as we add infrastructure and personnel to support our expanding operations in connection with the commercialization of NeoCart, if approved. We anticipate that our net losses and accumulated deficit for the next several years will be significant as we conduct our planned operations.

Because of the numerous risks and uncertainties associated with regenerative medicine product development, we are unable to accurately predict the timing or amount of the development and clinical expenses or when, or if we

will be able to achieve, or maintain, profitability. In addition, our expenses could increase if we are required by the FDA or comparable foreign regulatory authorities to perform preclinical or clinical studies or trials in addition to those currently expected, or if there are any delays in completing the technology transfer and manufacturing location transition of our NeoCart raw material manufacturing process or completing our clinical trials or the development of NeoCart or our future product candidates. The amount of our future net losses will depend, in part, on the amount and timing of our expenses, our ability to generate revenue and our ability to raise additional capital. These net losses have had, and will continue to have, an adverse effect on our stockholders' equity and working capital.

We will require substantial additional funding, which may not be available to us on acceptable terms, or at all, and, if not available, may require us to delay, reduce or cease our product development activities and operations.

We are currently advancing our lead product candidate NeoCart through clinical development. Developing regenerative medicine products, including conducting preclinical studies and clinical trials, is expensive. We will require substantial additional capital in order to file a BLA for NeoCart with the FDA, create additional manufacturing capacity for and to commercialize NeoCart and to conduct the research and development and clinical and regulatory activities necessary to bring other product candidates to market. If the FDA or comparable foreign regulatory authorities require that we perform additional preclinical studies or clinical trials at any point or expand or extend our current trials, our expenses would further increase beyond what we currently expect, and the anticipated timing of any future clinical development activities and potential regulatory approvals may be delayed depending upon our allocation of resources and available funding. Raising funds currently or in the then-current economic environment may be difficult and additional funding may not be available on acceptable terms, or at all.

The global economic downturn and market instability has made the business climate more volatile and more costly. These economic conditions, and uncertainty as to the general direction of the macroeconomic environment, are beyond our control and may make any necessary debt or equity financing more difficult, more costly, and more dilutive. Additional funds may not be available when we need them on terms that are acceptable to us, or at all. If adequate funds are not available to us on a timely basis, or on acceptable terms, we may be required to delay, limit, reduce or terminate preclinical studies, clinical trials or other development activities for one or more of our product candidates or delay, limit, reduce or terminate our establishment of sales and marketing capabilities or other activities that may be necessary to commercialize our product candidates.

The amount and timing of our funding requirements will depend on many factors, including:

- the scope, progress, expansion, costs and results of our NeoCart clinical trials;
- the scope, timing and costs of manufacturing NeoCart implants for use in our NeoCart clinical trials;
- the timing of and costs associated with obtaining FDA approval of the comparability of the NeoCart raw materials manufactured in our facilities, or in third party facilities at our direction, with the raw materials that were manufactured by third parties for the use in our NeoCart clinical trials;
- the timing of and costs involved in obtaining NeoCart regulatory approvals;
- market acceptance of NeoCart following the receipt of regulatory approval, if any;
- the resources we devote to marketing and commercializing NeoCart, if approved;
- the scope, progress, expansion and costs of manufacturing NeoCart;
- the costs of maintaining, expanding and protecting our intellectual property portfolio, including potential litigation costs and liabilities associated therewith; and
- our need to implement additional internal systems and infrastructure, including financial and reporting systems, related to our status as a public company and the potential commercialization of NeoCart, if approved.

Many of these factors are outside of our control. Based upon our currently expected level of operating expenditures, we believe that we will be able to fund our operations and sustain currently projected cash needs into the middle of 2018. Our expectations are based on management's current assumptions and clinical development plans, which may prove to be wrong, and we could spend our available financial resources much faster than we currently expect. This period could be shortened if there are any unanticipated increases in spending on development programs or other unanticipated increases in spending related to circumstances outside of our control, including, without limitation, costs associated with litigation or other legal proceedings, hiring of additional consultants and personnel or procurement of additional raw materials. Our existing cash and cash equivalents will not be sufficient to complete a BLA filing for NeoCart or complete any clinical development of any future product candidates that would be necessary to support an application for regulatory approval. Accordingly, we will continue to require substantial additional capital. In order to fund our future needs, we may seek additional funding through equity or debt financings, development partnering arrangements, lines of credit or other sources.

Our fundraising efforts in the future to secure additional financing will divert our management from our day-to-day activities, which may adversely affect our ability to develop and commercialize our product candidates. In addition, we cannot guarantee that future financing will be available in sufficient amounts or on terms acceptable to us, if at all. If we are unable to raise additional capital when required or on acceptable terms, we may be required to significantly delay, reduce or discontinue the development or commercialization of one or more of our product candidates or curtail our operations, which will have an adverse effect on our business, operating results and prospects.

NeoCart and our future product candidates are subject to extensive regulation, compliance with which is costly and time consuming, may cause unanticipated delays or prevent the receipt of the approvals required to commercialize NeoCart and our future product candidates.

The clinical development, manufacturing, labeling, storage, record-keeping, advertising, promotion, import, export, marketing and distribution of NeoCart and our future product candidates are subject to extensive regulation by the FDA in the United States and by comparable authorities in foreign markets. In the United States, we are not permitted to market our product candidates until we receive regulatory approval from the FDA. The process of obtaining regulatory approval is expensive, often takes many years, and can vary substantially based upon the type, complexity, and novelty of the products involved, as well as the target indications. Approval policies or regulations may change and the FDA has substantial discretion in the tissue regeneration approval process, including the ability to delay, limit or deny approval of a product candidate for many reasons. Despite the time and expense invested in clinical development of product candidates, regulatory approval is never guaranteed.

The FDA or comparable foreign regulatory authorities can delay, limit or deny approval of a product candidate for many reasons, including:

- such authorities may disagree with the design or implementation of our current NeoCart Phase 3 clinical trial or any of our future development partners' clinical trials;
- we or any of our future development partners may be unable to demonstrate to the satisfaction of the FDA or other regulatory authorities that a product candidate is safe and effective for any indication;
- such authorities may not accept clinical data from trials which are conducted at clinical facilities or in countries where the standard of care is potentially different from the United States;
- the results of clinical trials may not demonstrate the safety or efficacy required by such authorities for approval;

- we or any of our future development partners may be unable to demonstrate that a product candidate's clinical and other benefits outweigh its safety risks;
- such authorities may disagree with our interpretation of data from preclinical studies or clinical trials or the use of results from studies that served as precursors to our current or future product candidates;
- such authorities may find deficiencies in our manufacturing processes or facilities or those of third-party manufacturers with which we or any of our future development partners contract for clinical and commercial supplies; or
- the approval policies or regulations of such authorities may significantly change in a manner rendering our or any of our future development partners' clinical data insufficient for approval.

With respect to foreign markets, approval procedures vary among countries and, in addition to the risks described above, can involve additional product testing, administrative review periods, and agreements with pricing authorities. In addition, events raising questions about the safety of certain marketed pharmaceuticals or biologics may result in increased cautiousness by the FDA and comparable foreign regulatory authorities in reviewing new tissue regeneration products based on safety, efficacy or other regulatory considerations and may result in significant delays in obtaining regulatory approvals. Any delay in obtaining, or inability to obtain, applicable regulatory approvals would prevent us or any of our future development partners from commercializing our product candidates.

We are subject to a multitude of manufacturing risks, any of which could substantially increase our costs and limit supply of our products.

The process of manufacturing NeoCart is complex, highly regulated and subject to several risks, including:

- The process of manufacturing NeoCart, including the use of autologous cells, is susceptible to product loss due to contamination, equipment failure or improper installation or operation of equipment, or surgeon or laboratory technician error. Even minor deviations from normal manufacturing processes could result in lost NeoCart production runs, product defects and other supply disruptions. If microbial, viral or other contaminations are discovered in our products or in the manufacturing process or facilities in which our products are made, such manufacturing facilities may need to be closed for an extended period of time to investigate and remedy the contamination.
- The manufacturing facilities in which NeoCart is made could be adversely affected by equipment failures, labor shortages, natural disasters, power failures and numerous other factors. For instance, in 2012, we voluntarily suspended manufacturing operations and paused enrollment of the NeoCart Phase 3 clinical trial upon discovery of discrepancies in the testing procedures used to assess one of the raw materials utilized in the manufacture of NeoCart implants and we could be required in the future to suspend manufacturing due to circumstances out of our control.
- We and our contract manufacturers must comply with the current Good Manufacturing Practices (cGMP) regulations and guidelines promulgated by the FDA. We and our contract manufacturers may encounter difficulties in achieving quality control and quality assurance and may experience shortages in qualified personnel. We and our contract manufacturers are subject to inspections by the FDA and comparable agencies in other jurisdictions to confirm compliance with applicable regulatory requirements. Any failure to follow cGMP or other regulatory requirements or delay, interruption or other issues that arise in the manufacture, packaging, storage or shipping of our products as a result of a failure of our facilities or operations, or the facilities or operations of third parties, to comply with regulatory requirements or pass any regulatory authority inspection could significantly impair our ability to develop and commercialize our products, including leading to significant delays in the availability of products for our clinical studies or the termination or hold on a clinical study, or the delay or prevention of a filing or approval of marketing applications for our product candidates. Significant noncompliance could also result in the imposition of sanctions, including fines, injunctions,

civil penalties, failure of regulatory authorities to grant marketing approvals for our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, any of which could damage our reputation. If we are not able to maintain regulatory compliance, we may not be permitted to market our products or may be subject to product recalls, seizures, injunctions, or criminal prosecution.

- Any adverse developments affecting manufacturing operations for our products may result in shipment delays, clinical enrollment delays, inventory shortages, lot failures, product withdrawals or recalls, or other interruptions in the supply of our products. We may also have to take inventory write-offs and incur other charges and expenses for products that fail to meet specifications, undertake costly remediation efforts or seek more costly manufacturing alternatives.

In order to manufacture NeoCart, we operate our own cGMP manufacturing facility in Waltham, Massachusetts for production of NeoCart. In 2015, we completed a facility for our cGMP manufacturing in Lexington, Massachusetts which we plan to further build out to produce key NeoCart raw materials, including the CT3 components, source collagen and collagen scaffold. While we own the manufacturing process, unforeseen issues or outside influences could impact potential supply. For example:

- Our facility in Waltham may not meet FDA cGMP standards during the pre-approval inspection necessary for BLA approval, delaying BLA approval and resulting in added cost to mitigate issues identified during inspection.
- Our Lexington, Massachusetts facility for production of key raw materials may not receive FDA approval to operate, resulting in delays while we implement improvements necessary to receive approval, leading to delays in the initiation of commercial production. We met with the FDA in December 2014 to obtain preliminary feedback and general acceptance of our raw material transition strategy. In April 2016, the FDA approved our production of collagen and the use of collagen in the current NeoCart phase 3 clinical trial and in August 2016, the FDA also approved our collagen scaffold equivalence strategy. Additionally, we have entered into a supply agreement with Collagen Solutions pursuant to which we will oversee the manufacture of additional collagen used in our manufacture of NeoCart. Any raw materials manufactured or handled at facilities operated by Collagen Solutions will similarly need to be approved by the FDA for comparability, and the FDA may delay approval of the new raw material source or require additional studies to show comparability. We currently do not anticipate using any collagen produced by Collagen Solutions during our Phase 3 clinical trial, but anticipate needing additional supplies of collagen above those we anticipate being able to produce in-house upon commercialization, if ever.
- The raw material to be produced at our facilities may not be comparable to the raw materials sourced from external vendors for earlier clinical trial work, including the ongoing NeoCart Phase 3 clinical trial, according to our current projected timelines, and the FDA may delay approval of the new raw material source or require additional studies to show comparability. Such delays may impact enrollment of our NeoCart Phase 3 clinical trial and FDA approval, if granted at all.
- We may not achieve our anticipated production throughput targets, resulting in lower than anticipated capacity, limiting supply of our products, lowering revenue and increasing costs. We may not hit our production cost target for a variety of reasons including increased raw material cost, underestimate of labor requirements, underestimate of capital requirement and other facility, personnel or materials issues that we have not anticipated. Increased costs will adversely impact gross margin achieved by our products.
- We may not be able to fund future expansions of additional clean rooms and associated equipment and validations to support NeoCart production, or the FDA may require additional data that may delay our ability to supply anticipated market needs.

- The FDA may not approve implementation of the multi-unit NeoCart reactor or approval may be delayed, which could result in capacity limitation and high unit costs, depending upon the length of the delay.

NeoCart or any future product candidate we or any of our future development partners advance into clinical trials may cause unacceptable adverse events or have other properties that may delay or prevent its regulatory approval or limit its commercial potential.

Unacceptable adverse events caused by NeoCart or any of our future product candidates that we advance into clinical trials could cause us or regulatory authorities to interrupt, delay or halt clinical trials and could result in the denial of regulatory approval by the FDA or other regulatory authorities for any or all targeted indications and markets. This in turn could prevent us from completing development or commercializing the affected product candidate and generating revenue from its sale.

We have not yet completed clinical testing of any of our product candidates for the treatment of the indications for which we intend to seek approval, and we currently do not know the extent of adverse events, if any, that will be observed in individuals who receive any of our product candidates. If any of our product candidates cause unacceptable adverse events in clinical trials, we may not be able to obtain regulatory approval or commercialize such product candidate.

The results of preclinical studies and early clinical trials are not always predictive of future results. Any product candidate we or any of our future development partners advance into clinical trials may not have favorable results in later clinical trials, if any, or receive regulatory approval.

Regenerative medicine product development has inherent risk. We or any of our future development partners will be required to demonstrate through adequate and well-controlled clinical trials that our product candidates are effective, with a favorable benefit-risk profile, for use in their target indications before we can seek regulatory approvals for their commercial sale. Regenerative medicine product development is a long, expensive and uncertain process, and delay or failure can occur at any stage of development, including after commencement of any of our clinical trials. In addition, success in early clinical trials does not mean that later clinical trials will be successful because product candidates in later-stage clinical trials may fail to demonstrate sufficient safety or efficacy despite having progressed through initial clinical testing. Furthermore, our future trials will need to demonstrate sufficient safety and efficacy for approval by regulatory authorities in larger patient populations. Companies frequently suffer significant setbacks in advanced clinical trials, even after earlier clinical trials have shown promising results. In addition, only a small percentage of biologics under development result in the submission of a BLA to the FDA and even fewer are approved for commercialization.

Development of regenerative medicine products is inherently expensive and risky and may not be understood by or accepted in the marketplace, which could adversely affect our future value.

The clinical development, commercialization and marketing of regenerative medicine products are at an early-stage, substantially research-oriented, and financially speculative. To date, very few companies have been successful in their efforts to develop and commercialize regenerative medicine products. In general, regenerative medicine products may be susceptible to various risks, including undesirable and unintended side effects, unintended immune system responses, inadequate therapeutic efficacy, potentially prohibitive costs or other characteristics that may prevent or limit their approval or commercial use. Furthermore, the number of people who may use cell- or tissue-based regenerative medicine therapies is difficult to forecast with accuracy. Our future success is dependent on the establishment of a large global market for regenerative medicine products and our ability to capture a share of this market with NeoCart and our future product candidates.

Our development efforts with our regenerative medicine platform are susceptible to the same risks of failure inherent in the development and commercialization of product candidates based on new technologies. The novel

nature of regenerative medicine products creates significant challenges in the areas of product development and optimization, manufacturing, government regulation, third-party reimbursement and market acceptance.

Even if we successfully develop and obtain regulatory approval for NeoCart and our future product candidates, the market may not understand or accept them. NeoCart and our future product candidates represent novel treatments and are expected to compete with a number of surgical options and more conventional products and therapies manufactured and marketed by others, including major pharmaceutical and biotechnology companies. The degree of market acceptance of any of our developed and potential product candidates will depend on a number of factors, including:

- the clinical safety and effectiveness of NeoCart and our future product candidates and their perceived advantage over alternative treatment methods, if any;
- the design of the trial protocol for our NeoCart Phase 3 clinical trial;
- adverse events involving NeoCart and our future product candidates or the products or product candidates of others;
- the performance of competitive products in the market; and
- the cost of manufacturing our products, the selling price of our products, and the reimbursement policies of government and private third-party payors.

If the healthcare community does not accept NeoCart or our future product candidates for any of the foregoing reasons, or for any other reason, it could affect our sales, having an adverse effect on our business, financial condition and results of operations.

We have a limited manufacturing capacity for NeoCart and our future product candidates, which could inhibit our revenues and the long-term growth prospects of our business.

We currently produce materials for clinical trials, including production of NeoCart, at our existing manufacturing facilities in Waltham, Massachusetts, which we have designed and operated to be compliant with FDA, cGMP and the current Good Tissue Practice as and if applicable, requirements. While we believe these facilities provide us with sufficient capacity to meet our expected clinical demand and possibly our initial commercial launch demand, it is possible that the demand for products could exceed our existing manufacturing capacity. It will become necessary or desirable for us to expand our manufacturing capabilities for our regenerative medicine platform in the future, which may require us to invest significant amounts of capital and to obtain regulatory approvals. If we are unable to meet rising demand for products on a timely basis or unable to maintain cGMP compliance standards, then it is likely that our clients and potential clients will elect to obtain the products from competitors, which could materially and adversely affect the level of our revenues and our prospects for growth.

The current tissue engineering processor (TEP) in our Waltham facility is resource dependent due to the single-unit capacity. We are developing a multi-unit NeoCart reactor design which we believe would alleviate the capacity restraints currently resulting from our single-unit processors. We may begin implementation of a multi-reactor unit during the first year of product commercialization, thus providing adequate capacity to meet expected demand through the first two years of commercialization from our internal facilities. The FDA may not, however, approve implementation of the multi-unit NeoCart reactor or approval may be delayed which could result in capacity limitation or high unit costs depending upon the length of the delay.

We may not be able to fund future expansions of additional clean rooms and associated equipment and validations to support NeoCart production, or the FDA may require additional data that may delay our ability to supply anticipated market needs.

Components of regenerative medicine products approved for commercial sale or used in late-stage clinical trials must be manufactured in accordance with cGMP. In addition, the manufacturing process of regenerative

medicine products may be required to be modified from time to time in response to FDA requests. Manufacture of cell- or tissue-based regenerative medicine products is complex and subjects companies to significant regulatory burdens that may change over time. We may encounter difficulties in the production of our product candidates due to our limited manufacturing experience.

Significant developments arising from the United States presidential election or the U.K.s referendum on membership in the EU could have a material adverse effect on us.

In January of 2017, a new presidential administration and Congress took power in the United States. The new president has expressed antipathy towards existing trade agreements, like the North American Free Trade Agreement, greater restrictions on free trade generally and significant increases on tariffs on goods imported into the United States, particularly from China and Mexico. Changes in United States social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment, and any negative sentiments towards the United States as a result of such changes, could adversely affect our business.

Additionally, the new presidential administration and Congress have indicated that they will repeal and replace the Patient Protection and Affordable Care Act, as amended by the Health Care and Education Affordability Reconciliation Act of 2010 (the ACA) and the president, in January of 2017, signed an executive order that mandated that all executive agencies to the maximum extent of the law waive, defer, grant exemptions from, or delay implementation of any provision or requirement of the ACA. The provisions of the ACA became effective beginning in 2010, although the new presidential administration and Congress is actively working to repeal it and replace it with a different health care law. While we cannot predict what impact on federal reimbursement policies this law or any replacement law will have in general or specifically on any product we may commercialize in the future, the ACA or any replacement may result in downward pressure on reimbursement, which could negatively affect market acceptance of new products. Any rebates, discounts, taxes costs or regulatory or systematic changes on healthcare resulting from the ACA or its replacement may have a significant effect on our profitability in the future. We cannot predict whether the ACA will continue or what other laws or proposals will be made or adopted, or what impact these efforts may have on us.

On June 23, 2016, the United Kingdom held a referendum and voted in favor of leaving the European Union. On February 1, 2017, the United Kingdom parliament voted to allow the United Kingdom to exit the European Union by passing a bill that gives the prime minister of the United Kingdom the authority to invoke Article 50 of the Lisbon Treaty. This referendum has created political and economic uncertainty, particularly in the United Kingdom and the European Union, and this uncertainty may last for years. There are many ways in which our business could be affected, only some of which we can identify.

The referendum, and the likely withdrawal of the United Kingdom from the European it triggers, has caused and, along with events that could occur in the future as a consequence of the United Kingdom’s withdrawal, including the possible breakup of the United Kingdom, may continue to cause significant volatility in global financial markets, including in global currency and debt markets. This volatility could cause a slowdown in economic activity in the United Kingdom, Europe or globally, which could adversely affect our operating results and growth prospects. In addition, our business could be negatively affected by new trade agreements between the United Kingdom and other countries, including the United States, and by the possible imposition of trade or other regulatory barriers in the United Kingdom. These possible negative impacts, and others resulting from the United Kingdom’s actual or threatened withdrawal from the European Union, may adversely affect our operating results and growth prospects.

Changes in government funding for the FDA and other government agencies could hinder their ability to hire and retain key leadership and other personnel, properly administer drug innovation, or prevent new products

and services from being developed or commercialized by our life science tenants, which could negatively impact our business.

The ability of the FDA to review and approve new products can be affected by a variety of factors, including budget and funding levels, ability to hire and retain key personnel, and statutory, regulatory, and policy changes. Average review times at the agency have fluctuated in recent years as a result. In addition, government funding of other government agencies that fund research and development activities is subject to the political process, which is inherently fluid and unpredictable.

The ability of the FDA and other government agencies to properly administer their functions is highly dependent on the levels of government funding and the ability to fill key leadership appointments, among various factors. Currently, the FDA Commissioner position is vacant, pending the appointment of a new Commissioner by the new presidential administration. The confirmation process for a new commissioner may not occur efficiently. Delays in filling or replacing key positions could significantly impact the ability of the FDA and other agencies to fulfill their functions and could greatly impact healthcare and the biologics industry.

In December 2016, the 21st Century Cures Act was signed into law. This new legislation is designed to advance medical innovation and empower the FDA with the authority to directly hire positions related to drug and device development and review. In the past, the FDA was often unable to offer key leadership candidates (including scientists) competitive compensation packages as compared to those offered by private industry. The 21st Century Cures Act is designed to streamline the agency's hiring process and enable the FDA to compete for leadership talent by expanding the narrow ranges that are provided in the existing compensation structures.

In the first week of the new presidential administration, it issued executive orders to freeze government hiring of new employees with the exception of military, national security and public safety personnel. This hiring freeze could impede current or future operations at the FDA and other agencies. It is unknown at this time what the impact of the hiring freeze will have on the FDA and on programs such as the 21st Century Cures Act. Furthermore, future government proposals to reduce or eliminate budgetary deficits may include reduced allocations to the FDA and other related government agencies. These budgetary pressures may result in a reduced ability by the FDA to perform their respective roles; including the related impact to academic institutions and research laboratories whose funding is fully or partially dependent on both the level and timing of funding from government sources.

Disruptions at the FDA and other agencies may also slow the time necessary for new drugs, biologics and devices to be reviewed and/or approved by necessary government agencies and the healthcare and drug industries' ability to deliver new products to the market in a timely manner, which would adversely affect our tenants' operating results and business. Interruptions to the function of the FDA and other government agencies could adversely affect the demand for office/laboratory space and significantly impact our operating results and our business.

If our competitors develop treatments for the target indications of NeoCart or our future product candidates that are approved more quickly, marketed more successfully or demonstrated to be safer or more effective than our product candidates, our commercial opportunity will be reduced or eliminated.

The regenerative medicine industry is intensely competitive and subject to rapid and significant technological change. We face competition from major multinational companies, established and early-stage biotechnology companies, and universities and other research institutions. Many of our competitors have greater financial and other resources, such as larger research and development staff and more experienced marketing and manufacturing organizations. Large pharmaceutical companies, in particular, have extensive experience in clinical testing, obtaining regulatory approvals, recruiting patients and manufacturing products. These companies also have significantly greater research, sales and marketing capabilities and collaborative arrangements in our target markets with leading companies and research institutions. Established companies may also invest heavily to accelerate discovery and development of novel therapeutics or to in-license novel therapeutics that could make

the product candidates that we develop obsolete. As a result of all of these factors, our competitors may succeed in obtaining patent protection or FDA approval or discovering, developing and commercializing treatments in the regenerative medicine indications that we are targeting before we do. Smaller or early-stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large, established companies.

There are several clinical-stage development programs in various stages of development that seek to regenerate soft tissue and repair cartilage. Our competitors may succeed in developing, acquiring or licensing on an exclusive basis, technologies and products that are more effective, including a one-step alternative to NeoCart, or less costly than NeoCart or any future product candidates that we may develop, which could render our products obsolete and noncompetitive.

We believe that our ability to successfully compete will depend on, among other things:

- the results of our and our collaborative partners' preclinical studies and clinical trials;
- the relative prices and perceived value of competitive products as compared to NeoCart;
- our ability to recruit and enroll patients for our clinical trials;
- the relative efficacy, safety, ease of use, reliability and durability of our product candidates;
- the speed at which we and our competitors develop our respective product candidates;
- our ability to design and successfully execute appropriate clinical trials;
- our ability to manufacture raw materials for use in our clinical trials, including our Phase 3 clinical trial of NeoCart;
- our ability to protect and develop intellectual property rights related to our products;
- our ability to maintain a good relationship with regulatory authorities;
- the timing and scope of regulatory approvals, if any;
- our ability to commercialize and market any of our product candidates that receive regulatory approval;
- market perception and acceptance of regenerative medicine products;
- acceptance of our product candidates by physicians, patients and institutions;
- the cost to manufacture and price of our products;
- adequate levels of reimbursement under private and governmental health insurance plans, including Medicare; and
- our ability to manufacture and sell commercial quantities of any approved products to the market.

If our competitors market products that are more effective, safer or less expensive than our future products or that reach the market sooner than our future products, we may not achieve commercial success. In addition, poor market reception to the recently launched MACI product by a competitor could negatively impact the future launch of NeoCart. Any inability to compete effectively will adversely impact our business and financial prospects.

If we are not successful in discovering, developing, acquiring and commercializing additional product candidates, our ability to expand our business will be limited.

A substantial amount of our effort is focused on the continued clinical testing and potential approval of NeoCart and our future product candidates and expanding our product candidates to serve other indications of high unmet medical needs. Research programs to identify other indications require substantial technical, financial and human resources, whether or not any product candidates for other indications are ultimately identified. Our research programs may initially show promise in identifying potential product candidates, yet fail to yield product candidates for clinical development for many reasons, including the following:

- the research methodology used may not be successful in identifying potential product candidates;
- competitors may develop alternatives that render our product candidates obsolete or less attractive;
- product candidates we develop may nevertheless be covered by third parties' patents or other exclusive rights;
- a product candidate may on further study be shown to have harmful side effects or other characteristics that indicate it is unlikely to be effective or otherwise does not meet applicable regulatory criteria;
- a product candidate may not be capable of being produced in commercial quantities at an acceptable cost, or at all; and
- a product candidate may not be accepted as safe and effective by patients, the medical community or third-party payors, if applicable.

If we do not successfully develop and commercialize product candidates for other indications, our business and future prospects may be limited and our business will be more vulnerable to problems that we encounter in developing and commercializing our current product candidates.

We may fail to comply with any of our obligations under existing agreements pursuant to which we license rights or technology, which could result in the loss of rights or technology that are material to our business.

We are a party to technology licenses that are important to our business and we may enter into additional licenses in the future. We currently hold material licenses from Purpose Co., Ltd., Angiotech Pharmaceuticals (US), Inc., Angiodevice International GmbH, the Board of Trustees of The Leland Stanford Junior University, Koken Co., Ltd., Intrexon and Advanced BioMatrix, Inc. The rights licensed under these agreements, including rights relating to our scaffolds, tissue processor, bioadhesives and growth factors, are material to our regenerative medicine platform and the continued development of NeoCart and our future product candidates. These licenses impose various commercial, contingent payment, royalty, insurance, indemnification and other obligations on us. If we fail to comply with these obligations, the licensor may have the right to terminate the license, in which event we would lose valuable rights under our license agreements and our ability to develop or commercialize product candidates. Any termination or reversion of our rights to under the foregoing agreements may have a material adverse effect on our business, prospects and results of operations. Our Exclusive Channel Collaboration Agreement (the ECC) with Intrexon Corporation (Intrexon) provides that Intrexon may terminate such agreement if we do not perform certain specified requirements, including developing therapies considered demonstrably superior to existing therapies and those under development by us.

The technologies on which our channel partnering agreement with Intrexon is based are currently in preclinical and clinical stages of development. The intellectual property of Intrexon underlying the ECC may be subject to infringement or other challenges, similar to those we face, as set forth elsewhere in these risk factors.

Our ECC with Intrexon that provides for the worldwide exclusive use of Intrexon's proprietary synthetic biology technology platform for the development and commercialization of allogeneic genetically modified chondrocyte cell therapeutics for the treatment or repair of damaged articular hyaline cartilage in humans. Such technologies have a limited history of use in the design and development of human therapeutic product candidates and may therefore involve unanticipated risks or delays. We cannot assure that any product candidates developed from this collaboration will result in nonclinical results sufficient to warrant the advancement of such product candidates into human clinical trials.

To the extent the intellectual property protection of any of the assets owned or licensed by Intrexon utilized under our ECC with Intrexon are successfully challenged or encounter problems, including, without limitation, restrictions on freedom to operate, with the United States Patent and Trademark Office or other comparable agencies throughout the world, the future development or commercialization, if any, of these potential products

could be delayed or prevented. Any challenge to the intellectual property protection of intellectual property owned or licensed by Intrexon of a potential development asset arising from our ECC with Intrexon could harm our business have an adverse effect on our financial condition and results of operations.

We will incur additional expenses in connection with our exclusive channel collaboration arrangement with Intrexon.

Pursuant to our ECC with Intrexon, we are responsible for future research and development expenses of product candidates developed under each such collaboration, the effect of which may increase the level of our overall research and development expenses going forward. We have incurred $3.0 million and $3.1 million for the years ended December 31, 2016 and 2015, respectively, in connection with our collaboration with Intrexon. In addition, because development activities are determined pursuant to a joint steering committee comprised of representatives of Intrexon and us, future development costs associated this program may be difficult to anticipate and may exceed our expectations. Our actual cash requirements may vary materially from our current expectations for a number of other factors that may include, but are not limited to, unanticipated technical challenges, changes in the focus and direction of our development activities or adjustments necessitated by changes in the competitive landscape in which we operate. If we are unable to continue to financially support such collaborations due to our own working capital constraints, we may be forced to delay our activities.

We may experience delays in commencing or conducting our clinical trials or in receiving data from third parties or in the completion of clinical testing, which could result in increased costs to us and delay our ability to generate product candidate revenue.

Before we can initiate clinical trials in the United States for our product candidates, we need to submit the results of preclinical testing to the FDA as part of an IND application, along with other information including information about product candidate chemistry, manufacturing and controls and our proposed clinical trial protocol. We may rely in part on preclinical, clinical and quality data generated by contract research organization and other third parties for regulatory submissions for our product candidates. If these third parties do not make timely regulatory submissions for our product candidates, it will delay our plans for our clinical trials. If those third parties do not make this data available to us, we will likely have to develop all necessary preclinical and clinical data on our own, which will lead to significant delays and increase development costs of the product candidate. In addition, the FDA may require us to conduct additional preclinical testing for any product candidate before it allows us to initiate clinical testing under any IND application, which may lead to additional delays and increase the costs of our preclinical development. Despite the presence of an active IND application for a product candidate, clinical trials can be delayed for a variety of reasons including delays in:

- identifying, recruiting and training suitable clinical investigators;
- reaching agreement on acceptable terms with prospective contract research organizations and trial sites, the terms of which can be subject to extensive negotiation, may be subject to modification from time to time, and may vary significantly among different contract research organizations and trial sites;
- manufacturing and obtaining sufficient quantities of a product candidate for use in clinical trials, including as a result of transferring the manufacturing of a product candidate to another site or manufacturer or the procurement of critical raw materials required for manufacturing a product candidate;
- obtaining and maintaining institutional review board or ethics committee approval to conduct a clinical trial at an existing or prospective site;
- identifying, recruiting and enrolling subjects to participate in a clinical trial; and
- retaining or replacing participants who have initiated a clinical trial but may withdraw due to adverse events from the therapy, insufficient efficacy, fatigue with the clinical trial process, or personal issues.

The FDA may also put a clinical trial on clinical hold at any time during product candidate development. In addition, we may voluntarily pause a clinical trial for a variety of reasons. For instance, in 2012 we voluntarily suspended manufacturing operations and paused enrollment of the NeoCart Phase 3 clinical trial upon discovery of discrepancies in the testing procedures used to assess one of the raw materials utilized in the manufacture of NeoCart implants and we could be required in the future to suspend manufacturing due to circumstances out of our control.

Once a clinical trial has begun, it may also be delayed as a result of ambiguous or negative interim results. Further, a clinical trial may be suspended or terminated by us, an institutional review board, an ethics committee or a data safety monitoring committee overseeing the clinical trial, any of our clinical trial sites with respect to that site or the FDA or other regulatory authorities 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 clinical trial site by the FDA or other regulatory authorities;
- unforeseen safety issues, known safety issues that occur at a greater frequency or severity than we anticipate, or any determination that the clinical trial presents unacceptable health risks; or
- lack of adequate funding to continue the clinical trial.

Any delays in the commencement of our clinical trials will delay our ability to pursue regulatory approval for our product candidates. Changes in U.S. and foreign regulatory requirements and guidance also may occur and we may need to amend clinical trial protocols to reflect these changes. Amendments may require us to resubmit our clinical trial protocols to institutional review boards for re-examination, which may affect the costs, timing and likelihood of a successful completion of a clinical trial. If we or any of our future development partners experience delays in the completion of, or if we or any of our future development partners must terminate, any clinical trial of any product candidate our ability to obtain regulatory approval for that product candidate will be delayed and the commercial prospects, if any, for the product candidate may suffer as a result. In addition, many of these factors may also ultimately lead to the denial of regulatory approval of a product candidate.

Regulatory authorities, including the FDA, PMDA and the European Medicines Agency, may disagree with our interpretations of data from pre-clinical studies and clinical trials. Regulatory authorities also may approve a product for narrower indications than requested or may grant approval subject to the performance of post-marketing studies for a product. There can be no guarantee that such post-approval studies, if required, will corroborate the results of earlier trials. Furthermore, the market use of such products may show different safety and efficacy profiles to those demonstrated in the trials on which marketing approval was based. Such circumstances could lead to the withdrawal or suspension of marketing approval for the product, which could have a material adverse effect on our business, financial condition, operating results or cash flows. In addition, regulatory authorities may not approve or agree with the labeling claims that are necessary or desirable for the successful commercialization of our products.

If NeoCart or any future product candidate that we successfully develop does not achieve broad market acceptance among physicians, patients, healthcare payors and the medical community, the revenue that it generates may be limited.

Even if NeoCart or our future product candidates receive regulatory approval, they may not gain market acceptance among physicians, patients, healthcare payors and the medical community. Coverage and reimbursement of our product candidates by third-party payors, including government payors, generally is also necessary for commercial success. The degree of market acceptance of any approved product candidates will depend on a number of factors, including:

- the efficacy and safety as demonstrated in clinical trials;
- the clinical indications for which our product candidate is approved;

- acceptance by physicians, major operators of hospitals and clinics and patients of our product candidate as a safe and effective treatment;
- the number of alternative treatments on the market and the potential and perceived advantages of our product candidates over such alternative treatments;
- the safety of product candidates seen in a broader patient group, including their use outside the approved indications;
- the cost of treatment in relation to alternative treatments;
- the availability of adequate reimbursement and pricing by third parties and government authorities;
- relative convenience and ease of administration;
- the prevalence and severity of adverse events;
- the effectiveness of our sales and marketing efforts; and
- unfavorable publicity relating to the product candidate or regenerative medicine products, in general.

If any product candidate is approved but does not achieve an adequate level of acceptance by physicians, hospitals, healthcare payors and patients, we may not generate sufficient revenue from that product candidate and may not become or remain profitable. Ethical, social and legal concerns about regenerative medicine products could result in additional regulations restricting or prohibiting the use of our product candidates.

Additionally, if any of our competitors' products are approved and are unable to gain market acceptance for any reason, there could be a market perception that products like NeoCart are not able to adequately meet an unmet medical need. If we are unable to demonstrate to physicians, hospitals, healthcare payors and patients that our products are better alternatives, we may not be able to gain market acceptance for our products at the levels we anticipate and our business may be materially harmed as a result.

Insurance coverage and reimbursement may be limited or unavailable in certain market segments for our product candidates, which could make it difficult for us to sell our product candidates profitably.

Market acceptance and sales of NeoCart and our future product candidates will depend significantly on the availability of adequate insurance coverage and reimbursement from third-party payors for any of our product candidates and may be affected by existing and future health care reform measures. Government authorities and third-party payors, such as private health insurers and health maintenance organizations, decide which medical treatments they will pay for and establish reimbursement levels. 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 candidate 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.

Obtaining coverage and reimbursement approval for a product candidate from a government or other third-party payor is a time-consuming and costly process that could require us to provide supporting scientific, clinical and cost effectiveness data for the use of our product candidates to the payor. We may not be able to provide data sufficient to gain acceptance with respect to coverage and reimbursement. We cannot be sure that coverage or adequate reimbursement will be available for any of our product candidates. Also, we cannot be sure that reimbursement amounts will not reduce the demand for, or the price of, NeoCart or our future product candidates. If reimbursement is not available or is available only to limited levels, we may not be able to commercialize certain of our product candidates profitably, or at all, even if approved.

In the United States and certain foreign jurisdictions, there have been a number of legislative and regulatory changes to health care systems that could affect our ability to sell our product candidates profitably. In particular, in 2003 the Medicare Modernization Act revised the payment methods for many product candidates under Medicare. This has resulted in lower rates of reimbursement. There have been numerous other federal and state initiatives designed to reduce payment for products.

As a result of legislative proposals and the trend toward managed health care in the United States, third-party payors are increasingly attempting to contain healthcare costs by limiting both coverage and the level of reimbursement of new tissue regenerative medicine products. They may also refuse to provide coverage of approved product candidates for medical indications other than those for which the FDA has granted market approvals. As a result, significant uncertainty exists as to whether and how much third-party payors will reimburse patients for their use of newly approved regenerative medicine products, which in turn will put pressure on the pricing of such products. We expect to experience pricing pressures in connection with the sale of our product candidates due to the trend toward managed health care, the increasing influence of health maintenance organizations, and additional legislative proposals as well as country, regional, or local healthcare budget limitations.

In addition, reimbursement agencies in foreign jurisdictions may be more conservative than those in the United States. Accordingly, in markets outside the United States, the reimbursement for our products may be more limited than in the United States and may be insufficient to generate commercially reasonable revenues and profits.

Failure to obtain or maintain adequate reimbursement for any products for which we receive marketing approval will adversely impact our ability to achieve commercial success. See also the risk factor entitled “Significant developments arising from the United States presidential election or the U.K.s referendum on membership in the EU could have a material adverse effect on us” located elsewhere in these risk factors for further risks associated with reimbursement.

We may face product liability claims and, if successful claims are brought against us, we may incur substantial liability and costs. If the use of our product candidates harms patients, or is perceived to harm patients even when such harm is unrelated to our product candidates, our regulatory approvals could be revoked or otherwise negatively impacted and we could be subject to costly and damaging product liability claims.

The use of NeoCart and our future product candidates in clinical trials and the sale of any products for which we obtain marketing approval exposes us to the risk of product liability claims. Product liability claims might be brought against us by participants in clinical trials, consumers, healthcare providers, pharmaceutical companies or others selling or otherwise coming into contact with our product candidates and any products for which we obtain marketing approval. There is a risk that our product candidates may induce adverse events, and that such adverse events may not be detected for a long period of time. If we cannot successfully defend against product liability claims, we could incur substantial liability and costs. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- impairment of our business reputation;
- withdrawal of clinical trial participants;
- termination of clinical trial sites or entire trial programs;
- increased costs due to related litigation;
- distraction of management’s attention from our primary business;
- substantial monetary awards to patients or other claimants;
- the inability to commercialize our product candidates; and
- decreased demand for our product candidates, if approved for commercial sale.

We carry product liability insurance that we believe is sufficient in light of our current clinical programs; however, we may not be able to maintain insurance coverage at a reasonable cost or in sufficient amounts to protect us against losses due to liability. If and when we obtain marketing approval for product candidates, we intend to expand our insurance coverage to include the sale of commercial products; however, we may be unable to obtain product liability insurance on commercially reasonable terms or in adequate amounts. On occasion, large judgments have been awarded in class action lawsuits based on regenerative medicine products or medical treatments that had unanticipated adverse effects. In addition, under some of our agreements with clinical trial sites, we are required to indemnify the sites and their personnel against product liability and other claims. A successful product liability claim or series of claims brought against us or any third parties whom we are required to indemnify could cause our stock price to decline and, if judgments exceed our insurance coverage, could adversely affect our results of operations and business.

During the course of treatment, patients may suffer adverse events for reasons that may be related to our product candidates. Such events could subject us to costly litigation, require us to pay substantial amounts of money to injured patients, delay, negatively impact or end our opportunity to receive or maintain regulatory approval to market our products, or require us to suspend or abandon our commercialization efforts. Even in a circumstance in which we do not believe that an adverse event is related to our products, the investigation into the circumstance may be time-consuming or inconclusive. These investigations may interrupt our development and commercialization efforts, delay our regulatory approval process, or impact and limit the type of regulatory approvals our product candidates receive or maintain. As a result of these factors, a product liability claim, even if successfully defended, could have a material adverse effect on our business, financial condition or results of operations.

We do not carry insurance for all categories of risk that our business may encounter and we may not be able to maintain insurance with adequate levels of coverage. Any significant uninsured liability may require us to pay substantial amounts, which would adversely affect our financial position and results of operations.

If we are unable to establish sales and marketing capabilities or fail to enter into agreements with third parties to market and sell any product candidates we may successfully develop, we may not be able to effectively market and sell any such product candidates.

We have no experience selling and marketing any products. We do not currently have any infrastructure for the sale, marketing and distribution of any of our product candidates once approved, if at all, and we must build this infrastructure in order to commercialize any product candidates for which we may obtain approval in the United States or make arrangements with third parties to perform these functions for us outside of the United States. To successfully commercialize any products that may result from our development programs, we will need to develop these capabilities, either on our own or with others. The establishment and development of a sales force, either by us or jointly with a development partner, or the establishment of a contract sales force to market any product candidates we may develop will be expensive and time consuming and could delay any commercial launch. If we or any of our future development partners are unable to establish sales and marketing capabilities or any other nontechnical capabilities necessary to commercialize any product candidates we may successfully develop, we will need to contract with third parties to market and sell such product candidates. We may not be able to establish arrangements with third parties on acceptable terms, if at all.

Legislative or regulatory healthcare reforms in the United States and abroad may make it more difficult and costly for us to obtain regulatory approval of our product candidates and to produce, market and distribute our products after approval is obtained.

From time to time, legislation is drafted and introduced in Congress that could significantly change the statutory provisions governing the regulatory approval, manufacture and marketing of regulated products or the reimbursement thereof. In addition, FDA regulations and guidance are often revised or reinterpreted by the FDA in ways that may significantly affect our business and our products. Any new regulations or revisions or

reinterpretations of existing regulations may impose additional costs or lengthen review times of NeoCart or any future product candidates. We cannot determine what effect changes in regulations, statutes, legal interpretation or policies, when and if promulgated, enacted or adopted may have on our business in the future. Such changes could, among other things, require:

- changes to manufacturing methods;
- additional studies, including clinical studies;
- recall, replacement, or discontinuance of one or more of our products;
- the payment of additional taxes; or
- additional record keeping.

Each of these requirements would likely entail substantial time and cost and could adversely harm our business and our financial results. In addition, delays in receipt of or failure to receive regulatory approvals for any future products would harm our business, financial condition and results of operations. We intend to seek approval to market our product candidates in both the United States and in foreign jurisdictions. If we obtain approval in one or more foreign jurisdictions, we will be subject to rules and regulations in those jurisdictions relating to such product candidate. If reimbursement of our future products is unavailable or limited in scope or amount, or if pricing is set at unsatisfactory levels, we may be unable to achieve or sustain profitability.

We currently rely on third parties in order to perform certain aspects of our business, including to support certain aspects of our clinical trials and to supply the NeoCart tissue engineering processor. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, we may not be able to obtain regulatory approval for or commercialize our product candidates and our business could be substantially harmed.

We have relied upon and plan to continue to rely upon third parties to monitor and manage data for our ongoing clinical programs. We rely on these parties for execution of our clinical trials, and control only certain aspects of their activities. Nevertheless, we are responsible for ensuring that each of our studies is conducted in accordance with the applicable protocol and legal, regulatory and scientific standards, and our reliance on third parties does not relieve us of our regulatory responsibilities. We also rely on third parties to assist in conducting our nonclinical studies in accordance with good laboratory practices. We and our third-party service providers are required to comply with good clinical practices, which are regulations and guidelines enforced by the FDA, as well as comparable foreign regulations and guidelines, for all of our product candidates in clinical development. Regulatory authorities enforce these good clinical practices through periodic inspections of trial sponsors, principal investigators and trial sites. If we or any of our third-party service providers or clinical trial sites fail to comply with applicable good clinical practices, 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 by a given regulatory authority, such regulatory authority will determine that any of our clinical trials comply with good clinical practices requirements. In addition, our clinical trials must be conducted with product produced under applicable good manufacturing practices requirements. Failure to comply with these regulations may require us to repeat nonclinical and clinical trials, which would delay the regulatory approval process.

Our third-party service providers are not our employees, and except for remedies available to us under our agreements with such third parties, we cannot control whether or not they devote sufficient time and resources to our on-going clinical and nonclinical programs. If third-party service providers do not successfully carry out their contractual duties or obligations or meet expected deadlines 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, our clinical trials may be extended, delayed or terminated and we may not be able to obtain regulatory approval for or successfully commercialize our product candidates. As a result, our results of operations and the commercial prospects for our product candidates would be harmed, our costs could increase and our ability to generate revenues could be delayed.

Because we have relied on third parties, our internal capacity to perform these functions is limited. Outsourcing these functions involves risk that third parties may not perform to our standards, may not produce results in a timely manner or may fail to perform at all. In addition, the use of third-party service providers requires us to disclose our proprietary information to these parties, which could increase the risk that this information will be misappropriated. We currently have a small number of employees, which limits the internal resources we have available to identify and monitor our third-party service providers. To the extent we are unable to identify and successfully manage the performance of third-party service providers in the future, our business may be adversely affected. Although we carefully manage our relationships with our third-party service providers, there can be no assurance that we will not encounter similar challenges or delays in the future or that these delays or challenges will not have a material adverse impact on our business, financial condition and prospects.

We are also dependent on third-party suppliers, most of which are sole source suppliers of the components used to manufacture our TEP. If these third-party suppliers do not supply sufficient quantities to us on a timely basis and in accordance with applicable specifications and other regulatory requirements, there could be a significant interruption of our ability to supply, which would adversely affect clinical development or commercial production of the product candidate. Furthermore, if any of these third parties cannot successfully supply TEPs that we require for our production that conforms to our specifications and with regulatory requirements, we will not be able to meet demand, for our product candidates.

We do not expect to have the resources or capacity to commercially manufacture TEPs required to manufacture our proposed product candidates if approved, and will likely continue to be dependent on third-party suppliers. Our dependence on third parties to manufacture and supply us with these TEPs may adversely affect our ability to develop and commercialize our product candidates on a timely basis.

We have also entered into a supply agreement with Collagen Solutions pursuant to which we may oversee the manufacture of additional collagen used in our manufacture of NeoCart. We currently do not anticipate using any collagen produced by Collagen Solutions during our Phase 3 clinical trial, but anticipate needing additional supplies of collagen above those we anticipate being able to produce in-house upon commercialization, if ever.

We may not be successful in establishing and maintaining development or other strategic partnerships, which could adversely affect our ability to develop and commercialize product candidates.

As part of our strategy, we intend to enter into development or other strategic partnerships in the future, including collaborations with major biotechnology or pharmaceutical companies. We face significant competition in seeking appropriate partners and the negotiation process is time consuming and complex. Moreover, we may not be successful in our efforts to establish a development partnership or other alternative arrangements for any of our other existing or future product candidates and programs because our research and development pipeline may be insufficient, our product candidates and programs may be deemed to be at too early a stage of development for collaborative effort or third parties may not view our product candidates and programs as having the requisite potential to demonstrate safety and efficacy. Even if we are successful in our efforts to establish development partnerships, the terms that we agree upon may not be favorable to us and we may not be able to maintain such development partnerships if, for example, development or approval of a product candidate is delayed or sales of an approved product candidate are disappointing. Any delay in entering into development partnership agreements related to our product candidates could delay the development and commercialization of our product candidates and reduce their competitiveness if they reach the market.

Moreover, if we fail to establish and maintain development or other strategic partnerships related to our product candidates:

- the development of certain of our current or future product candidates may be terminated or delayed;
- our cash expenditures related to development of certain of our current or future product candidates would increase significantly and we may need to seek additional financing;

- we may be required to hire additional employees or otherwise develop expertise, such as sales and marketing expertise, for which we have not budgeted; and
- we will bear all of the risk related to the development of any such product candidates.

We will need to expand our operations and increase the size of our company and we may experience difficulties in managing any such growth.

As we continue to advance NeoCart towards potential commercialization, increase the number of ongoing product development programs and advance our future product candidates through preclinical studies and clinical trials, we will need to expand our development, regulatory, manufacturing, marketing and sales capabilities and, in some cases, collaborate and contract with third parties to provide these capabilities for us. Our management, personnel and systems currently in place may not be adequate to support this future growth. Our need to effectively manage our operations, growth and various projects requires that we:

- successfully attract and recruit new employees or consultants with the requisite expertise and experience;
- manage our preclinical and clinical programs effectively;
- develop a marketing and sales infrastructure if we receive regulatory approval for any product candidate;
- continue to improve our operational, financial and management controls, reporting systems and procedures, including those related to being a public company; and
- construct, validate and effectively operate new and expanded manufacturing facilities.

If we are unable to successfully manage this growth and increased complexity of operations, our business may be adversely affected.

If we fail to attract and keep senior management and key scientific personnel, the future development and commercialization of our product candidates may suffer, harming future regulatory approvals, sales of our product candidates or our results of operations.

We are highly dependent on members of our management and scientific teams, including Adam Gridley, our Chief Executive Officer and President; Jonathan Lieber, our Chief Financial Officer; Gloria Matthews, DVM, Ph.D., DACVS, our Chief Medical Officer; and Stephen Kennedy, our Chief Technology Officer. The loss of the services of any of these persons could impede the achievement of our research, development and commercialization objectives. We do not maintain “key person” insurance for any of our executives or other employees.

Recruiting and retaining qualified scientific, clinical, manufacturing, sales and marketing personnel will also be critical to our success. We may not be able to attract and retain these personnel on acceptable terms given the competition among numerous pharmaceutical and biotechnology companies for similar personnel. We also experience competition for the hiring of scientific and clinical personnel from universities and research institutions. In addition, we rely on consultants and advisors, including scientific and clinical advisors, to assist us in formulating our research and development and commercialization strategy. Our consultants and advisors may be employed by employers other than us and may have commitments under consulting or advisory contracts with other entities that may limit their availability to us.

We may not be able to manage our business effectively if we are unable to attract and retain key personnel and consultants.

Given the specialized nature of regenerative cell therapy and that it is a relatively new field, there is an inherent scarcity of experienced personnel in the field. We may not be able to attract or retain qualified management (including a new chief executive officer), finance, scientific and clinical personnel and consultants due to the

intense competition for qualified personnel and consultants among biotechnology, pharmaceutical and other businesses. If we are not able to attract and retain necessary personnel and consultants to accomplish our business objectives, we may experience constraints that will significantly impede the achievement of our development objectives, our ability to raise additional capital and our ability to implement our business strategy.

Our industry has experienced high turnover of management personnel in recent years. We are highly dependent on the development, regulatory, commercialization and business development expertise of our senior management team. The loss of Mr. Gridley or one or more additional executive officers or key employees, could seriously harm our ability to implement our business strategy successfully. While we have entered into employment contracts with each of our executive officers, any of them could leave our employment at any time, as all of our employees are at-will employees. Replacing key personnel and consultants may be difficult and may take an extended period of time because of the limited number of individuals in our industry with the breadth of skills and experience required to develop, gain regulatory approval of and commercialize products successfully. Competition to hire and retain employees and consultants from this limited pool is intense, and we may be unable to hire, train, retain or motivate these additional key personnel and consultants. Our failure to retain key personnel or consultants could materially harm our business, and the transition to any replacement personnel, particularly at the chief executive officer position, may cause or result in:

- speculation and uncertainty about our business and future direction;
- distraction of our employees and management;
- difficulty in recruiting, hiring, motivating and retaining talented and skilled personnel;
- volatility in our stock price; and
- difficulty in negotiating, maintaining or consummating business or strategic relationships or transactions.

We rely on our scientific and clinical advisors and consultants to assist us in formulating our research, development and clinical strategies. These advisors and consultants are not our employees and may have commitments to, or consulting or advisory contracts with, other entities that may limit their availability to us. In addition, these advisors and consultants typically will not enter into non-compete agreements with us. If a conflict of interest arises between their work for us and their work for another entity, we may lose their services. Furthermore, our advisors may have arrangements with other companies to assist them in developing products or technologies that may compete with ours. If we are unable to maintain consulting relationships with our key advisors or consultants or if they provide services to our competitors, our development and commercialization efforts will be impaired, and our business will be significantly harmed.

Failure to build our finance infrastructure and improve our accounting systems and controls could impair our ability to comply with the financial reporting and internal control requirements for publicly traded companies.

As a public company, we operate in an increasingly demanding regulatory environment, which requires us to comply with the Sarbanes-Oxley Act and the related rules and regulations of the SEC, expanded disclosure requirements, accelerated reporting requirements and more complex accounting rules. Company responsibilities required by the Sarbanes-Oxley Act include establishing corporate oversight and adequate internal control over financial reporting and disclosure controls and procedures. Effective internal controls are necessary for us to produce reliable financial reports and are important to help prevent financial fraud.

Pursuant to Section 404 of the Sarbanes-Oxley Act and related rules, our management will be required to report upon the effectiveness of our internal control over financial reporting when we are no longer a “smaller reporting company” or an “emerging growth company,” each as defined under the Exchange Act. When and if we are a “large accelerated filer” or an “accelerated filer” and are no longer an “emerging growth company,” each as defined in the Exchange Act, our independent registered public accounting firm will be required to attest to the effectiveness of our internal control over financial reporting. However, for so long as we remain an emerging

growth company, we intend to take advantage of certain exemptions from various reporting requirements that are applicable to public companies that are not emerging growth companies, including not being required to comply with the auditor attestation requirements of Section 404 for a period of no more than five years. Once we are no longer an emerging growth company or, if prior to such date, we opt to no longer take advantage of the applicable exemption, we will be required to include an opinion from our independent registered public accounting firm on the effectiveness of our internal control over financial reporting. The rules governing the standards that must be met for management to assess our internal control over financial reporting are complex and require significant documentation, testing, and possible remediation. To comply with the requirements of being a reporting company under the Exchange Act, we need to: upgrade our systems, including information technology; implement additional financial and management controls, reporting systems and procedures; and hire additional accounting and finance staff.

We are also subject to complex tax laws, regulations, accounting principles and interpretations thereof. The preparation of our financial statements requires us to interpret accounting principles and guidance and make estimates and judgments that affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements, as well as the reported revenue generated and expenses incurred during the reporting periods. Our interpretations, estimates and judgments are based on our historical experience and on various other factors that we believe are reasonable under the circumstances, the results of which form the basis for the preparation of our financial statements. U.S. generally accepted accounting principles presentation is subject to interpretation by the SEC, the Financial Accounting Standards Board and various other bodies formed to interpret and create appropriate accounting principles and guidance. In the event that one of these bodies disagrees with our accounting recognition, measurement or disclosure or any of our accounting interpretations, estimates or assumptions, it may have a significant effect on our reported results and may retroactively affect previously reported results. The need to restate our financial results could, among other potential adverse effects, result in us incurring substantial costs, affect our ability to timely file our periodic reports until such restatement is completed, divert the attention of our management and employees from managing our business, result in material changes to our historical and future financial results, result in investors losing confidence in our operating results, subject us to securities class action litigation, and cause our stock price to decline.

We may identify material weaknesses in the future that may cause us to fail to meet our reporting obligations or result in material misstatements of our financial statements.

Our management team is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements in accordance with U.S. generally accepted accounting principles. A material weakness is a deficiency, or a combination of deficiencies, in internal control over financial reporting such that there is a reasonable possibility that a material misstatement of annual or interim financial statements will not be prevented or detected on a timely basis.

We cannot assure you that we will not have material weaknesses or significant deficiencies in our internal control over financial reporting. If we identify any material weaknesses or significant deficiencies that may exist, the accuracy and timing of our financial reporting may be adversely affected, we may be unable to maintain compliance with securities law requirements regarding timely filing of periodic reports in addition to applicable stock exchange listing requirements, and our stock price may decline materially as a result.

If we engage in an acquisition, reorganization or business combination, we will incur a variety of risks that could adversely affect our business operations or our stockholders.

From time to time we have considered, and we will continue to consider in the future, strategic business initiatives intended to further the expansion and development of our business. These initiatives may include acquiring businesses, technologies or products or entering into a business combination with another company.

For instance, in 2011, we acquired ProChon Biotech Ltd. Although we intend to evaluate and consider acquisitions, reorganizations and business combinations in the future, we have no agreements or understandings with respect to any acquisition, reorganization or business combination at this time. Any acquisitions we undertake, including our prior acquisition of ProChon Biotech Ltd., will likely be accompanied by business risks which may include:

- the effect of the acquisition on our financial and strategic position and reputation;
- the need to reprioritize our development programs and even cease development and commercialization of our product candidates;
- the failure of an acquisition to result in expected benefits, which may include benefits relating to enhanced revenues, technology, human resources, costs savings, operating efficiencies, goodwill and other synergies;
- the difficulty, cost and management effort required to integrate the acquired businesses, including costs and delays in implementing common systems and procedures and costs and delays caused by communication difficulties;
- the assumption of certain known or unknown liabilities of the acquired business, including litigation-related liabilities;
- the reduction of our cash available for operations and other uses, the increase in amortization expense related to identifiable assets acquired, potentially dilutive issuances of equity securities or the incurrence of debt;
- a lack of experience in new markets, new business culture, products or technologies or an initial dependence on unfamiliar distribution partners;
- the possibility that we will pay more than the value we derive from the acquisition;
- the impairment of relationships with customers, partners or suppliers of the acquired business; and
- the potential loss of key employees of the acquired company.

These factors could harm our business, results of operations or financial condition.

In addition to the risks commonly encountered in the acquisition of a business or assets as described above, we may also experience risks relating to the challenges and costs of evaluating or closing a transaction, including distraction of our management team from normal business operations. The risks described above may be exacerbated as a result of managing multiple acquisitions at once.

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

We have incurred substantial losses during our history and do not expect to become profitable in the foreseeable future and may never achieve profitability. To the extent that we continue to generate taxable losses, unused losses will carry forward to offset future taxable income, if any, until such unused losses expire. We may be unable to use these losses to offset income before such unused losses expire. Under Sections 382 and 383 of the Internal Revenue Code (Code), utilization of net operating losses and research and development credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred or that could occur in the future. In general, an “ownership change” as defined by Section 382 of the Code results from a transaction or series of transactions over a three year period resulting in an ownership change of more than 50 percentage points of the outstanding stock of a company by certain stockholders. We have in the past experienced ownership changes that have resulted in limitations on the use of a portion of our net operating loss carryforwards. We have completed a study to assess whether an ownership change has occurred or whether there have been multiple ownership changes since our formation. The results of this study indicated we experienced ownership changes, as defined by Section 382 of the Code, in each of 2006, 2011, 2012, 2013 and 2016. If we experience further ownership changes, our ability to utilize our net operating loss carryforwards could be further limited.

Our internal computer systems, or those of our development partners, third-party clinical research organizations or other contractors or consultants, may fail or suffer security breaches, which could result in a material disruption of our product development programs.

Despite the implementation of security measures, our internal computer systems and those of our development partners, third-party clinical research organizations and other contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. While we have not experienced any such system failure, accident 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 programs. For example, the loss of clinical trial data for any of our product candidates could result in delays in our regulatory approval efforts and significantly increase our costs to recover or reproduce the data. To the extent that any disruption or security breach results in a loss of or damage to our data or applications or other data or applications relating to our technology or product candidates, or inappropriate disclosure of confidential or proprietary information, we could incur liabilities and the further development of our product candidates could be delayed.

We use hazardous chemicals and biological materials in our business. Any claims relating to improper handling, storage or disposal of these materials could be time consuming and costly. We may incur significant costs complying with environmental laws and regulations.

Our research and development and manufacturing processes involve the controlled use of hazardous materials, including chemicals and biological materials. Our operations produce hazardous waste products. We cannot eliminate the risk of accidental contamination or discharge and any resultant injury from these materials. We may be sued for any injury or contamination that results from our use or the use by third parties of these materials, and our liability may exceed our insurance coverage and our total assets. Federal, state and local laws and regulations govern the use, manufacture, storage, handling and disposal of these hazardous materials and specified waste products, as well as the discharge of pollutants into the environment and human health and safety matters.

Compliance with environmental laws and regulations may be expensive and may impair our research, development and production efforts. If we fail to comply with these requirements, we could incur substantial costs, including civil or criminal fines and penalties, clean-up costs or capital expenditures for control equipment or operational changes necessary to achieve and maintain compliance. In addition, we cannot predict the impact on our business of new or amended environmental laws or regulations or any changes in the way existing and future laws and regulations are interpreted and enforced.

Our employees may engage in misconduct or other improper activities, including noncompliance with regulatory standards and requirements and insider trading.

We are exposed to the risk of employee fraud or other misconduct. Misconduct by employees could include intentional failures to comply with the regulations of the FDA or foreign regulators, failure to provide accurate information to regulatory authorities, failure to comply with manufacturing standards we have established, failure to comply with federal and state health care fraud and abuse laws and regulations in the United States and abroad, failure to report financial information or data accurately or disclose unauthorized activities to us. In particular, sales, marketing and business arrangements in the healthcare industry are subject to extensive laws and regulations intended to prevent fraud, misconduct, kickbacks, self-dealing and other abusive practices. These laws and regulations may restrict or prohibit a wide range of pricing, discounting, marketing and promotion, sales commission, customer incentive programs and other business arrangements. Employee misconduct could also involve the improper use of information obtained in the course of clinical trials, which could result in regulatory sanctions and cause harm to our reputation. We have adopted 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 this activity 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 comply with these laws or 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 significant fines or other sanctions.

In addition, during the course of our operations our directors, executives and employees may have access to material, nonpublic information regarding our business, our results of operations or potential transactions we are considering. We may not be able to prevent a director, executive or employee from trading in our common stock on the basis of, or while having access to, material, nonpublic information. If a director, executive or employee was to be investigated or an action was to be brought against a director, executive or employee for insider trading, it could have a negative impact on our reputation and our stock price. Such a claim, with or without merit, could also result in substantial expenditures of time and money and divert attention of our management team from other tasks important to the success of our business.

Costs associated with being a public reporting company are significant, and public reporting requirements divert significant company resources and management attention.

We are subject to the reporting requirements of the Exchange Act and the other rules and regulations of the SEC. We are working with our legal, independent accounting and financial advisors to identify those areas in which changes should be made to our financial and management control systems to manage our growth and our obligations as a public reporting company including preparing for the commercialization of NeoCart, if approved. These areas include corporate governance, corporate control, disclosure controls and procedures, and financial reporting and accounting systems. We have made, and will continue to make, changes in these and other areas. Compliance with the various reporting and other requirements applicable to public reporting companies will require considerable time, attention of management and financial resources. In addition, the changes we make may not be sufficient to allow us to satisfy our obligations as a public reporting company on a timely basis.

Further, the listing requirements of NASDAQ require that we satisfy certain corporate governance requirements relating to director independence, distributing annual and interim reports, stockholder meetings, approvals and voting, soliciting proxies, conflicts of interest and a code of conduct. Our management and other personnel will need to devote a substantial amount of time to ensure that we comply with all of these requirements. Moreover, the reporting requirements, rules and regulations will increase our legal and financial compliance costs and will make some activities more time-consuming and costly. These reporting requirements, rules and regulations, coupled with the increase in potential litigation exposure associated with being a public company, could also make it more difficult for us to attract and retain qualified persons to serve as our directors or executive officers, or to obtain certain types of insurance, including directors' and officers' insurance, on acceptable terms.

Our business is subject to the risks of earthquakes, fire, power outages, floods and other catastrophic events, and to interruption by manmade problems such as terrorism. If any of our manufacturing, processing or storage facilities are damaged or destroyed, our business and prospects would be adversely affected.

A significant natural disaster, such as an earthquake, fire or flood, or a significant power outage, could have a material adverse impact on our business, operating results and financial condition. If any of our manufacturing, processing or storage facilities, or any of the equipment in such facilities were to be damaged or destroyed, this would force us to delay or halt our clinical trial or commercial production processes. We currently produce materials for our clinical trials at our manufacturing facilities located in Waltham, Massachusetts. If these facilities or the equipment in them are significantly damaged or destroyed, we may not be able to quickly or inexpensively replace our manufacturing capacity. In addition, natural disasters could affect our third-party service providers' and manufacturers ability to perform services and provide materials for us on a timely basis. If these third parties do not successfully carry out their contractual duties or meet expected deadlines, our efforts to obtain regulatory approvals for, and to commercialize, our product candidates may be delayed or prevented. For example, if a central laboratory holding all of our clinical product supply were to suffer a catastrophic loss of their facility, we would be required to delay our clinical trials. In addition, acts of terrorism could cause

disruptions in our business or the business of our third-party service providers, partners, customers or the economy as a whole.

Our loan and security agreement contains operating covenants and restrictions that may restrict our business and financing activities.

We are party to a loan and security agreement with Silicon Valley Bank, which provides for a line of credit of up to $1.75 million in the aggregate to finance certain equipment purchases. Borrowings under this agreement are secured by a first priority lien over all equipment purchased using the line of credit. This agreement restricts our ability to, among other things:

- sell assets;
- engage in any business other than our current business;
- merge or consolidate with other entities;
- incur additional indebtedness;
- create liens on our assets;
- make investments;
- pay or declare dividends, or, in certain cases, repurchase our stock;
- enter into transactions with affiliates; or
- make any payment on subordinated indebtedness.

The operating covenants and restrictions in the loan and security agreement, as well as covenants and restrictions in any future financing agreements that we may enter into, may restrict our ability to finance our operations, engage in business activities or expand or fully pursue our business strategies. Our ability to comply with these covenants may be affected by events beyond our control, and we may not be able to meet those covenants. A breach of any of these covenants could result in a default under the loan and security agreement or any future financing agreement, which could cause all of the outstanding indebtedness under the facility to become immediately due and payable and terminate all commitments to extend further credit.

We cannot assure you that we will continue to maintain sufficient cash reserves or that our business will ever generate cash flow from operations at levels sufficient to permit us to pay principal, premium, if any, and interest on our indebtedness, or that our cash needs will not increase. If we are unable to generate sufficient cash flow or otherwise obtain funds necessary to make required payments, or if we fail to comply with the various requirements of our loan and security agreement with Silicon Valley Bank, or any indebtedness which we may incur in the future, we would be in default under our agreement with Silicon Valley Bank or other indebtedness we may incur in the future. Any default under our agreement with Silicon Valley Bank, or any indebtedness that we may incur in the future, could have a material adverse effect on our business, results of operations and financial condition.

We are increasingly dependent on information technology systems, infrastructure and data.

We are increasingly dependent upon information technology systems, infrastructure and data. Our computer systems may be vulnerable to service interruption or destruction, malicious intrusion and random attack. Security breaches pose a risk that sensitive data, including intellectual property, clinical data, trade secrets or personal information may be exposed to unauthorized persons or to the public. Cyber-attacks are increasing in their frequency, sophistication and intensity, and have become increasingly difficult to detect. Cyber-attacks could include the deployment of harmful malware, denial-of service, social engineering and other means to affect service reliability and threaten data confidentiality, integrity and availability. Our key business partners face similar risks, and a security breach of their systems could adversely affect our security posture. While we

continue to invest data protection and information technology, there can be no assurance that our efforts will prevent service interruptions, or identify breaches in our systems, that could adversely affect our business and operations and/or result in the loss of critical or sensitive information, which could result in financial, legal, business or reputational harm.

Risks Related to Regulatory Approval

If we fail to complete clinical trials and obtain regulatory approval for NeoCart, our business would be significantly harmed.

We have not completed clinical development for any of our product candidates and will only obtain regulatory approval to commercialize a product candidate if we can demonstrate to the satisfaction of the FDA or comparable foreign regulatory authorities in well-designed and conducted clinical trials that the product candidate is safe, effective, and otherwise meets the appropriate standards required for approval for a particular class of products or indication. Clinical trials are lengthy, complex and extremely expensive processes with uncertain results. A failure of one or more clinical trials may occur at any stage. Of the large number of products in development, only a small percentage successfully complete the FDA regulatory approval process and are commercialized.

We have never obtained marketing approval from the FDA or any comparable foreign regulatory authority for any product candidate. Our ability to obtain regulatory approval of our product candidates depends on, among other things, whether our clinical trials demonstrate statistically significant efficacy with safety issues that do not potentially outweigh the therapeutic benefit of the product candidates, and whether the regulatory agencies agree that the data from our future clinical trials is sufficient to support approval for any of our product candidates. The final results of our current and future clinical trials may not meet the FDA's or other regulatory agencies' requirements to approve a product candidate for marketing, and the regulatory agencies may otherwise determine that our manufacturing processes or facilities are insufficient to support approval. We may need to conduct more clinical trials than we currently anticipate. Even if we do receive FDA or other regulatory agency approval, we may not be successful in commercializing approved product candidates. If any of these events occur, our business could be materially harmed and the value of our common stock would likely decline.

Our clinical development of NeoCart could be substantially delayed if the FDA requires us to conduct additional studies or trials or imposes other requirements or restrictions.

We will need to generate and provide the FDA with comparability data from our new raw material production for the collagen critical raw materials used in our manufacturing process and intended for clinical use. The FDA may also require us to generate additional preclinical or clinical data to support the use of these new critical raw material suppliers in our NeoCart trial. Additionally, the FDA may impose other requirements on the protocol for our NeoCart trial. These additional requirements may cause further delays in our NeoCart trial which could require us to incur additional development costs, seek funding for these increased costs or delay or cease our clinical development activities for NeoCart. Any inability to advance NeoCart or any other product candidate through clinical development would have a material adverse effect on our business. For example, the recently enacted Food and Drug Administration Safety and Innovation Act made permanent the Pediatric Research Equity Act, which requires a sponsor to conduct pediatric studies for most tissue regeneration products for a new active ingredient, new indication, new dosage form, new dosing regimen or new route of administration. Under the Pediatric Research Equity Act, original NDAs and BLAs and supplements thereto must contain a pediatric assessment unless the sponsor has received a deferral or waiver. The required assessment must evaluate the safety and effectiveness of the product for the claimed indications in all relevant pediatric subpopulations and support dosing and administration for each pediatric subpopulation for which the product is safe and effective. The sponsor or FDA may request a deferral of pediatric studies for some or all of the pediatric subpopulations, and it is likely that we will request such a deferral. A deferral may be granted for several reasons, including a finding that the tissue regeneration products is ready for approval for use in adults before pediatric studies are complete or that additional safety or effectiveness data needs to be collected before the pediatric studies begin.

The FDA must send a non-compliance letter to any sponsor that fails to submit the required assessment, keep a deferral current or fails to submit a request for approval of a pediatric formulation.

We are subject to numerous U.S. federal and state laws pertaining to health care fraud and abuse, including anti-kickback, self-referral, false claims and fraud laws, and any violation by us of such laws could result in fines or other penalties.

If one or more of our product candidates is approved, we will be subject to U.S. federal and state laws intended to prevent health care fraud and abuse. The federal anti-kickback statute prohibits the offer, receipt, or payment of remuneration in exchange for or to induce the referral of patients or the use of products or services that would be paid for in whole or part by Medicare, Medicaid or other federal health care programs. Remuneration has been broadly defined to include anything of value, including cash, improper discounts, and free or reduced price items and services. Many states have similar laws that apply to their state health care programs as well as private payors. Violations of the anti-kickback laws can result in exclusion from federal health care programs and substantial civil and criminal penalties.

The False Claims Act imposes liability on persons who, among other things, present or cause to be presented false or fraudulent claims for payment by a federal health care program. The False Claims Act has been used to prosecute persons submitting claims for payment that are inaccurate or fraudulent, that are for services not provided as claimed, or for services that are not medically necessary. The False Claims Act includes a whistleblower provision that allows individuals to bring actions on behalf of the federal government and share a portion of the recovery of successful claims. If our marketing or other arrangements were determined to violate the False Claims Act or anti-kickback or related laws, then our revenue could be adversely affected, which would likely harm our business, financial condition and results of operations.

State and federal authorities have aggressively targeted medical technology companies for alleged violations of these anti-fraud statutes, based on improper research or consulting contracts with doctors, certain marketing arrangements that rely on volume-based pricing, off-label marketing schemes and other improper promotional practices. Companies targeted in such prosecutions have paid substantial fines in the hundreds of millions of dollars or more, have been forced to implement extensive corrective action plans or Corporate Integrity

Agreements, and have often become subject to consent decrees severely restricting the manner in which they conduct their business. If we become the target of such an investigation or prosecution based on our contractual relationships with providers or institutions, or our marketing and promotional practices, we could face similar sanctions, which would materially harm our business.

The Foreign Corrupt Practices Act and similar worldwide anti-bribery laws generally prohibit companies and their intermediaries from making improper payments to non-U.S. officials for the purpose of obtaining or retaining business. We cannot assure you that our internal control policies and procedures will protect us from reckless or negligent acts committed by our employees, future distributors, partners, collaborators or agents. Violations of these laws, or allegations of such violations, could result in fines, penalties or prosecution and have a negative impact on our business, results of operations and reputation.

Also, the Physician Payment Sunshine Act imposes new reporting and disclosure requirements on drug, device, biologic and medical supply manufacturers for any “transfer of value” made or distributed to prescribers and other healthcare providers. In addition, device and drug manufacturers will also be required to report and disclose any investment interests held by physicians and their immediate family members during the preceding calendar year. Failure to submit required information may result in significant civil monetary penalties.

Our failure to comply with extensive governmental regulation may significantly affect our operating results.

Even if we obtain regulatory approval for some or all of our product candidates, we will continue to be subject to extensive ongoing requirements by the FDA, as well as by a number of foreign, national, state and local agencies.

These regulations will impact many aspects of our operations, including testing, research and development, manufacturing, safety, efficacy, labeling, storage, quality control, adverse event reporting, import and export, record keeping, approval, distribution, advertising and promotion of our future products. We must also submit new or supplemental applications and obtain FDA approval for certain changes to an approved product, product labeling or manufacturing process. Application holders must also submit advertising and other promotional material to the FDA and report on ongoing clinical trials. The FDA enforces post-marketing regulatory requirements, including cGMP requirements, through periodic unannounced inspections. We do not know whether we will pass any future FDA inspections. Failure to pass an inspection could disrupt, delay or shut down our manufacturing operations. Failure to comply with applicable regulatory requirements could, among other things, result in:

- administrative or judicial enforcement actions;
- changes to advertising;
- failure to obtain marketing approvals for our product candidates;
- revocation or suspension of regulatory approvals of products;
- product seizures or recalls;
- court-ordered injunctions;
- import detentions;
- delay, interruption or suspension of product manufacturing, distribution, marketing and sales; or
- civil or criminal sanctions.

The discovery of previously unknown problems with our product candidates or future products may result in restrictions of the products, including withdrawal from the market. In addition, the FDA may revisit and change its prior determinations with regard to the safety or efficacy of our future products. If the FDA's position changes, we may be required to change our labeling or cease to manufacture and market our future products.

Even prior to any formal regulatory action, we could voluntarily decide to cease the distribution and sale or recall any of our future products if concerns about their safety or efficacy develop.

In their regulation of advertising and other promotion, the FDA and the U.S. Federal Trade Commission may issue correspondence alleging that some advertising or promotional practices are false, misleading or deceptive. The FDA and the U.S. Federal Trade Commission are authorized to impose a wide array of sanctions on companies for such advertising and promotion practices, which could result in any of the following:

- our incurrence of substantial expenses, including fines, penalties, legal fees and costs to comply with the FDA's requirements;
- our being required to change in the methods of marketing and selling products;
- our being required to take FDA mandated corrective action, which may include placing advertisements or sending letters to physicians rescinding previous advertisements or promotions; or
- a disruption in the distribution of products and loss of sales until compliance with the FDA's position is obtained.

Improper promotional activities may also lead to investigations by federal or state prosecutors, and result in criminal and civil penalties. If we become subject to any of the above requirements, it could be damaging to our reputation and restrict our ability to sell or market our future products, and our business condition could be adversely affected. We may also incur significant expenses in defending ourselves.

Physicians may prescribe pharmaceutical or biologic products for uses that are not described in a product's labeling or differ from those tested by us and approved by the FDA. While such "off-label" uses are common and

the FDA does not regulate physicians' choice of treatments, the FDA does restrict a manufacturer's communications on the subject of off-label use. Companies cannot promote FDA-approved pharmaceutical or biologic products for off-label uses, but under certain limited circumstances they may disseminate to practitioners' articles published in peer-reviewed journals. To the extent allowed by the FDA, we intend to disseminate peer-reviewed articles on our future products to practitioners. If, however, our activities fail to comply with the FDA's regulations or guidelines, we may be subject to warnings from, or enforcement action by, the FDA or other regulatory or law enforcement authorities.

Depending on the circumstances, failure to meet post-approval requirements can result in criminal prosecution, fines or other penalties, injunctions, recall or seizure of products, total or partial suspension of production, denial or withdrawal of pre-marketing product approvals, or refusal to allow us to enter into supply contracts, including government contracts. Any government investigation of alleged violations of law could require us to expend significant time and resources in response, and could generate negative publicity.

Even if we obtain regulatory approval for a product candidate, our products will remain subject to regulatory scrutiny.

Any product candidate for which we obtain marketing approval, along with the manufacturing processes, qualification testing, post-approval clinical data, labeling and promotional activities for such product, will be subject to continuing and additional requirements of the FDA and other regulatory authorities. These requirements include submissions of safety and other post-marketing information, reports, registration and listing requirements, cGMP requirements relating to quality control, quality assurance and corresponding maintenance of records and documents, 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 product may be marketed or to conditions of approval, or contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the product. The FDA closely regulates the post-approval marketing and promotion of pharmaceutical and biological products to ensure such products are marketed only for the approved indications and in accordance with the provisions of the approved labeling.

In addition, later discovery of previously unknown problems with our products, manufacturing processes, or failure to comply with regulatory requirements, may lead to various adverse results, including:

- restrictions on such products, manufacturers or manufacturing processes;
- restrictions on the labeling or marketing of a product;
- restrictions on product distribution or use;
- requirements to conduct post-marketing clinical trials;
- requirements to institute a risk evaluation and mitigation strategy to monitor safety of the product post-approval;
- warning letters issued by the FDA or other regulatory authorities;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- recalls of products, fines, restitution or disgorgement of profits or revenue;
- suspension, revocation or withdrawal of marketing approvals;
- refusal to permit the import or export of our products; or
- injunctions or the imposition of civil or criminal penalties.

The FDA's policies may change and additional government regulations may be enacted that could prevent, limit or delay regulatory approval of our product candidates. If we are slow or unable to adapt to changes in existing

requirements or the adoption of new requirements or policies, or if we are not able to maintain regulatory compliance, we may lose any marketing approval that we may have obtained, which would adversely affect our business, prospects and ability to achieve or sustain profitability.

Risks Related to Our Intellectual Property

Our success depends on our ability to protect our intellectual property and our proprietary technologies.

Our commercial success depends in part on our ability to obtain and maintain patent protection and trade secret protection for our product candidates, proprietary technologies and their uses as well as our ability to operate without infringing upon the proprietary rights of others. There can be no assurance that our patent applications or those of our licensors will result in additional patents being issued or that issued patents will afford sufficient protection against competitors with similar technology, nor can there be any assurance that the patents issued will not be infringed, designed around, or invalidated by third parties. Even issued patents may later be found unenforceable or may be modified or revoked in proceedings instituted by third parties before various patent offices or in courts. The degree of future protection for our proprietary rights is uncertain. Only limited protection may be available and may not adequately protect our rights or permit us to gain or keep any competitive advantage. This failure to properly protect the intellectual property rights relating to these product candidates could have a material adverse effect on our financial condition and results of operations.

Composition-of-matter patents are generally considered to be the strongest form of intellectual property protection as such patents provide protection without regard to any method of use. We cannot be certain that the claims in our patent applications covering composition-of-matter of our product candidates will be considered patentable by the U.S. Patent and Trademark Office and courts in the United States or by the patent offices and courts in foreign countries, nor can we be certain that the claims in our issued composition-of-matter patents will not be found invalid or unenforceable if challenged. Method-of-use patents protect the use of a product for the specified method. This type of patent does not prevent a competitor from making and marketing a product that is identical to our product for a use that is outside the scope of the patented method. Moreover, even if competitors do not actively promote their product for our targeted indications, physicians may prescribe these products “off-label.” Although off-label prescriptions may infringe or contribute to the infringement of method-of-use patents, the practice is common and such infringement is difficult to prevent or prosecute.

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 U.S. Patent and Trademark Office 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 than we do 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 treatments that prove successful, as a matter of public policy regarding worldwide health concerns.

- 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.

In addition, we rely on the protection of our trade secrets and proprietary know-how. Although we have taken steps to protect our trade secrets and unpatented know-how, including entering into confidentiality agreements with third parties, and confidential information and inventions agreements with employees, consultants and advisors, third parties may still obtain this information or may come upon this or similar information independently. If any of these events occurs or if we otherwise lose protection for our trade secrets or proprietary know-how, the value of this information may be greatly reduced.

If we or any of our future development or collaborative partners are sued for infringing intellectual property rights of third parties, it will be costly and time consuming, and an unfavorable outcome in that litigation could have a material adverse effect on our business.

Our success also depends on our ability and the ability of our current or future development or collaborative partners to develop, manufacture, market and sell our product candidates without infringing upon the proprietary rights of third parties. Numerous U.S. and foreign-issued patents and pending patent applications owned by third parties exist in the fields in which we are developing product candidates, some of which may contain claims that overlap with the subject matter of our intellectual property or are directed at our product candidates. When we become aware of patents held by third parties that may implicate the manufacture, development or commercialization of our product candidates, we evaluate our need to license rights to such patents. If we need to license rights from third parties to manufacture, develop or commercialize our product candidates, there can be no assurance that we will be able to obtain a license on commercially reasonable terms or at all.

Because patent applications can take many years to issue there may be currently pending applications, unknown to us, that may later result in issued patents upon which our product candidates or proprietary technologies may infringe. Similarly, there may be issued patents relevant to our product candidates of which we are not aware.

There is a substantial amount of litigation involving patent and other intellectual property rights in the biologics industry generally. If a third-party claims that we or any of our licensors, suppliers or development partners infringe upon a third-party's intellectual property rights, we may have to:

- seek to obtain licenses that may not be available on commercially reasonable terms, if at all;
- abandon an infringing product candidate or redesign our products or processes to avoid infringement;
- pay substantial damages including, in an exceptional case, treble damages and attorneys' fees, which we may have to pay if a court decides that the product candidate or proprietary technology at issue infringes upon or violates the third-party's rights;
- pay substantial royalties or fees or grant cross-licenses to our technology; or
- defend litigation or administrative proceedings that may be costly whether we win or lose, and which could result in a substantial diversion of our financial and management resources.

We may be involved in lawsuits to protect or enforce our patents or the patents of our licensors, which could be expensive, time consuming and unsuccessful.

Competitors may infringe upon our patents or the patents of our licensors. To counter infringement or unauthorized use, we may be required to file infringement claims, which can be expensive and time consuming. An adverse result in any litigation or defense proceedings could put one or more of our patents at risk of being invalidated, found to be unenforceable or interpreted narrowly and could put our patent applications at risk of not issuing. 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 this type of litigation.

Most of our competitors are larger than we are and have substantially greater resources. They are, therefore, likely to be able to sustain the costs of complex patent litigation longer than we could. In addition, the uncertainties associated with litigation could have a material adverse effect on our ability to raise the funds necessary to continue our clinical trials, continue our internal research programs, in-license needed technology, or enter into development partnerships that would help us bring our product candidates to market.

In addition, any future patent litigation, interference or other administrative proceedings will result in additional expense and distraction of our personnel. An adverse outcome in such litigation or proceedings may expose us, or any of our future development partners to loss of our proprietary position, expose us to significant liabilities or require us to seek licenses that may not be available on commercially acceptable terms, if at all.

Our issued patents could be found invalid or unenforceable if challenged in court which could have a material adverse effect on our business.

If we or any of our future development partners were to initiate legal proceedings against a third party to enforce a patent covering one of our product candidates or one of our future product candidates, the defendant could counterclaim that our patent is invalid or unenforceable. In patent litigation in the United States, defendant counterclaims alleging invalidity or unenforceability are commonplace. Grounds for a validity challenge could be an alleged failure to meet any of several statutory requirements, including lack of novelty, obviousness or non- enablement. Grounds for an unenforceability assertion could be an allegation that someone connected with prosecution of the patent withheld relevant information from the U.S. Patent and Trademark Office, or made a misleading statement, during prosecution. Third parties may also raise similar claims before the U.S. Patent and Trademark Office even outside the context of litigation. The outcome following legal assertions of invalidity and unenforceability is unpredictable. With respect to the validity question, for example, we cannot be certain that there is no invalidating prior art, of which we and the patent examiner were unaware during prosecution. If a defendant were to prevail on a legal assertion of invalidity or unenforceability, we would lose at least part, and perhaps all, of the patent protection on such product candidate. Such a loss of patent protection would have a material adverse impact on our business.

We may be subject to claims that our consultants or independent contractors have wrongfully used or disclosed alleged trade secrets of their other clients or former employers to us, which could subject us to costly litigation.

As is common in the biotechnology industry, we engage the services of consultants to assist us in the development of our product candidates. Many of these consultants were previously employed at, or may have previously or may be currently providing consulting services to, other biotechnology or pharmaceutical companies, including our competitors or potential competitors. We may become subject to claims that our company or a consultant inadvertently or otherwise used or disclosed trade secrets or other information proprietary to their former employers or their former or current clients. Litigation may be necessary to defend against these claims. Even if we are successful in defending against these claims, litigation could result in substantial costs and be a distraction to our management team.

Changes in U.S. patent law could diminish the value of patents in general, which could materially impair our ability to protect our product candidates.

As is the case with other biotechnology companies, our success is heavily dependent on intellectual property, particularly patents. Obtaining and enforcing patents in the biotechnology industry involve technological and legal complexity. Therefore, obtaining and enforcing biotechnology patents is costly, time consuming and inherently uncertain. In addition, Congress recently passed patent reform legislation. The Supreme Court has ruled on several patent cases in recent years, either narrowing the scope of patent protection available in certain circumstances or weakening 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 U.S. Patent and Trademark Office, 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 we might obtain in the future.

We may not be able to protect our intellectual property rights throughout the world which could materially, negatively affect our business.

Filing, prosecuting and defending patents on 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 products and further, may export otherwise infringing products to territories where we have patent protection, but enforcement is not as strong as that in the United States. These products 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 certain countries, particularly certain developing countries, do not favor the enforcement of patents and other intellectual property protection, particularly those relating to biotechnology, which could make it difficult for us to stop the infringement of our patents or marketing of competing products in violation of our proprietary rights 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. 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 and may adversely affect our business.

If our trademarks and trade names are not adequately protected, then we may not be able to build name recognition in our markets of interest and our business may be adversely affected.

Our registered or unregistered trademarks or trade names may be challenged, infringed, circumvented or declared generic or determined to be infringing on other marks. We may not be able to protect our rights to these trademarks and trade names, which we need to build name recognition by potential partners or customers in our markets of interest. Over the long term, if we are unable to establish name recognition based on our trademarks and trade names, then we may not be able to compete effectively and our business may be adversely affected.

Risks Related to Our Common Stock

The trading price of our common stock has been, and is likely to continue to be, volatile, and you might not be able to sell your shares at or above the price you paid.

We completed our initial public offering in December 2014 at an initial price to the public of $11.00 per share. Subsequently, as of March 8, 2017 our common stock has traded as low as $1.39 per share. The realization of any of the risks described in these risk factors or other unforeseen risks could have a dramatic and adverse effect on the market price of our common stock. The trading price of our common stock is likely to continue to be highly volatile and could be subject to wide fluctuations in response to various factors, some of which are beyond our control. These factors include those discussed elsewhere in this “Risk Factors” section and others such as:

- the delay or failure in initiating, enrolling or completing preclinical studies or clinical trials, or unsatisfactory results of these trials;
- announcements about us or about our competitors including clinical trial results, regulatory approvals, or new product candidate introductions and the revenue and growth potential of such new products;
- developments concerning our current or future development partner, licensors or product candidate manufacturers;
- litigation and other developments relating to our patents or other proprietary rights or those of our competitors;
- conditions in the pharmaceutical or biotechnology industries and the economy as a whole;
- governmental regulation and legislation;
- the recruitment or departure of members of our board of directors, management team or other key personnel;
- changes in our operating results;
- any changes in the financial projections we may provide to the public, our failure to meet these projections, or changes in recommendations by any securities analysts that elect to follow our common stock;
- any change in securities analysts' estimates of our performance, or our failure to meet analysts' expectations;
- the expiration of market standoff or contractual lock-up agreements;
- sales or potential sales of substantial amounts of our common stock; and
- price and volume fluctuations in the overall stock market or resulting from inconsistent trading volume levels of our shares.

In recent months and years, the stock market in general, and the market for pharmaceutical and biotechnological companies in particular, has experienced extreme price and volume fluctuations that have often been unrelated or disproportionate to changes in the operating performance of the companies whose stock is experiencing those price and volume fluctuations. In addition, Brexit or actions taken by the new presidential administration and Congress could adversely affect United States, European or worldwide economic or market conditions and could contribute to instability and volatility in global financial markets. Broad market and industry factors may seriously affect the market price of our common stock, regardless of our actual operating performance.

Our quarterly operating results may fluctuate substantially, which may cause the price of our common stock to fluctuate substantially.

We expect our quarterly operating results to be subject to fluctuations. Our net income or loss and other operating results may be affected by numerous factors, including:

- any variations in the level of expenses related to our development and expected commercialization of NeoCart;
- derivative instruments recorded at fair value;
- the addition or termination of any clinical trials;
- any regulatory or clinical developments affecting NeoCart; and
- the nature and terms of any stock-based compensation grants and any intellectual property infringement lawsuits in which we may become involved.

If our quarterly operating results fall below the expectations of investors or securities analysts, the price of our common stock could decline substantially. Furthermore, any quarterly fluctuations in our operating results may,

in turn, cause the price of our stock to fluctuate substantially. We believe that quarterly comparisons of our financial results are not necessarily meaningful and should not be relied upon as an indication of our future performance.

Our stock price may be volatile, and securities class action litigation has often been instituted against companies following periods of volatility of their stock price. Any such litigation, if instituted against us, could result in substantial costs and a diversion of our management's attention and resources.

In the past, following periods of volatility in the overall market and the market price of a particular company's securities, securities class action litigation has often been instituted against these companies. This litigation, if instituted against us, could result in substantial costs and a diversion of our management's attention and resources.

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

The trading market for our common stock will depend in part on the research and reports that securities and industry analysts publish about us or our business. We currently have limited research coverage by securities analysts. If no additional securities or industry analysts commence coverage of our company, the trading price for our stock could suffer. In the event we obtain additional securities or industry analyst coverage, if one or more of the analysts who covers us downgrades our stock or publishes unfavorable research about our business, or if our clinical trials or operating results fail to meet the analysts' expectations, our stock price would likely decline. If one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, demand for our stock could decrease, which could cause our stock price and trading volume to decline.

Raising additional funds by issuing securities or through licensing or lending arrangements may cause dilution to our existing stockholders, restrict our operations or require us to relinquish proprietary rights.

We will need to raise additional funding in order to file a BLA for NeoCart, create additional manufacturing capacity and to commercialize NeoCart and to conduct the research and development and clinical and regulatory activities necessary to bring other product candidates to market. To the extent that we raise additional capital by issuing equity securities, the share ownership of existing stockholders will be diluted. Any future debt financing may involve covenants that restrict our operations, including limitations on our ability to incur liens or additional debt, pay dividends, redeem our stock, make certain investments, and engage in certain merger, consolidation, or asset sale transactions. In addition, if we seek funds through arrangements with collaborative partners, these arrangements may require us to relinquish rights to some of our technologies or product candidates or otherwise agree to terms unfavorable to us.

We have never paid and do not intend to pay cash dividends and, consequently, your ability to achieve a return on your investment will depend on appreciation in the price of our common stock.

We have never paid cash dividends on any of our capital stock, and we currently intend to retain future earnings, if any, to fund the development and growth of our business. Therefore, you are not likely to receive any dividends on our common stock for the foreseeable future or at all. Since we do not intend to pay dividends, your ability to receive a return on your investment will depend on any future appreciation in the market value of our common stock. There is no guarantee that our common stock will appreciate or even maintain the price at which you have purchased it.

Our principal stockholders and management own a significant percentage of our stock and will be able to exert significant control over matters subject to stockholder approval.

As of March 8, 2017, our executive officers, directors, holders of more than 5% of our capital stock and their respective affiliates beneficially owned 58% of our outstanding capital stock. These stockholders have the ability

to influence us through their ownership position. These stockholders are able to determine all matters requiring stockholder approval. For example, these stockholders are able to control elections of directors, amendments of our organizational documents, or approval of any merger, sale of assets, or other major corporate transaction. This may prevent or discourage unsolicited acquisition proposals or offers for our common stock that you may feel are in your best interest as one of our stockholders.

Substantial future sales of shares by existing stockholders, including pursuant to our equity incentive plans, or the perception that such sales may occur, could cause our stock price to decline.

A small number of institutional investors and private equity funds hold a significant number of shares of our common stock and all of our shares of Series A Convertible Preferred Stock and warrants to purchase our common stock issued in our September 2016 private placement. If these existing stockholders, particularly our directors and executive officers and the venture capital funds affiliated with our current and former directors, sell substantial amounts of our common stock in the public market, or are perceived by the public market as intending to sell substantial amounts of our common stock, the trading price of our common stock could decline.

Some of pre-IPO existing security holders have demand and piggyback rights to require us to register with the SEC up to 4,479,418 shares of our common stock. If we register these shares of common stock, the stockholders would be able to sell those shares freely in the public market, subject to Rule 144 transfer restrictions applicable to affiliates. In November 2016, we registered 26,800,001 shares of common stock for resale by selling stockholders, including 10,737,275 shares of common stock underlying our outstanding Series A Convertible Preferred Stock and 13,466,667 shares of common stock underlying outstanding warrants issued in connection with our September 2016 private placement. The selling stockholders in the private placement are able to freely trade such shares of common stock, subject to Rule 144 transfer restrictions applicable to affiliates. We have registered an additional 2,436,666 shares of our common stock that we may issue under our equity plans. Once we issue these shares, they can be freely sold in the public market upon issuance, contractual lock-up agreements, or Rule 144 transfer restrictions applicable to affiliates.

Our stock price does not meet the minimum continued listing requirements for Market Value of Listed Securities on The NASDAQ Global Market. Our ability to publicly or privately sell equity securities and the liquidity of our common stock could be adversely affected if we are delisted from The NASDAQ Global Market or if we are unable to transfer our listing to another stock market.

As previously reported on our Current Report on Form 8-K filed on November 21, 2016, on November 18, 2016, we received a notice (the Notice) from The NASDAQ Stock Market LLC (NASDAQ) stating that, because we did not maintain a minimum Market Value of Listed Securities (MVLS) of $50,000,000 for the last 30 consecutive business days prior to November 18, 2016, we were no longer in compliance with NASDAQ Listing Rule 5450(b)(2)(A). The Notice had no immediate effect on the listing or trading of our common stock on The NASDAQ Global Market and the common stock continues to trade under the symbol “HSGX”.

The Notice stated that, in accordance with NASDAQ Listing Rule 5810(c)(3)(C), we have been provided a period of 180 calendar days, or until May 17, 2017, to regain compliance with the minimum MVLS listing requirement. The Notice also states that if, at any time on or before May 17, 2017, the MVLS of our common stock closes at $50,000,000 or more for a minimum of 10 consecutive business days, NASDAQ will provide the Company with written confirmation that we have achieved compliance with the minimum MVLS listing requirement and the matter will be closed.

In the event that we do not regain compliance with the minimum MVLS listing requirement on or before May 17, 2017, NASDAQ will provide us with written notification that our securities are subject to delisting. At that time, we would be permitted to appeal the delisting determination to a NASDAQ Hearings Panel or apply to transfer our common stock to The NASDAQ Capital Market (provided that we satisfy the requirements for continued listing on that market at such time).

Provisions in our amended and restated certificate of incorporation and amended and restated bylaws and Delaware law might discourage, delay or prevent a change in control of our company or changes in our management and, therefore, depress the market price of our common stock.

Our certificate of incorporation and bylaws contain provisions that could depress the market price of our common stock by acting to discourage, delay or prevent a change in control of our company or changes in our management that the stockholders of our company may deem advantageous. These provisions among other things:

- establish a classified board of directors so that not all members of our board are elected at one time;
- permit the board of directors to establish the number of directors;
- provide that directors may only be removed "for cause";
- require super-majority voting to amend some provisions in our certificate of incorporation and bylaws;
- authorize the issuance of "blank check" preferred stock that our board of directors could use to implement a stockholder rights plan;
- eliminate the ability of our stockholders to call special meetings of stockholders;
- prohibit stockholder action by written consent, which requires all stockholder actions to be taken at a meeting of our stockholders;
- provide that the board of directors is expressly authorized to make, alter or repeal our bylaws; and
- establish advance notice requirements for nominations for election to our board of directors or for proposing matters that can be acted upon by stockholders at annual stockholder meetings.

In addition, Section 203 of the Delaware General Corporation Law may discourage, delay or prevent a change in control of our company. Section 203 imposes certain restrictions on merger, business combinations and other transactions between us and holders of 15% or more of our common stock.

We are an emerging growth company and the extended transition period for complying with new or revised financial accounting standards and reduced disclosure and governance requirements applicable to emerging growth companies could make our common stock less attractive to investors.

We are an emerging growth company. Under the Jumpstart Our Business Startups Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We plan to avail ourselves of this exemption from new or revised accounting standards and, therefore, we may not be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

For as long as we continue to be an emerging growth company, we also intend to take advantage of certain other exemptions from various reporting requirements that are applicable to other public companies, including reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, exemptions from the requirements of holding a nonbinding advisory stockholder vote on executive compensation and any golden parachute payments not previously approved, exemption from the requirement of auditor attestation on our internal control over financial reporting and exemption from any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor's report providing additional information about the audit and the financial statements (auditor discussion and analysis). If we do, the information that we provide stockholders may be different than what is available with respect to other public companies.

Investors could find our common stock less attractive because we will rely on these exemptions, which may make it more difficult for investors to compare our business with other companies in our industry. 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. In addition, it may be difficult for us to raise additional capital as and when we need it. If we are unable to do so, our financial condition and results of operations could be materially and adversely affected.

We will remain an emerging growth company until the earliest of: (1) the end of the fiscal year in which the market value of our common stock that is held by non-affiliates exceeds $700.0 million as of the end of the second fiscal quarter; (2) the end of the fiscal year in which we have total annual gross revenue of $1.0 billion or more during such fiscal year; (3) the date on which we issue more than $1.0 billion in non-convertible debt in a three-year period or (4) December 31, 2019, the end of the fiscal year following the fifth anniversary of the completion of our initial public offering.

ITEM 1B. *UNRESOLVED STAFF COMMENTS*

Not applicable.

ITEM 2. *PROPERTIES*

Our corporate headquarters are currently located in Waltham, Massachusetts, for which we have a lease until December 2017, renewable for two additional five-year terms. We lease approximately 25,472 square feet of office, manufacturing and laboratory space, including 5,700 square feet of cGMP clean room space that is outfitted for NeoCart manufacturing. This facility also houses our quality staff, including quality control testing, necessary to support NeoCart manufacturing. We subleased approximately 7,310 square feet of our facility to a tenant through May 2015, at which time this space was returned for our use. The Waltham facility is expected to be adequate for a potential initial commercial launch of NeoCart in 2019.

Additionally, we lease approximately 16,601 square feet of laboratory and manufacturing space, along with related office space, in Lexington, Massachusetts. The term of the Lexington lease expires October 1, 2022 and can be extended for one additional five year period thereafter. This facility includes clean room space that will be utilized for production of our CT3 adhesive components, our collagen scaffold and the collagen raw material used to produce the scaffold and components of the CT3 adhesive. This facility also includes necessary space for quality operations, including necessary quality control testing.

Additionally, as part of the acquisition of ProChon Biotech Ltd., we leased approximately 807 square feet of office space in Tel Aviv, Israel. The term of the lease expired on March 31, 2015 and was not renewed. As part of the acquisition, we also assumed approximately 1,641 square feet of office space in Woburn, Massachusetts. This lease expired on May 30, 2016 and was not renewed.

Management believes that the leased facilities are suitable and adequate to meet our anticipated near-term needs.

ITEM 3. *LEGAL PROCEEDINGS*

From time to time, we may become subject to legal proceedings, claims and litigation arising in the ordinary course of business. We currently are not a party to any threatened or pending litigation and do not have contingency reserves established for any litigation liabilities. However, third parties might allege that we are infringing their patent rights or that we are otherwise violating their intellectual property rights, including trade names and trademarks. Such third parties may resort to litigation. We accrue contingent liabilities when it is probable that future expenditures will be made and such expenditures can be reasonably estimated.

ITEM 4. *MINE SAFETY DISCLOSURES*

Not applicable.

PART II

ITEM 5. *MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED SHAREHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES*

Our common stock has been trading on The NASDAQ Global Market (NASDAQ) under the symbol "HSGX" since our initial public offering on December 3, 2014. Prior to that time, there was no established public trading market for our common stock. The following table sets forth, for the periods indicated, the range of high and low sale prices of our common stock as reported by NASDAQ.

Year ending December 31, 2015	High	Low
First Quarter:	$12.47	$7.04
Second Quarter:	9.92	6.01
Third Quarter:	7.00	3.91
Fourth Quarter:	4.97	2.71

Year ending December 31, 2016	High	Low
First Quarter:	$ 3.60	$1.95
Second Quarter:	2.75	1.39
Third Quarter:	4.47	1.60
Fourth Quarter:	3.56	1.58

Holders

As of March 14, 2017, there were 14 holders of record of our common stock. The number of holders of record of our common stock does not reflect the number of beneficial holders whose shares are held by depositors, brokers or other nominees.

Dividends

We have not declared or paid any cash dividends on our common stock since our inception. We do not plan to pay dividends in the foreseeable future. Under our credit facility, we have agreed not to pay any dividends so long as it has any outstanding obligations thereunder. We currently intend to retain earnings, if any, to finance our growth. Consequently, stockholders will need to sell shares of our common stock to realize a return on their investment, if any.

Securities Authorized for Issuance under Equity Incentive Plans

Information regarding securities authorized for issuance under equity incentive plans will be contained in our Proxy Statement for the 2017 Annual Meeting of Stockholders to be filed with the SEC within 120 days after the end of the fiscal year ended December 31, 2016, under the captions "Equity Compensation Plan Information" and "Security Ownership of Certain Beneficial Owners and Management" and is incorporated herein by reference pursuant to General Instruction G(3) to Form 10-K.

Use of Proceeds

On December 8, 2014, we closed our IPO whereby 5,909,091 shares of common stock were sold at a public offering price of $11.00 per share for an aggregate offering price of $65.0 million. On January 6, 2015, an additional 465,000 shares of common stock were sold at the IPO price of $11.00 per share following the underwriters' exercise in part of their overallotment option (Underwriters' Option). The offer and sale of all of the shares in the IPO and pursuant to the Underwriters' Option were registered under the Securities Act pursuant to a registration statement on Form S-1 (File No. 333- 199202), which was declared effective by the SEC on

December 2, 2014. The offering commenced as of December 2, 2014 and did not terminate before all of the securities registered in the registration statement were sold. The syndicate of underwriters was led by Cowen and Company, Needham & Company and Canaccord Genuity as joint book-running managers and BTIG, LLC as co-manager. We raised approximately $61.3 million in net proceeds after deducting underwriting discounts and commissions and other offering expenses. No payments were made by us to directors, officers or persons owning ten percent or more of our common stock or to their associates, or to our affiliates, other than payments in the ordinary course of business to officers for salaries and to non-employee directors as compensation for board committee service.

There has been no material change in the planned use of proceeds from our IPO as described in our prospectus dated December 2, 2014, filed with the SEC pursuant to Rule 424(b)(4) under the Securities Act.

On September 29, 2016, we closed a private placement of common stock Series A Preferred Stock and warrants. H.C. Wainwright & Co. LLC served as the sole placement agent for the private placement. No payments were made by us to directors, officers or persons owning ten percent or more of our common stock or to their associates, or to our affiliates, other than payments in the ordinary course of business to officers for salaries and to non-employee directors as compensation for board committee service. We raised approximately $27.6 million in net proceeds after deducting placement agent and legal fees from the private placement.

ITEM 6. *SELECTED CONSOLIDATED FINANCIAL DATA*

As a smaller reporting company, we are not required to provide this information.

ITEM 7. *MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS*

The following discussion and analysis should be read in conjunction with our audited annual consolidated financial statements and the related notes that appear elsewhere in this annual report on Form 10-K. This discussion contains forward-looking statements reflecting our current expectations that involve risks and uncertainties. Actual results may differ materially from those discussed in these forward-looking statements due to a number of factors, including those set forth in the section entitled "Risk Factors" and elsewhere in this annual report on Form 10-K. For further information regarding forward-looking statements, please refer to the "Special Note Regarding Forward-Looking Statements" at the beginning of Part I of this annual report on Form 10-K.

Overview

We are a regenerative medicine company focused on developing and commercializing products in the musculoskeletal segment of the marketplace. Our first product candidate, NeoCart®, is an innovative tissue implant that utilizes various aspects of our regenerative medicine platform to treat tissue injury in the field of orthopedics, specifically cartilage damage in the knee. We are currently investigating NeoCart in a 245 patient, Phase 3 clinical trial. We have no products that are approved for sale in the United States and currently we are not selling any other products that may be approved for sale in other jurisdictions. Our regenerative medicine platform; combines expertise in the following areas:

- Cell therapy and processing: the handling of a tissue biopsy and the extraction, isolation and expansion of the cells;
- Biomaterials and Scaffold: three-dimensional biomaterials structures that enable the proper distribution of cells and organize cells in their natural environment to support tissue formation;
- Tissue engineering: the use of a combination of cells, engineering and biomaterials to improve or replace biological functions; and
- Bioadhesives: natural, biocompatible materials that act as adhesives for biological tissue and allow for natural cell and tissue infiltration and integration with native cells.

NeoCart is a cartilage-like implant created using a patient's own cartilage cells through a series of tissue engineering processes.

We have devoted substantially all of our resources to the development of our regenerative medicine platform, the preclinical and clinical advancement of our product candidates, the creation and protection of related intellectual property and the provision of general and administrative support for these operations. Prior to 2014, we generated revenue from product sales, collaboration activities and grants. We have funded our operations primarily through the private placement of preferred stock and convertible promissory notes, through commercial bank debt and the proceeds from our initial public offering.

We have never been profitable and incurred net losses in each year since inception. Our accumulated deficit was $181.8 million as of December 31, 2016. Substantially all of our net losses resulted from costs incurred in connection with our research and development programs and from general and administrative costs associated with our operations. Our net losses may fluctuate significantly from quarter to quarter and year to year. We expect to continue to incur significant expenses and operating losses in connection with our ongoing activities as we:

- conduct clinical trials of our product candidates;
- continue scale up and improvement of our manufacturing processes;
- continue with the transition of our manufacturing technology transfer;

- continue our research and development efforts;
- manufacture preclinical study and clinical trial materials;
- seek regulatory approvals for our product candidates that successfully complete clinical trials;
- prepare to commercialize NeoCart, if approved;
- hire additional clinical, quality control and technical personnel to conduct our clinical trials;
- hire additional scientific personnel to support our product development efforts;
- maintain, expand and protect our intellectual property portfolio;
- implement operational, financial and management systems associated with the potential commercialization of NeoCart, if approved; and
- hire additional general and administrative personnel to operate as a public company.

We do not expect to generate any future revenue from therapeutic product sales until we successfully complete development and obtain regulatory approval for one or more of our product candidates, which we expect will take a number of years. If we obtain regulatory approval for any of our product candidates, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. Accordingly, we will seek to fund our operations through public or private equity or debt financings or other sources. However, we may be unable to raise additional funds or enter into such other arrangements when needed on favorable terms or at all. Our failure to raise capital or enter into such other arrangements when needed would have a negative impact on our financial condition and ability to develop our product candidates.

Financial Operations Overview

We conduct operations in two geographic regions: Histogenics Corporation, a Delaware corporation, at our facilities in Waltham and Lexington, Massachusetts, and ProChon Biotech Ltd. (ProChon) in Tel Aviv, Israel. We own 100% of the voting shares of ProChon. As the nature of the products, customers and methods to distribute products are the same and the nature of the regulatory environment, the production processes and historical and estimated future margins are similar, the two operations have been aggregated into one reporting segment.

On May 13, 2011, we acquired ProChon, a privately held biotechnology company focused on modulating the fibroblast growth factor system to enable it to create more effective solutions for tissue regeneration. The acquisition of ProChon provided us with access to a portfolio of intellectual property, including proprietary cell growth factors, in addition to furthering opportunities for the use of biomaterials to create more effective solutions for regenerating human tissue.

The ProChon acquisition was accounted for as a business combination. The results of operations of ProChon have been included in our consolidated statements of operations since May 13, 2011, the date we obtained control of ProChon. Following the completion of the acquisition, ProChon became our wholly owned subsidiary and was integrated into our operations.

On September 29, 2016, we completed a private placement (the Private Placement) where we issued 2,596,059 shares of our common stock at a per share price of $2.25 and 24,158.8693 shares of our newly-created Series A Convertible Preferred Stock, which shares of preferred stock are convertible into approximately 10,737,275 shares of common stock. The Series A Convertible Preferred Stock became convertible into shares of our common stock following approval of the private placement by our stockholders in the fourth quarter of 2016. The net proceeds after deduction of placement agent fees and other transaction-related expenses was $27.6 million. As part of the Private Placement, the investors received warrants to purchase up to 13,333,334 shares of our common stock at an exercise price of $2.25 per share. The warrants include a cashless-exercise feature that may

be exercised solely in the event there is no effective registration statement registering, or no current prospectus available for, the resale of the shares of common stock underlying the warrants as of the six-month anniversary of the closing of the Private Placement. The warrants became exercisable following approval of the Private Placement by our stockholders in the fourth quarter of 2016 and expire five years after the date of such stockholder approval.

The consolidated financial statements and the following information include the accounts of Histogenics, ProChon and Histogenics Securities Corporation. All intercompany accounts and transactions have been eliminated in consolidation.

Revenue

We did not generate any revenue in 2016 or 2015 and do not expect to generate any revenue in the future until we have successfully completed the development of NeoCart and received approval from the FDA to market NeoCart or any future product candidates.

Research and Development Expenses

Research and development expenses consist of development costs associated with our regenerative medicine platform and development programs. These costs are expensed as incurred and include:

- compensation and employee-related costs;
- costs incurred under clinical trial agreements with investigative sites;
- costs to acquire, develop and manufacture preclinical study and clinical trial materials;
- costs associated with conducting our preclinical, clinical and regulatory activities, including fees paid to third-party professional consultants and service providers;
- costs for laboratory supplies and laboratory equipment;
- charges associated with the achievement of certain preclinical and financial milestones pursuant to our licenses for our bioadhesive, and our tissue engineering processor; and
- facilities, depreciation and other expenses including allocated expenses for rent and maintenance of facilities.

We plan to maintain our current level of research and development expenses for the foreseeable future as we continue the development of our regenerative medicine platform and our initial therapeutic product candidates. Our current planned research and development activities include the following:

- advancing NeoCart in the Phase 3 clinical trial;
- continued development work with Intrexon per the terms of the exclusive collaboration agreement;
- leveraging our regenerative medicine platform to expand into additional therapeutic applications; and
- expanding and protecting our intellectual property platform.

We cannot determine with certainty the timing and costs of initiation, the duration and the completion of current or future preclinical studies and clinical trials of our product candidates. At this time, due to the inherently unpredictable nature of preclinical and clinical development, we are unable to estimate with any certainty the costs we will incur and the timelines we will require in the continued development of our product candidates, including NeoCart. Clinical and preclinical development timelines, the probability of success and related development costs can differ materially from expectations. In addition, we cannot forecast which product candidates may be subject to future collaborations, when such arrangements will be secured, if at all, and to what degree such arrangements would affect our development plans and capital requirements.

We do not track research and development expenses by product. We do not allocate general equipment and supply costs, facilities, depreciation and other miscellaneous expenses to specific products as these expenses are deployed across all of our products.

General and Administrative Expenses

General and administrative expenses consist primarily of salaries and employee-related costs, including stock-based compensation and travel expenses for our employees in the executive, finance and human resource functions. Other general and administrative expenses include facility-related costs and professional fees for directors, accounting and legal services, and expenses associated with obtaining and maintaining patents.

We anticipate that our general and administrative expenses will increase in the future to support the continued research and development and potential commercialization of our product development programs as well as to maintain compliance with SEC requirements and related costs associated with being a public company.

Total Other Income (Expense), Net

Total other income (expense), net consists primarily of warrant expense for fees paid in our Private Placement; interest income earned on cash and cash equivalents; interest expense on our equipment loan; and changes in liabilities that are held at fair value.

Critical Accounting Policies and Significant Judgments and Estimates

Our management's discussion and analysis of our consolidated financial condition and results of operations are based on our consolidated financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses and the disclosure of contingent assets and liabilities in our consolidated financial statements. On an ongoing basis, we evaluate our estimates and judgments, including those related to accrued expenses and stock-based compensation. We base our estimates on historical experience, known trends and events, and various other factors that are believed to be 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. Actual results may differ from these estimates under different assumptions or conditions.

While our significant accounting policies are described in more detail in the notes to our consolidated financial statements appearing elsewhere in this annual report on Form 10-K, we believe the following accounting policies to be most critical to the significant judgments and estimates used in the preparation of our consolidated financial statements.

Income Taxes

We utilize the asset and liability method of accounting for income taxes. Under this method, deferred tax assets and liabilities are determined based on the difference between the financial statement carrying amounts and tax basis of assets and liabilities using enacted tax rates in effect for years in which temporary differences are expected to reverse. We provide a valuation allowance when it is more likely than not that deferred tax assets will not be realized. We recognize the benefit of an uncertain tax position that has been taken or we expect to take on income tax returns if such tax position is more likely than not to be sustained.

We follow the authoritative guidance regarding accounting for uncertainty in income taxes, which prescribes a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. These unrecognized tax benefits relate primarily to issues related to the timing of certain income and deductions for federal income tax purposes. We apply a variety of

methodologies in making these estimates which include advice and studies performed by independent subject matter experts, evaluation of public actions taken by the U.S. Internal Revenue Service and other taxing authorities, as well as our own industry experience. We provide estimates for unrecognized tax benefits which may be subject to material adjustments until matters are resolved with taxing authorities or statutes expire. If our estimates are not representative of actual outcomes, our results of operations could be materially impacted.

We continue to maintain a valuation allowance against our deferred tax assets due to our assessment that their realization is not certain. We periodically evaluate the likelihood of the realization of deferred tax assets and reduce the carrying amounts of these deferred tax assets by a valuation allowance to the extent we believe a portion will not be realized. We consider many factors when assessing the likelihood of future realization of deferred tax assets, including our recent cumulative earnings experience by taxing jurisdiction, expectations of future taxable income, carryforward periods available to us for tax reporting purposes, various income tax strategies and other relevant factors. Significant judgment is required in making this assessment and, to the extent future expectations change, we would assess the recoverability of our deferred tax assets at that time. If we determine that the deferred tax assets become realizable in a future period, we would record material adjustments to income tax expense that period.

Uncertain Income Tax Positions

We record uncertain tax positions on the basis of a two-step process whereby (1) we determine whether it is more likely than not that the tax positions will be sustained on the basis of the technical merits of the positions and (2) for those tax positions that meet the more-likely-than-not recognition threshold, we recognize the largest amount of tax benefit that is more than 50% likely to be realized upon ultimate settlement with the related tax authority. We recognize interest and penalties related to unrecognized tax benefits within income tax expense. Any accrued interest and penalties are included within the related tax liability. A reconciliation of the beginning and ending pre-tax amounts of uncertain tax positions is as follows:

	Tax Positions (in thousands)
Balance at December 31, 2014	$ (812)
Reductions based on tax positions related to the period	125
Balance at December 31, 2015	(687)
Reductions based on tax positions related to the period	125
Balance at December 31, 2016	$ (562)

The uncertain tax positions giving rise to the unrecognized tax benefits of $0.6 million at December 31, 2016 relate to the timing of certain income and deductions for federal income tax purposes. The reversal of unrecognized tax benefits would not have any impact on the effective tax rate in future periods and are not expected to create cash tax liability upon settlement due to our ability to utilize both pre-change and post-change NOLs to offset their impact.

Accrued Expenses

As part of the process of preparing our consolidated financial statements, we are required to estimate our accrued expenses. This process involves reviewing open contracts and purchase orders, communicating with our 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 the actual cost. The majority of our service providers invoice us monthly in arrears for services performed or when contractual milestones are met. We make estimates of our accrued expenses as of each balance sheet date in our consolidated financial statements based on facts and circumstances known to us at that

time. We periodically confirm the accuracy of our estimates with the service providers and make adjustments if necessary. Examples of estimated accrued research and development expenses include fees payable to:

- clinical research organizations and investigative sites in connection with clinical trials;
- vendors in connection with preclinical development activities;
- vendors related to product manufacturing, development, and distribution of clinical materials; and
- professional service fees for consulting and related services.

We base our expense accruals related to clinical trials on our estimates of the services received and efforts expended pursuant to our contract arrangements. The financial terms of these agreements are subject to negotiation, vary from contract to contract and may result in uneven payment flows and expense recognition. Payments under some of these contracts depend on factors such as the successful enrollment of patients and the completion of clinical trial milestones. 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 our estimate, we adjust the accrual or prepaid accordingly. 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 our reporting changes in estimates in any particular period.

Although we do not expect our estimates to be materially different from amounts actually incurred, if our estimates of the status and timing of services performed differs from the actual status and timing of services performed, we may report amounts that are too high or too low in any particular period. To date, there have been no material differences from our estimates to the amount actually incurred.

Impairment of Long-Lived Assets

Long-lived assets consist primarily of property and equipment. We test long-lived assets for impairment at year end or whenever events or circumstances present an indication of impairment. If the sum of expected future cash flows (undiscounted and without interest charges) of the long-lived assets is less than the carrying amount of such assets, an impairment loss would be recognized in earnings. The long-lived asset would be written down to the estimated fair value, calculated based on the present value of expected future cash flows. While our current negative cash flows are indicators of impairment, we believe that future cash flows to be received support the carrying value of our long-lived assets.

Impairment of Intangible Assets

We test intangible assets for impairment at year end or whenever events or circumstances present an indication of impairment. If the sum of expected future cash flows (undiscounted and without interest charges) of the intangible assets is less than the carrying amount of such assets, an impairment loss would be recognized in earnings in “impairment of goodwill and intangible assets.” The intangible assets would be written down to the estimated fair value, calculated based on the present value of expected future cash flows. Our intangible assets consisted of in-process research and development (IPR&D) obtained through the acquisition of ProChon and the AT Grade license. The results of our annual impairment test as of December 31, 2015, indicated a decline in the fair market value of the IPR&D, resulting in an impairment charge of $0.3 million for 2015. For year ended December 31, 2016, we deemed the value of the IPR&D to be zero as we have no plans to advance the technology or use it in any future clinical development activities. The result was a write-off of $0.2 million. IPR&D is now fully impaired.

Stock-Based Compensation

We account for grants of stock options and restricted stock based on their grant date fair value and recognize compensation expense over their vesting period. We estimate the fair value of stock options as of the date of

grant using the Black-Scholes option pricing model and, if issued, restricted stock based on the fair value of the underlying common stock as determined by management or the value of the services provided, whichever is more readily determinable.

Stock-based compensation expense represents the cost of the grant date fair value of employee stock option grants recognized over the requisite service period of the awards (usually the vesting period) on a straight-line basis, net of estimated forfeitures. The expense is adjusted for actual forfeitures at year end. Stock-based compensation expense recognized in the financial statements is based on awards that are ultimately expected to vest.

The Black-Scholes option pricing model requires us to make certain assumptions and estimates concerning our stock price volatility, the rate of return of risk-free investments, the expected term of the awards, and our anticipated dividends. We utilize the volatility from an analysis of peer group companies used in the Black-Scholes model, as we do not believe we have sufficient historical data to support this assumption.

We account for stock options and restricted stock awards to non-employees using the fair value approach. Stock options and restricted stock awards granted to non-employees are subject to periodic revaluation over their vesting terms.

Other Company Information

JOBS Act

On April 5, 2012, the Jumpstart Our Business Startups Act (JOBS Act) was enacted. Section 107 of the JOBS Act permits an “emerging growth company” to delay the adoption of new or revised accounting standards until those standards would otherwise apply to private companies. We plan to avail ourselves of this exemption from new or revised accounting standards and, therefore, we may not be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

For so long as we are an “emerging growth company,” we intend to rely on exemptions relating to: (1) providing an auditor’s attestation report on our system of internal control over financial reporting pursuant to Section 404(b) of the Sarbanes-Oxley Act and (2) complying with any requirement that may be adopted by the Public Company Accounting Oversight Board regarding mandatory audit firm rotation or a supplement to the auditor’s report providing additional information about the audit and the financial statements, known as the auditor discussion and analysis. We will remain an emerging growth company until the earliest of (a) the last day of the fiscal year in which we have total annual gross revenue of $1.0 billion or more, (b) December 31, 2019, the last day of our fiscal year following the fifth anniversary of the date of the completion of our initial public offering, (c) the date on which we have issued more than $1.0 billion in non-convertible debt during the previous three years and (d) the date on which we are deemed to be a large accelerated filer under the rules of the SEC.

Net Operating Loss Carryforwards

Utilization of the net operating loss (NOL) and research and development credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred or that could occur in the future, as required by Section 382 and 383 of the Internal Revenue Code (Code), as well as similar state and foreign provisions. These ownership changes may limit the amount of NOL and research and development credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an “ownership change” as defined by Section 382 of the Code results from a transaction or series of transactions over a three-year period resulting in an ownership change of more than 50% of the outstanding stock of a company by certain stockholders. We have completed a study to assess whether an ownership change has occurred or whether there have been multiple ownership changes since our formation. The results of this study indicated we experienced ownership changes, as defined by Section 382 of the Code, in each of 2006, 2011,

2012, 2013 and 2016. We have not recorded NOLs that as a result of these restrictions will expire unused. The limitations are $3.9 million, $30.5 million, $36.7 million, $47.2 million, $47.2 million, $47.2 million and $100.1 million in 2010, 2011, 2012, 2013, 2014, 2015 and 2016 respectively.

As of December 31, 2016, and 2015, we had U.S. federal NOL carryforwards of $24.5 million and $55.5 million respectively, which may be available to offset future income tax liabilities and expire at various dates through 2036. As of December 31, 2016, and 2015, we also had U.S. state NOL carryforwards of $24.3 million and $55.4 million, respectively, which may be available to offset future income tax liabilities and expire at various dates through 2036. At December 31, 2016 and 2015, we also had $26.1 million and $25.6 million, respectively, of foreign NOL carryforwards which may be available to offset future income tax liabilities, which carryforwards do not expire.

As of December 31, 2016, we have provided a full valuation allowance for deferred tax assets.

Recently Adopted Accounting Pronouncements

In November 2015, the Financial Accounting Standards Board (the FASB) issued Accounting Standards Update (ASU) No. 2015-17, Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes. The new standard requires that deferred tax assets and liabilities be classified as noncurrent in a classified statement of financial position. We adopted this standard as of December 31, 2015, with prospective application. As a result, we reclassified our deferred tax assets classified as current to noncurrent and our deferred tax liabilities classified as current to noncurrent in our December 31, 2015 consolidated balance sheet.

In November 2014, the FASB issued ASU 2014-16, Derivatives and Hedging (Topic 815): Determining Whether the Host Contract in a Hybrid Financial Instrument Issued in the Form of a Share Is More Akin to Debt or to Equity. This standard provides guidance to eliminate the existing diversity in practice in accounting for hybrid financial instruments issued in the form of a share. A hybrid financial instrument consists of a “host contract” into which one or more derivative terms have been embedded. This guidance requires an entity to consider the terms and features of the entire financial instrument, including the embedded derivative features, in order to determine whether the nature of the host contract is more akin to debt or to equity. This guidance is effective for fiscal years and interim periods beginning after December 15, 2015, with early adoption permitted. A reporting entity should apply this guidance using a modified retrospective approach by recording a cumulative-effect adjustment to equity as of the beginning of the annual period of adoption. Retrospective application is permitted to all relevant prior periods. We have concluded that this guidance has no impact on the presentation of our results of operations, financial position and disclosures.

In August 2014, the FASB issued ASU No. 2014-15, Presentation of Financial Statements—Going Concern (Subtopic 2015-40): Disclosure of Uncertainties about an Entity’s Ability to Continue as a Going Concern. This guidance addresses management’s responsibility in evaluating whether there is substantial doubt about a company’s ability to continue as a going concern and to provide related footnote disclosures. The guidance is effective for fiscal years ending after December 15, 2016 and for interim periods within those fiscal years. The adoption of this standard did not have a material impact on our consolidated financial statements and related disclosures.

In June 2014, the FASB issued ASU No. 2014-12, Compensation-Stock Compensation (Topic 718): Accounting for Share-Based Payments When the Terms of an Award Provide That a Performance Target Could be Achieved after the Requisite Service Period. This standard provides guidance requiring when there is a performance target that affects vesting of equity awards granted and could be achieved after the requisite service period to be treated as a performance condition. A reporting entity should apply existing guidance on stock-based compensation, as it relates to such awards. This guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2015 with early adoption permitted using either of two methods: (i) prospective to all awards granted or modified after the effective date; or (ii) retrospective to all awards with

performance targets that are outstanding as of the beginning of the earliest annual period presented in the financial statements and to all new or modified awards thereafter, with the cumulative effect of applying this guidance as an adjustment to the opening retained earnings balance as of the beginning of the earliest annual period presented in the financial statements. We issued performance-based awards during the year ended December 31, 2015. We adopted this guidance on a prospective basis and there have not been any performance-based awards since the effective date of the guidance.

Recently Issued Accounting Pronouncements

In November 2016, the FASB issued guidance that requires restricted cash and restricted cash equivalents be included with cash and cash equivalents when reconciling the total beginning and ending amounts for the periods shown on the statement of cash flows. The new standard is effective for us on January 1, 2018 using a retrospective transition method to each period presented. Early adoption is permitted. We are currently evaluating the timing of our adoption and the expected impact that this standard could have on our consolidated financial statements and related disclosures.

In March 2016, the FASB issued ASU No. 2016-09, Compensation-Stock Compensation (Topic 718): Improvements to Employee Shared-Based Payment Accounting. This standard provides guidance on accounting for employee share-based payments. This guidance addresses several aspects of the accounting for share-based payment award transactions, including: (a) income tax consequences; (b) classification of awards as either equity or liabilities; and (c) classification on the statement of cash flows. This standard will be effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years. We are evaluating the impact of this guidance on the presentation of our results of operations, financial position and disclosures.

In February 2016, the FASB, issued ASU No. 2016-02- *Leases (Topic 842)*. This requires companies to recognize on the balance sheet the assets and liabilities for the rights and obligations created by leased assets. ASU 2016-02 will be effective for us in the first quarter of 2019, with early adoption permitted. We are currently evaluating the impact that the adoption of ASU 2016-02 will have on our consolidated financial statements or related disclosures.

In May 2014, the FASB issued guidance that affect any entity that either enters into contracts with customers to transfer goods or services or enters into contracts for the transfer of nonfinancial assets unless those contracts are within the scope of other standards (e.g., insurance contracts or lease contracts). The core principle of the guidance is that an entity should recognize revenue to depict the transfer of promised goods or services to customers in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. The amendments are effective for annual reporting periods beginning after December 15, 2016, including interim periods within that reporting period. Early application is not permitted. We have not had any revenue from contracts with customers through December 31, 2016. Our adoption of this guidance is not expected to have a material impact on our consolidated financial statements.

Results of Operations

Years Ended December 31, 2016 and 2015

The following table summarizes the results of our operations for the years ended December 31, 2016 and 2015:

	December 31,		Change	
	2016	2015	$	%
	(in thousands)			
Research and development expenses	$21,577	$23,243	$ (1,666)	(7)%
General and administrative expenses	8,530	8,266	264	3
Impairment of goodwill and intangible assets	200	310	(110)	(35)
Other (expense), net	14,099	(205)	14,304	(6,978)

Revenue. We did not record any revenue for the years ended December 31, 2016 and 2015. We do not expect to generate any revenue in the future until we have successfully completed the development of NeoCart and received approval from the FDA to market NeoCart or any future product candidates.

Research and Development Expenses. Research and development expenses were $21.6 million for the year ended December 31, 2016 as compared to $23.2 million for the year ended December 31, 2015. The decrease in research and development expenses of $1.7 million was primarily due to a reduction in consulting expenses of $1.6 million, a reduction in raw materials expense of $0.8 million due to purchases made in 2015 of raw materials to support our ongoing Phase 3 clinical trial that were not repeated in 2016, and a reduction in patient recruitment costs of $0.6 million, and was partially offset by an increase of approximately $1.2 million due to higher patient enrollment in the NeoCart Phase 3 clinical trial.

General and Administrative Expenses. General and administrative expenses were $8.5 million for the year ended December 31, 2016 as compared to $8.3 million for the year ended December 31, 2015. The increase in expense of $0.3 million was primarily due to an increase in personnel related costs of approximately $0.5 million, an increase of approximately $0.3 million related to stock-based compensation expense from new option grants and an increase of $0.2 million of facility-related expenses, partially offset by a decrease of $0.7 million in professional and consulting expenses.

Impairment of Intangible Assets. Impairment of intangible assets was $0.2 million and $0.3 million for the years ended December 31, 2016 and 2015, respectively. Impairments of IPR&D were identified during our annual impairment testing for the years ended December 31, 2016 and 2015, respectively. The underlying IPR&D is a secondary asset to our core product NeoCart, which receives virtually all of our development and commercialization efforts. As a result, we recorded the necessary reduction in the value IPR&D resulting in the complete write-off of the asset. During the fourth quarter of 2016, we deemed the value of the IPR&D to be zero for the year ended December 31, 2016 as we have no plans to advance the technology or use it in any future clinical development activities. The result was a write-off of $0.2 million.

Other Income (Expense), Net. Other income (expense), net was $14.1 million for the year ended December 31, 2016, compared to ($0.2) million for the year ended December 31, 2015. The $14.3 million change from other (expense) to other income was primarily due to the periodic fair value adjustment of warrant liability of $17.5 million partially offset by costs incurred of $3.1 million in conjunction with the Private Placement in September 2016.

Liquidity and Capital Resources

Through December 31, 2016, we had an accumulated deficit of $181.8 million and anticipate that we will continue to incur net losses for the next several years.

Through December 31, 2016, we have funded our consolidated operations primarily through the proceeds of our initial public offering, private placement of preferred stock and convertible notes and commercial bank debt. As of December 31, 2016, we had cash and cash equivalents of $31.9 million.

We believe our existing cash and cash equivalents will be sufficient to fund our projected cash needs into the middle of 2018 and we have the ability to reduce or defer operating expenses as may be needed to fund our operations into the middle of the third quarter of 2018. We will require additional capital for the further development and commercialization activities of our existing product candidates.

The following table sets forth a summary of the net cash flow activity for each of the periods indicated:

	December 31,		Change	
	2016	2015	$	%
	(in thousands)			
Net cash used in operating activities	$(25,736)	$(30,034)	$ 4,298	(14)%
Net cash used in investing activities	(320)	(1,949)	1,629	(84)
Net cash provided by financing activities	27,049	4,371	22,678	519
Net increase (decrease) in cash and cash equivalents	$ 993	$(27,612)	$28,605	(104)%

Operating Capital Requirements

We anticipate that we will continue to incur losses for the next several years, and we expect the losses to increase as we continue the development of, and seek regulatory approvals for NeoCart and our future product candidates, and begin to commercialize any approved products. We are subject to all risks incident to the development of new therapeutic products, and we may encounter unforeseen expenses, difficulties, complications, delays and other unknown factors that may adversely affect our business. We have incurred additional costs associated with operating as a public company. We anticipate that we will need substantial additional funding in connection with our continuing operations.

Until we can generate a sufficient amount of revenue from our regenerative medicine products, if ever, we expect to finance future cash needs through public or private equity or debt offerings. Additional capital may not be available on reasonable terms, if 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. If we raise additional funds through the issuance of additional debt or equity securities, it could result in dilution to our existing stockholders, increased fixed payment obligations and the existence of securities with rights that may be senior to those of our common stock. If we incur indebtedness, we could become subject to covenants that would restrict our operations and potentially impair our competitiveness, such as limitations on our ability to incur additional debt, limitations on our ability to acquire, sell or license intellectual property rights and other operating restrictions that could adversely impact our ability to conduct our business. Any of these events could significantly harm our business, financial condition and prospects.

Our forecast of the period of time through which our financial resources will be adequate to support our operations is a forward-looking statement and involves risks and uncertainties, and actual results could vary as a result of a number of factors. We have based this estimate on assumptions that may prove to be wrong, and we could utilize our available capital resources sooner than we currently expect. The amount and timing of future funding requirements, both near- and long-term, will depend on many factors, including:

- the design, initiation, progress, size, timing, costs and results of preclinical studies and clinical trials for our product candidates;
- the outcome, timing and cost of regulatory approvals by the U.S. Food and Drug Administration (FDA) and comparable foreign regulatory authorities, including the potential for the FDA or comparable foreign regulatory authorities to require that we perform more studies than, or evaluate clinical endpoints other than those that we currently expect;
- the timing and costs associated with our manufacturing technology transfer;
- the timing and costs associated with manufacturing NeoCart and our future product candidates for clinical trials, preclinical studies and, if approved, for commercial sale;
- the cost of establishing sales, marketing and distribution capabilities for NeoCart, or any products for which we may receive regulatory approval;

- the number and characteristics of product candidates that we pursue;
- the extent to which we are required to pay milestone or other payments under our in-license agreements and the timing of such payments;
- the cost of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights;
- our need to expand our research and development activities, including our need and ability to hire additional employees;
- our need to implement additional infrastructure and internal systems and hire additional employees to operate as a public company and prepare to support the commercialization of NeoCart, if approved; and
- the effect of competing technological and market developments.

If we cannot expand our operations or otherwise capitalize on our business opportunities because we lack sufficient capital, our business, financial condition and results of operations could be materially adversely affected.

Operating Activities

Cash used in operating activities decreased $4.3 million to $25.7 million for the year ended December 31, 2016 from $30.0 million for the year ended December 31, 2015. During the year ended December 31, 2016, the net cash used for operating activities of $25.7 million consisted primarily of our net loss of $16.0 million adjusted for non-cash items including: the decrease in fair value of warrants of $17.5 million, $3.1 million in warrant expense, $1.7 million in depreciation expense, a $2.0 million increase in operating assets and liabilities, $1.5 million in stock-based compensation expense, a $0.5 million decrease in deferred rent and lease incentive, and $0.2 million related to the impairment of intangible assets. During the year ended December 31, 2015, the net cash used for operating activities of $30.0 million consisted primarily of our net loss of $32.0 million adjusted for non-cash items including: $1.6 million in depreciation expense, $1.2 million in stock-based compensation expense, a $0.8 million decrease in operating assets and liabilities, a $0.3 million decrease in deferred rent and lease incentive and $0.3 million related to the impairment of intangible assets.

Investing Activities

Cash used in investing activities decreased $1.6 million to $0.3 million for the year ended December 31, 2016 from $1.9 million for the year ended December 31, 2015. The difference was primarily related to a reduction in purchases of property and equipment.

Financing Activities

Cash provided by financing activities increased $22.7 million to $27.0 million for the year ended December 31, 2016 from $4.4 million for the year ended December 31, 2015. During the year ended December 31, 2016, we received net proceeds of $27.6 million from the Private Placement, partially offset by the payment on our equipment term loan of $0.6 million. During the year ended December 31, 2015, we received net proceeds of $4.7 million from the partial exercise of the underwriters' overallotment option as part of our initial public offering, partially offset by the payment on our equipment line of credit of $0.4 million.

Loan and Security Agreements

Equipment Loan

In July 2014, we entered into a loan and security agreement with Silicon Valley Bank, which provides for a line of credit to finance certain equipment purchases up to an aggregate of $1.75 million through March 31, 2015.

The line has been fully drawn and is payable in 36 monthly installments of principal and interest commencing six months following the date of the draw with an annual interest rate of 2.75% plus the greater of 3.25% and the prime rate in effect at the time of each draw, as published in the Wall Street Journal. The outstanding balance on the line of credit is secured by a first priority lien over all equipment purchased using the line of credit.

In accordance with the terms of the equipment line of credit, we issued a warrant to Silicon Valley Bank in July 2014 to purchase 6,566 shares of our common stock at an exercise price per share of $7.99.

The equipment line of credit includes customary operating but non-financial covenants, including limitations on our ability to incur additional indebtedness, issue dividends, sell assets, engage in any business other than our current business, merge or consolidate with other entities, create liens on our assets, make investments, repurchase our stock in certain instances, enter into transactions with affiliates, make payments on subordinated indebtedness and transfer or encumber any collateral securing the debt. As of December 31, 2016 and 2015, $0.8 million and $1.3 million, respectively, of borrowings were outstanding under the line of credit and we were in compliance with all required covenants.

Off-Balance Sheet Arrangements

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

ITEM 7A. QUALITATIVE AND QUANTITATIVE DISCLOSURES ABOUT MARKET RISK

Not applicable.

ITEM 8. FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

The consolidated financial statements and related consolidated financial statement schedules required to be filed are indexed on page 97 and are incorporated herein.

ITEM 9. CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A. CONTROLS AND PROCEDURES

Conclusion Regarding the Effectiveness of Disclosure Controls and Procedures

Our management, with the participation of our Chief Executive Officer and our Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2016. The term “disclosure controls and procedures,” as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC’s rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company’s management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of December 31, 2016, our Chief Executive Officer and Chief Financial Officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate "internal control over financial reporting" for the Company, as that term is defined in Rule 13a-15(f) and Rule 15d-15(f) under the Exchange Act. Our internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of our consolidated financial statements for external purposes in accordance with U.S. generally accepted accounting principles. Internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the company's assets that could have a material effect on the financial statements.

Under the supervision and with the participation of our management, including our Chief Executive Officer and Chief Financial Officer, we have conducted an evaluation of the effectiveness of our internal control over financial reporting based upon the criteria established in *Internal Control—Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission. Based on this evaluation, our management has concluded that our internal control over financial reporting was effective as of December 31, 2016 to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with U.S. generally accepted accounting principles.

Because of its inherent limitations, a system of internal control over financial reporting can provide only reasonable assurances and may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with policies and procedures may deteriorate.

Changes in Internal Control over Financial Reporting

There has been no change in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) of the Exchange Act) during the fourth quarter of 2016 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Limitations on the Effectiveness of Controls

Control systems, no matter how well conceived and operated, are designed to provide a reasonable, but not an absolute, level of assurance that the objectives of the control system are met. Further, the design of a control system must reflect the fact that there are resource constraints, and the benefits of controls must be considered relative to their costs. Because of the inherent limitations in all control systems, no evaluation of controls can provide absolute assurance that all control issues and instances of fraud, if any, have been detected. Because of the inherent limitations in any control system, misstatements due to error or fraud may occur and not be detected.

ITEM 9B. ***OTHER INFORMATION***

None.

PART III

ITEM 10. *DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE*

The information required by this item regarding our directors, including the audit committee and audit committee financial experts, and executive officers corporate governance, our code of conduct and compliance with Section 16(a) of the Exchange Act will be included in our Proxy Statement for the 2017 Annual Meeting of Stockholders to be filed with the Securities and Exchange Commission within 120 days of fiscal year ended December 31, 2016 (2017 Proxy Statement) and is incorporated herein by reference.

ITEM 11. *EXECUTIVE COMPENSATION*

The information required by this item regarding executive compensation will be included in our 2017 Proxy Statement and is incorporated herein by reference.

ITEM 12. *SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS*

Information required by this item regarding security ownership of certain beneficial owners and management will be included in our 2017 Proxy Statement and is incorporated herein by reference.

ITEM 13. *CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE*

The information required by this item regarding certain relationships and related transactions and directors independence will be included in our 2017 Proxy Statement and is incorporated herein by reference.

ITEM 14. *PRINCIPAL ACCOUNTANT FEES AND SERVICES*

The information required by this item regarding principal accounting fees and services will be included in our 2017 Proxy Statement and is incorporated herein by reference.

PART IV

ITEM 15. *EXHIBITS AND FINANCIAL STATEMENTS SCHEDULES*

(a) The following documents are filed as part of, or incorporated by reference into, this annual report on Form 10-K:

1. *Financial Statements*. See Index to Consolidated Financial Statements under Item 8 of this annual report on Form 10-K.
2. *Financial Statement Schedules*. All schedules have been omitted because the information required to be presented in them is not applicable or is shown in the consolidated financial statements or related notes.
3. *Exhibits*. We have filed, or incorporated into this annual report on Form 10-K by reference, the exhibits listed on the accompanying Exhibit Index immediately following the consolidated financial statements of this annual report on Form 10-K.

(b) *Exhibits*. See Item 15(a)(3) above.

(c) *Financial Statement Schedules*. See Item 15(a)(2) above.

ITEM 16. *FORM 10-K SUMMARY*

Not applicable.

Signatures

Pursuant to the requirements of Section 13 and 15(d) of the Securities Exchange Act of 1934, as amended, the registrant has duly caused this annual report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Waltham, Commonwealth of Massachusetts, on March 16, 2017.

HISTOGENICS CORPORATION

By: /s/ Adam Gridley
Adam Gridley,
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1934, this annual report on Form 10-K has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ Adam Gridley **Adam Gridley**	Chief Executive Officer, President and Director (Principal Executive Officer)	March 16, 2017
/s/ Jonathan Lieber **Jonathan Lieber**	Chief Financial Officer (Principal Financial and Accounting Officer)	March 16, 2017
/s/ Garheng Kong, M.D., Ph.D. **Garheng Kong, M.D., Ph.D.**	Chairman of the Board of Directors	March 16, 2017
/s/ Joshua Baltzell **Joshua Baltzell**	Director	March 16, 2017
/s/ David Gill **David Gill**	Director	March 16, 2017
/s/ John H. Johnson **John H. Johnson**	Director	March 16, 2017
/s/ Michael Lewis **Michael Lewis**	Director	March 16, 2017
/s/ Kevin Rakin **Kevin Rakin**	Director	March 16, 2017

Histogenics Corporation

Index to the Consolidated Financial Statements

Report of Independent Registered Public Accounting Firm

Board of Directors and Shareholders

Histogenics Corporation

We have audited the accompanying consolidated balance sheets of Histogenics Corporation (a Delaware corporation) and subsidiaries (the “Company”) as of December 31, 2016 and 2015, and the related consolidated statements of operations, convertible preferred stock and stockholders’ equity, and cash flows for each of the two years in the period ended December 31, 2016. 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 conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. We were not engaged to perform an audit of the Company’s internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company’s internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Histogenics Corporation and subsidiaries as of December 31, 2016 and 2015, and the results of their operations and their cash flows for each of the two years in the period ended December 31, 2016 in conformity with accounting principles generally accepted in the United States of America.

/s/ GRANT THORNTON LLP

Boston, Massachusetts
March 16, 2017

Histogenics Corporation

Consolidated Balance Sheets
(In thousands, except share and per share data)

	December 31, 2016	December 31, 2015
ASSETS		
Current assets:		
Cash and cash equivalents	$ 31,908	$ 30,915
Prepaid expenses and other current assets	173	321
Total current assets	32,081	31,236
Property and equipment, net	3,860	5,213
Intangible asset, net	—	200
Restricted cash	137	137
Total assets	$ 36,078	$ 36,786
LIABILITIES AND STOCKHOLDERS' EQUITY		
Current liabilities:		
Accounts payable	$ 1,588	$ 2,024
Accounts payable due to Intrexon Corporation	360	229
Accrued expenses	2,097	1,444
Accrued expenses due to Intrexon Corporation	—	1,546
Current portion of deferred rent	136	126
Current portion of deferred lease incentive	407	407
Current portion of equipment loan	583	583
Total current liabilities	5,171	6,359
Accrued expenses due to Intrexon Corporation	3,040	—
Deferred rent, long-term	315	451
Deferred lease incentive, long-term	610	1,017
Equipment loan, long-term	178	761
Warrant liability	13,197	—
Total liabilities	22,511	8,588
Commitments and contingencies (Note 7)		
Convertible preferred stock and stockholders' equity:		
Convertible preferred stock, $0.01 par value; 30,000,000 shares authorized, 13,416.4734 and 0 shares issued and outstanding at December 31, 2016 and 2015, respectively	—	—
Common stock, $0.01 par value; 100,000,000 shares authorized, 20,647,612 and 13,273,470 shares issued and outstanding at December 31, 2016 and 2015, respectively	159	132
Additional paid-in capital	195,181	193,631
Accumulated deficit	(181,773)	(165,565)
Total stockholders' equity	13,567	28,198
Total liabilities and stockholders' equity	$ 36,078	$ 36,786

The accompanying notes are an integral part of these consolidated financial statements.

Histogenics Corporation

Consolidated Statements of Operations
(In thousands, except share and per share data)

	Year Ended December 31,	
	2016	2015
Revenue	$ —	$ —
Operating expenses:		
Research and development	21,577	23,243
General and administrative	8,530	8,266
Impairment of intangible asset	200	310
Total operating expenses	30,307	31,819
Loss from operations	(30,307)	(31,819)
Other income (expense):		
Interest expense, net	(60)	(133)
Other expense, net	(248)	(72)
Warrant expense	(3,100)	—
Change in fair value of warrant liability	17,507	—
Total other income (expense), net	14,099	(205)
Net loss	$ (16,208)	$ (32,024)
Loss attributable to common stockholders—basic	$ (13,863)	$ (32,024)
Loss attributable to common stockholders—diluted	$ (31,370)	$ (32,024)
Loss per common share—basic	$ (0.97)	$ (2.42)
Loss per common share—diluted	$ (2.18)	$ (2.42)
Weighted-average shares used to compute loss per common share—basic	14,256,954	13,231,126
Weighted-average shares used to compute loss per common share—diluted	14,389,192	13,231,126

The accompanying notes are an integral part of these consolidated financial statements.

Histogenics Corporation

Consolidated Statements of Convertible Preferred Stock and Stockholders' Equity
(In thousands, except share and per share data)

	Series A Convertible Preferred Stock $0.01 Par Value		Common Stock $0.01 Par Value		Restricted Stock $0.01 Par Value		Additional Paid-In Capital	Accumulated Deficit	Total Stockholders Equity
	Shares	Amount	Shares	Amount	Shares	Amount			
Balance at December 31, 2014	—	$ —	12,746,519	$ 127	8,493	$ —	$ 187,620	$ (133,541)	$ 54,206
Issuance of common stock from overallotment, net of underwriting fees and issuance costs of $377	—	—	465,000	5	—	—	4,733	—	4,738
Issuance of warrant as part of the consideration for the consulting related to financial support services in March 2015	—	—	—	—	—	—	11	—	11
Vesting of restricted stock			3,303	—	(3,303)	—	—	—	—
Stock-based compensation expense	—	—	—	—	—	—	1,228	—	1,228
Exercise of common stock options			53,458	—	—	—	39	—	39
Net loss	—	—	—	—	—	—	—	(32,024)	(32,024)
Balance at December 31, 2015	—	—	13,268,280	132	5,190	—	193,631	(165,565)	28,198
Stock-based compensation expense	—	—	—	—	—	—	1,548		1,548
Exercise of common stock options	—	—	3,685	1	—	—	2	—	3
Vesting of restricted stock	—	—	3,301	—	(3,301)	—	—	—	—
Issuance of common stock related to private placement	—	—	2,596,059	26	—	—	—	—	26
Issuance of Series A convertible preferred stock	24,159	—	—	—	—	—	—	—	—
Conversion of Series A convertible preferred stock	(10,743)	—	4,774,398	—	—	—	—	—	—
Net loss	—	—	—	—	—	—	—	(16,208)	(16,208)
Balance at December 31, 2016	13,416	$ —	20,645,723	$ 159	1,889	$ —	$ 195,181	$ (181,773)	$ 13,567

The accompanying notes are an integral part of these consolidated financial statements.

Histogenics Corporation

Consolidated Statements of Cash Flows
(In thousands, except share and per share data)

	Year Ended December 31,	
	2016	2015
CASH FLOWS FROM OPERATING ACTIVITIES:		
Net loss	$ (16,208)	$ (32,024)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	1,673	1,614
Deferred rent and lease incentive	(533)	(322)
Impairment of intangible asset	200	310
Stock-based compensation	1,548	1,228
Change in fair value of warrant	(17,507)	—
Warrant expense in connection with private placement	3,100	11
Changes in operating assets and liabilities:		
Prepaid expenses and other current assets	148	475
Accrued expenses due to Intrexon Corporation	1,494	1,539
Accounts payable	(435)	(2,844)
Accounts payable due to Intrexon Corporation	131	211
Accrued expenses	653	(232)
Net cash used in operating activities	(25,736)	(30,034)
CASH FLOWS FROM INVESTING ACTIVITIES:		
Purchases of property and equipment	(320)	(1,949)
Net cash used in investing activities	(320)	(1,949)
CASH FLOWS FROM FINANCING ACTIVITIES:		
Proceeds from issuance of common stock, preferred stock, and warrants in connection with private placement, net of issuance costs	27,630	—
Proceeds from overallotment, net of issuance costs of $377	—	4,738
Repayments on equipment term loan	(583)	(406)
Proceeds from exercise of stock options	2	39
Net cash provided by financing activities	27,049	4,371
Net increase (decrease) in cash and cash equivalents	993	(27,612)
Cash and cash equivalents—Beginning of period	30,915	58,527
Cash and cash equivalents—End of period	$ 31,908	$ 30,915
Supplemental Disclosure of Non-Cash Items:		
Fair market value of private placement warrants at issuance	$ 30,704	$ —
Supplemental Disclosure of Cash Flow information:		
Cash paid for taxes	$ 257	$ 79
Cash paid for interest	$ 66	$ 94

The accompanying notes are an integral part of these consolidated financial statements.

Histogenics Corporation

Notes to Consolidated Financial Statements

1. NATURE OF BUSINESS

Organization

Histogenics Corporation (the "Company") was incorporated under the laws of the Commonwealth of Massachusetts on June 28, 2000 and has its principal operations in Waltham, Massachusetts. In 2006, the Company's board of directors approved a corporate reorganization pursuant to which the Company incorporated as a Delaware corporation. The Company is a regenerative medicine company engaged in developing and commercializing products in the musculoskeletal segment of the marketplace. The Company combines cell therapy and tissue engineering technologies to develop products for tissue repair and regeneration and is initially focused on patients suffering from cartilage-derived pain and immobility. The Company's most advanced product, NeoCart, is currently in a Phase 3 clinical trial in the United States (the "U.S.") under a special protocol assessment with the U.S. Food and Drug Administration ("FDA") for the treatment of knee cartilage damage.

On May 13, 2011, the Company completed the acquisition of ProChon Biotech Ltd. ("ProChon"), a privately-held biotechnology company focused on modulating the fibroblast growth factor system for consideration of $2.2 million to enable it to create more effective solutions for tissue regeneration. ProChon's products combine cell regeneration technologies with proprietary growth factors and biocompatible scaffolds to restore injured or chronically damaged tissues. The acquisition of ProChon provided the Company with access to a significant portfolio of intellectual property, including proprietary cell growth factors, in addition to furthering opportunities for the use of biomaterials to create more effective solutions for regenerating human tissue. The acquisition led to the initial recognition of goodwill, which was subsequently written off in 2011, and intangible assets including IPR&D and a licensing agreement which have been impaired as discussed in Note 2.

On December 18, 2014, the Company formed a wholly owned subsidiary, Histogenics Securities Corporation, under the laws of the Commonwealth of Massachusetts.

On September 29, 2016, the Company closed a private placement of common stock, preferred stock and warrants, contemplated by a securities purchase agreement dated September 15, 2016, with certain institutional and accredited investors. The net proceeds after deducting placement agent fees and other transaction-related expenses was $27.6 million. See Note 8, Capital Stock, for further discussion of the private placement.

Since its inception, the Company has devoted substantially all of its efforts to product development, recruiting management and technical staff, raising capital, starting up production and building infrastructure and has not yet generated revenues from its planned principal operations. Expenses have primarily been for research and development and related administrative costs.

The Company is subject to a number of risks. The developmental nature of its activities is such that significant inherent risks exist in the Company's operations. Principal among these risks are the successful development of therapeutics, successfully enrolling patients in its clinical trials in a timely manner, obtaining regulatory approval for any of its product candidates in any jurisdiction, compliance with government regulations, ability to obtain adequate financing, protection of proprietary therapeutics, fluctuations in operating results, dependence on key personnel and collaborative partners, adoption of the Company's products by the physician community, rapid technological changes inherent in the markets targeted, and substitute products and competition from larger companies.

The consolidated financial statements have been prepared on a going-concern basis, which contemplates the realization of assets and the satisfaction of liabilities in the normal course of business. As shown in the accompanying consolidated financial statements, the Company has incurred losses and cash flow deficits from

operations for the years ended December 31, 2016 and 2015. The Company has financed operations to date primarily through private placements of equity securities, including the sale of common stock and preferred stock, and the related issuance of warrants in September 2016, the issuance of common stock in the initial public offering completed in December 2014, and borrowings under debt agreements. The Company has incurred losses and negative cash flows from operations since inception resulting in an accumulated deficit at December 31, 2016 of $181.8 million. The Company anticipates that it will continue to incur net losses for the next several years. The Company believes that its existing cash and cash equivalents will be sufficient to fund its projected cash needs into the middle of 2018, and it has the ability to reduce or defer operating expenses as may be needed to fund its operations into the middle of the third quarter of 2018. The Company will require additional capital to complete the filing of a biologics license application with the FDA and commercialize NeoCart, if approved, and for the future development of its existing product candidates. However, the terms of such financing may not be on favorable terms or available to the Company.

Initial public offering

On December 3, 2014, the Company completed its initial public offering ("IPO") whereby the Company sold 5,909,091 shares of common stock at a price of $11.00 per share. The shares began trading on the Nasdaq Global Market on December 3, 2014. Gross proceeds from the offering were $65 million. In January 2015, the underwriters exercised a portion of their overallotment option and purchased an additional 465,000 shares of the Company's common stock at $11.00 per share, resulting in an additional $5.1 million in gross proceeds. After giving effect to underwriting discounts and commissions and offering expenses payable by the Company, net proceeds were $61.3 million.

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

Basis of Accounting

The consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP"). The consolidated financial statements include the accounts of Histogenics Corporation and its wholly-owned subsidiaries, ProChon and Histogenics Securities Corporation. All significant intercompany accounts and transactions are eliminated in consolidation.

Reclassifications

The Company has reclassified certain prior period amounts to conform to the current period presentation. The amounts reclassified impact Accounts Payable and Accounts Payable due to Intrexon Corporation ("Intrexon") for the year ended December 31, 2015.

Use of Estimates

The preparation of the Company's consolidated financial statements requires it to make estimates and assumptions that impact the reported amounts of assets, liabilities, revenues and expenses and the disclosure of contingent assets and liabilities in the Company's consolidated financial statements and accompanying notes. The most significant estimates in the Company's consolidated financial statements relate to the valuation of equity awards, warrant liability, recoverability of deferred tax assets, estimated useful lives of fixed assets and intangible assets. The Company bases estimates and assumptions on historical experience when available and on various factors that it believes to be reasonable under the circumstances. The Company evaluates its estimates and assumptions on an ongoing basis. The Company's actual results may differ from these estimates under different assumptions or conditions.

Histogenics Corporation

Notes to Consolidated Financial Statements

Foreign Currency Translation

The Company's consolidated financial statements are prepared in U.S. dollars. The Company's foreign subsidiary uses the U.S. dollar as its functional and reporting currency, as management determined that the U.S. dollar is the primary currency of the economic environment in which the subsidiary operates. When transactions are required to be paid in the local currency of the foreign subsidiary, any resulting foreign currency transaction gain or loss is recorded as a component of "Other income (expense), net" in the consolidated statements of operations.

Segment and Geographic Information

Operating segments are defined as components of an enterprise about which separate discrete financial information is available for evaluation by the chief operating decision-maker ("CODM") or decision-making group in making decisions regarding resource allocation and assessing performance. The Company operates in two geographic regions: the United States (Massachusetts) and Israel (Tel Aviv) and views its operations as two operating segments: Histogenics Corporation (United States) and ProChon (Israel) as the CODM reviews separate discrete financial information in making decisions regarding resource allocations and assessing performance. Operating segments that have similar economic characteristics can be aggregated. As the nature of the products, customers, and methods to distribute products are the same and the nature of the regulatory environment, the production processes and historical and estimated future margins are similar, the two operating segments have been aggregated into one reporting segment as they have similar economic characteristics.

Information about the Company's operations in different geographic regions is presented in the tables below:

	December 31, 2016	December 31, 2015
	(in thousands)	
Long-lived assets:		
United States	$ 3,860	$ 5,204
Israel	—	9
Total long-lived assets	$ 3,860	$ 5,213

Fair Value Measurements

The carrying amounts reported in the Company's consolidated financial statements for cash and cash equivalents, accounts payable, equipment loan, and accrued liabilities approximate their respective fair values because of the short-term nature of these accounts.

Fair value is defined as the price that would be received if selling an asset or paid to transfer a liability in the principal or most advantageous market for the asset or liability in an orderly transaction between market participants on the measurement date.

Fair value should be based on the assumptions that market participants would use when pricing an asset or liability and is based on a fair value hierarchy that prioritizes the information used to develop those assumptions. The fair value hierarchy gives the highest priority to quoted prices in active markets (observable inputs) and the lowest priority to the Company's assumptions (unobservable inputs). Fair value measurements should be disclosed separately by level within the fair value hierarchy. For assets and liabilities recorded at fair value, it is the Company's policy to maximize the use of observable inputs and minimize the use of unobservable inputs when developing fair value measurements, in accordance with established fair value hierarchy.

Histogenics Corporation

Notes to Consolidated Financial Statements

Fair value measurements for assets and liabilities where there exists limited or no observable market data are based primarily upon estimates, and often are calculated based on the economic and competitive environment, the characteristics of the asset or liability and other factors. Therefore, the results cannot be determined with precision and may not be realized in an actual sale or immediate settlement of the asset or liability. Additionally, there may be inherent weaknesses in any valuation technique, and changes in the underlying assumptions used, including discount rates and estimates of future cash flows, could significantly affect the results of current or future values.

Additionally, from time to time, the Company may be required to record at fair value other assets on a nonrecurring basis, such as assets held for sale and certain other assets. These nonrecurring fair value adjustments typically involve application of lower-of-cost-or-market accounting or write-downs of individual assets.

The fair value hierarchy gives the highest priority to unadjusted quoted prices in active markets for identical assets (Level 1), and the lowest priority to unobservable inputs (Level 3). The Company's financial assets are classified within the fair value hierarchy based on the lowest level of inputs that is significant to the fair value measurement. The three levels of the fair value hierarchy, and its applicability to the Company's financial assets, are described below.

Level 1: Unadjusted quoted prices in active markets that are accessible at the measurement date of identical, unrestricted assets.

Level 2: Quoted prices for similar assets, or inputs that are observable, either directly or indirectly, for substantially the full term through corroboration with observable market data. Level 2 includes investments valued at quoted prices adjusted for legal or contractual restrictions specific to the security.

Level 3: Pricing inputs are unobservable for the assets, that is, inputs that reflect the reporting entity's own assumptions about the assumptions market participants would use in pricing the assets. Level 3 includes private investments that are supported by little or no market activity.

Level 3 valuations are for instruments that are not traded in active markets or are subject to transfer restrictions and may be adjusted to reflect illiquidity and/or non-transferability, with such adjustment generally based on available market evidence. In the absence of such evidence, management's best estimate is used.

An adjustment to the pricing method used within either Level 1 or Level 2 inputs could generate a fair value measurement that effectively falls in a lower level in the hierarchy. The Company had no assets or liabilities classified as Level 1 or Level 2 as of December 31, 2016 and 2015 other than the money market fund described in the "Cash and Cash Equivalents" section below and there were no material re-measurements of fair value with respect to financial assets and liabilities, during the periods presented, other than those assets and liabilities that are measured at fair value on a recurring basis. Other than the warrants issued in connection with the private placement transaction which closed on September 29, 2016, the Company had no assets or liabilities classified as Level 3 as of December 31, 2016 and 2015. Transfers are calculated on values as of the transfer date. There were no transfers between Levels 1, 2 and 3 during the twelve months ended December 31, 2016 and 2015.

Histogenics Corporation

Notes to Consolidated Financial Statements

The fair value of the warrants was determined using a Monte Carlo simulation model. This model incorporated several assumptions at each valuation date including: the price of the Company's common stock on the date of valuation, the historical volatility of the price of the Company's common stock, the remaining contractual term of the warrant and estimates of the probability of a fundamental transaction occurring. See Note 8, Capital Stock, for further discussion of the private placement.

Description	Total	Quoted prices in active markets (Level 1)	Significant other observable inputs (Level 2)	Significant unobservable inputs (Level 3)
		(in thousands)		
December 31, 2016				
Assets:				
Money market funds	$30,318	$ 30,318	$ —	$ —
Liabilities:				
Warrant liability	13,197	—	—	13,197
December 31, 2015				
Money market funds	25,764	25,764	—	—

The following table provides a reconciliation of all liabilities measured at fair value using Level 3 significant unobservable inputs:

	As of December 31, 2016 (in thousands)
Beginning balance, January 1, 2016	$ —
Issuance of warrants,	30,704
Change in fair value of warrant liability	(17,507)
Ending balance	$ 13,197

Cash and Cash Equivalents

Cash and cash equivalents include cash in readily available checking and savings accounts and money market funds. The Company considers all highly liquid investments with an original maturity of three months or less from the date of purchase to be cash equivalents.

The Company's cash equivalents, which consist of money market funds, are measured at fair value on a recurring basis. As of December 31, 2016 and 2015, the carrying amount of cash and cash equivalents was $31.9 million and $30.9 million, respectively, which approximates fair value and was determined based upon Level 1 inputs. Money market funds are valued using quoted market prices with no valuation adjustments applied. Accordingly, these securities are categorized as Level 1 and had a balance of $30.3 million and $25.8 million as of December 31, 2016 and 2015, respectively, shown in the table above.

Concentration of Credit Risk

Financial instruments, which potentially subject the Company to significant concentration of credit risk, consist primarily of cash and cash equivalents. The Company maintains deposits in federally insured financial institutions in excess of federally insured limits. The Company has not experienced any losses in such accounts and management believes that the Company is not exposed to significant credit risk due to the financial position of the depository institutions in which those deposits are held. The Company has no financial instruments with off-balance sheet risk of loss.

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Property and Equipment

Property and equipment are recorded at historical cost. Costs for capital assets not yet placed into service are capitalized as construction in progress, and will be depreciated in accordance with the below guidelines once placed into service. Maintenance and repair costs are expensed as incurred. Costs which materially improve or extend the lives of existing assets are capitalized. The Company provides for depreciation and amortization using the straight-line method over the estimated useful lives of the assets, which are as follows:

Asset Category	Estimated Useful Lives
Office equipment	3 to 5 years
Laboratory equipment	3 to 5 years
Leasehold improvements	Shorter of the remaining lease term or useful life

Upon retirement or sale, the cost of assets disposed and the related accumulated depreciation are removed from the accounts and any resulting gain or loss is recorded in the consolidated statements of operations.

Impairment of Long-Lived Assets

Long-lived assets consist primarily of property and equipment and identifiable intangible assets. When impairment indicators exist, the Company's management evaluates long-lived assets for potential impairment. An impairment loss is recorded if and when events and circumstances indicate that assets might be impaired and the undiscounted cash flows estimated to be generated by those assets are less than the carrying amount of those assets. While the Company's current and historical operating losses and negative cash flows are indicators of impairment, management believes that future cash flows to be received support the carrying value of its long-lived assets.

Impairments, if any, are recognized in earnings. An impairment loss would be recognized in an amount equal to the excess of the carrying amount over the undiscounted expected future cash flows.

Intangible Asset

The Company's intangible asset consists of acquired in-process research and development ("IPR&D") obtained through the acquisition of ProChon. IPR&D represents the fair value assigned to research and development assets that have not been completed at the date of acquisition. The value assigned to acquired IPR&D is determined by estimating the costs to develop the acquired technology into commercially viable products, estimating the resulting revenue from the projects, and discounting the net cash flows to present value. The revenue and costs projections used to value acquired IPR&D were adjusted based on the probability of success of developing a new product. Additionally, the projections considered the relevant market sizes and growth factors, expected trends in technology and the nature and expected timing of new product introductions by the Company and its competitors. The rates utilized to discount the net cash flows to their present value were commensurate with the stage of development of the projects and uncertainties in the economic estimates used in the projections described above.

IPR&D is considered an indefinite-lived intangible asset and is assessed for impairment annually or more frequently if impairment indicators exist. When performing the impairment assessment, the Company first assesses qualitative factors to determine whether it is necessary to recalculate the fair value of its acquired IPR&D. If the Company believes, as a result of the qualitative assessment, that it is more likely than not that the fair value of acquired IPR&D is less than its carrying amount, it calculates the fair value using the same methodology as described above. If the carrying value of the Company's acquired IPR&D exceeds its fair value, then an impairment charge is taken and the intangible asset is written-down to its fair value. During the fourth

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quarter the Company deemed the value of the IPR&D to be zero for the year ended December 31, 2016 as it has no plans to advance the technology or use it in any future clinical development activities. The result was a write-off of $0.2 million. For the year ended December 31, 2015, the Company determined that there was impairment of its IPR&D of $0.3 million. The Company performed its annual impairment test of its IPR&D as of December 31, 2015 using an income approach, including a discount rate of 13%, applied to probability-adjusted after-tax cash flows. The Company believes that the assumptions are representative of those a market participant would use in estimating the fair value of the IPR&D.

Intangible asset, net of accumulated impairment charges, are summarized as follows:

	As of December 31, 2016			As of December 31, 2015		
	Cost	Accumulated Impairment	Net Book Value	Cost	Accumulated Impairment	Net Book Value
		(in thousands)			(in thousands)	
IPR&D	$630	$ (630)	$ —	$630	$ (430)	$ 200
	$630	$ (630)	$ —	$630	$ (430)	$ 200

Initial Public Offering Costs

The Company deferred direct incremental costs attributable with the IPO of its common stock prior to the closing of the IPO. These costs represent legal, accounting and other direct costs related to the Company's efforts to raise capital through a public sale of its common stock. Upon completion of the IPO, $3.9 million of IPO costs were reclassified to additional paid-in capital as a reduction of the IPO proceeds. As of December 31, 2014, the Company had paid $2.9 million with the remaining $1.0 million included in accounts payable in the consolidated balance sheet. This amount was subsequently paid in 2015.

Restricted Cash

Restricted cash represents cash held in a depository account at a financial institution to collateralize a conditional stand-by letter of credit related to the Company's Lexington, Massachusetts facility lease agreement. Restricted cash is reported as non-current unless the restrictions are expected to be released in the next twelve months.

Deferred Rent

Deferred rent consists of the difference between cash payments and the recognition of rent expense on a straight-line basis for the facilities the Company occupies. The Company's leases for its Waltham, Massachusetts facility and its Lexington, Massachusetts facility provide for fixed increases in minimum annual rental payments. The total amount of rental payments due over each lease term is being charged to rent expense ratably over the life of each lease, respectively.

Financial Instruments Indexed to and Potentially Settled in the Company's Common Stock

The Company evaluates all financial instruments issued in connection with its equity offerings when determining the proper accounting treatment for such instruments in the Company's financial statements. The Company considers a number of generally accepted accounting principles under U.S. GAAP to determine such treatment and evaluates the features of the instrument to determine the appropriate accounting treatment. The Company utilizes the Probability Weighted Expected Return Method ("PWERM"), Option Pricing Model ("OM") or other appropriate methods to determine the fair value of its derivative financial instruments. For financial instruments

indexed to and potentially settled in the Company's common stock that are determined to be classified as liabilities on the consolidated balance sheet, changes in fair value are recorded as a gain or loss in the Company's consolidated statement of operations with the corresponding amount recorded as an adjustment to the liability on its consolidated balance sheet.

Revenue Recognition

In the future, if we generate revenue, it may be through license agreements, collaborations and product sales. The Company recognizes revenue when all four of the following criteria are met: (1) persuasive evidence that an agreement exists; (2) delivery of the products and/or services has occurred; (3) the selling price is fixed or determinable; and (4) collectability is reasonably assured. The Company did not recognize any revenue for the years ended December 31, 2016 and 2015.

Research and Development Costs

Research and development costs are charged to expense as incurred. These costs include, but are not limited to: license fees related to the acquisition of in-licensed products; employee-related expenses, including salaries, benefits and travel; expenses incurred under agreements with contract research organizations and investigative sites that conduct clinical trials and preclinical studies; the cost of acquiring, developing and manufacturing clinical trial materials; facilities, depreciation and other expenses, which include direct and allocated expenses for rent and maintenance of facilities; insurance and other supplies; and costs associated with preclinical activities and regulatory operations.

Costs for certain development activities, such as clinical trials, are recognized based on an evaluation of the progress to completion of specific tasks using data such as patient enrollment, clinical site activations, or information provided to the Company by its vendors with respect to their actual costs incurred. Payments for these activities are based on the terms of the individual arrangements, which may differ from the pattern of costs incurred, and are reflected in the consolidated financial statements as prepaid or accrued research and development expense.

Collaboration Arrangements

Costs reimbursed to a collaborator for work that it performs are recorded as research and development expenses. These reimbursements can include payments for work performed, or a milestone for which a payment is due, the reimbursements or development milestone achievement are recorded as research and development expense.

In September 2014, the Company entered into a collaboration agreement with Intrexon Corporation ("Intrexon") for the development and commercialization of allogeneic cell therapeutics for the treatment or repair of damaged articular hyaline cartilage in humans, utilizing Intrexon's proprietary technology (the "Collaboration Agreement"). Under the terms of the Collaboration Agreement, the Company is responsible for the costs of development and commercialization, with some exceptions. Refer to Note 14, *Related Parties* for further details on all terms, conditions and exceptions of this collaboration.

License Agreements

Costs associated with licenses of technology are expensed as incurred and are included in research and development expenses.

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Patent Costs

Costs related to filing and pursuing patent applications are recorded as general and administrative expense as incurred since the recoverability of such expenditures is uncertain.

Stock-Based Compensation

The Company accounts for grants of stock options and restricted stock based on their grant date fair value and recognizes compensation expense over their vesting period. The Company estimates the fair value of stock options as of the date of grant using the Black-Scholes option pricing model and restricted stock based on the fair value of the underlying common stock as determined by management or the value of the services provided, whichever is more readily determinable.

Stock-based compensation expense represents the cost of the grant date fair value of employee stock option grants recognized over the requisite service period of the awards (usually the vesting period) on a straight-line basis, net of estimated forfeitures. The expense is adjusted for actual forfeitures at year end. Stock-based compensation expense recognized in the consolidated financial statements is based on awards that are ultimately expected to vest.

For stock option grants with performance-based milestones, the expense is recorded over the remaining service period after the point when the achievement of the milestone is probable or the performance condition has been achieved. For stock option grants with both performance-based milestones and market conditions, expense is recorded over the derived service period after the point when the achievement of the performance-based milestone is probable or the performance condition has been achieved. The Company issued performance-based awards in 2015, but not in 2016.

The Company accounts for stock options and restricted stock awards to non-employees using the fair value approach. Stock options and restricted stock awards to non-employees are subject to periodic revaluation over their vesting terms.

Income Taxes

The Company accounts for income taxes under the liability method, which requires the recognition of deferred tax assets and liabilities for the expected future tax consequences of events that have been included in the financial statements. Under this method, deferred tax assets and liabilities are determined on the basis of the differences between the financial statements and tax basis of assets and liabilities using enacted tax rates in effect for the year in which the differences are expected to reverse. The effect of a change in tax rates on deferred tax assets and liabilities is recognized in income in the period that includes the enactment date.

The Company recognizes net deferred tax assets to the extent that the Company believes these assets are more likely than not to be realized. In making such a determination, management considers all available positive and negative evidence, including future reversals of existing taxable temporary differences, projected future taxable income, tax-planning strategies, and results of recent operations. If management determines that the Company would be able to realize its deferred tax assets in the future, in excess of its net recorded amount, management would make an adjustment to the deferred tax asset valuation allowance, which would reduce the provision for income taxes.

The Company records uncertain tax positions on the basis of a two-step process whereby (1) management determines whether it is more likely than not that the tax positions will be sustained on the basis of the technical

merits of the position and (2) for those tax positions that meet the more likely than not recognition threshold, management recognizes the largest amount of tax benefit that is more than 50 percent likely to be realized upon ultimate settlement with the related tax authority. The Company recognizes interest and penalties related to unrecognized tax benefits within income tax expense. Any accrued interest and penalties are included within the related tax liability.

Earnings (Loss) per Common Share

Earnings (loss) per common share is calculated using the two-class method, which is an earnings allocation formula that determines earnings (loss) per share for the holders of the Company's common shares and participating securities. All series of preferred stock contain participation rights in any dividend paid by the Company and are deemed to be participating securities. Earnings available to common stockholders and participating convertible redeemable preferred shares are allocated to each share on an as-converted basis as if all of the earnings for the period had been distributed. The participating securities include a contractual obligation to share in losses of the Company and are included in the calculation of net loss per share in the periods that have a net loss.

Diluted earnings per share is computed using the more dilutive of (a) the two-class method, or (b) the if-converted method. The Company allocates earnings first to preferred stockholders based on dividend rights and then to common and preferred stockholders based on ownership interests. The weighted-average number of common shares included in the computation of diluted earnings (loss) gives effect to all potentially dilutive common equivalent shares, including outstanding stock options, warrants, convertible redeemable preferred stock and the potential issuance of stock upon the conversion of the Company's convertible notes. Common stock equivalent shares are excluded from the computation of diluted earnings (loss) per share if their effect is antidilutive.

Warrant Accounting

As noted in Note 9, the Company classifies warrants to purchase shares of its common stock as a liability on its consolidated balance sheet if the warrant is a free-standing financial instrument that may require the Company to transfer consideration upon exercise. Each warrant of this type is initially recorded at fair value on date of grant using the Monte Carlo simulation model and net of issuance costs, and is subsequently re-measured to fair value at each subsequent balance sheet date. Changes in fair value of the warrants are recognized as a component of other income (expense), net in the consolidated statement of operations. The Company will continue to adjust the liability for changes in fair value until the earlier of the exercise or expiration of the warrants.

Recently Adopted Accounting Pronouncements

In November 2015, Financial Accounting Standards Board ("the FASB") issued Accounting Standard Update ("ASU") No. 2015-17, Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes. The new standard requires that deferred tax assets and liabilities be classified as noncurrent in a classified statement of financial position. The Company prospectively adopted this guidance in the fourth quarter of 2015, which resulted in the removal of gross deferred tax assets and liabilities from the Company's consolidated balance sheet. The net impact was zero and the prior period was not retrospectively adjusted.

In November 2014, the FASB issued ASU No. 2014-16, Derivatives and Hedging (Topic 815): Determining Whether the Host Contract in a Hybrid Financial Instrument Issued in the Form of a Share Is More Akin to Debt or to Equity. This standard provides guidance to eliminate the existing diversity in practice in accounting for

hybrid financial instruments issued in the form of a share. A hybrid financial instrument consists of a “host contract” into which one or more derivative terms have been embedded. This guidance requires an entity to consider the terms and features of the entire financial instrument, including the embedded derivative features, in order to determine whether the nature of the host contract is more akin to debt or to equity. This guidance is effective for fiscal years and interim periods beginning after December 15, 2015, with early adoption permitted. A reporting entity should apply this guidance using a modified retrospective approach by recording a cumulative-effect adjustment to equity as of the beginning of the annual period of adoption. Retrospective application is permitted to all relevant prior periods. The Company has concluded that this guidance has no impact on the presentation of its results of operations, financial position and disclosures.

In August 2014, the FASB issued ASU No. 2014-15, Presentation of Financial Statements—Going Concern (Subtopic 2015-40): Disclosure of Uncertainties about an Entity’s Ability to Continue as a Going Concern. This guidance addresses management’s responsibility in evaluating whether there is substantial doubt about a company’s ability to continue as a going concern and to provide related footnote disclosures. The guidance is effective for fiscal years ending after December 15, 2016 and for interim periods within those fiscal years. The adoption of this standard did not have a material impact on our consolidated financial statements and related disclosures.

In June 2014, the FASB issued ASU No. 2014-12, Compensation-Stock Compensation (Topic 718): Accounting for Share-Based Payments When the Terms of an Award Provide That a Performance Target Could be Achieved after the Requisite Service Period. This standard provides guidance requiring when there is a performance target that affects vesting of equity awards granted and could be achieved after the requisite service period to be treated as a performance condition. A reporting entity should apply existing guidance on stock-based compensation, as it relates to such awards. This guidance is effective for annual periods and interim periods within those annual periods beginning after December 15, 2015 with early adoption permitted using either of two methods: (i) prospective to all awards granted or modified after the effective date; or (ii) retrospective to all awards with performance targets that are outstanding as of the beginning of the earliest annual period presented in the financial statements and to all new or modified awards thereafter, with the cumulative effect of applying this guidance as an adjustment to the opening retained earnings balance as of the beginning of the earliest annual period presented in the financial statements. The Company issued performance-based awards during the year ended December 31, 2015. The Company adopted this guidance on a prospective basis and there have not been any performance-based awards since the effective date of the guidance.

Recently Issued Accounting Pronouncements

In November 2016, the FASB issued guidance that requires restricted cash and restricted cash equivalents be included with cash and cash equivalents when reconciling the total beginning and ending amounts for the periods shown on the statement of cash flows. The new standard is effective for us on January 1, 2018 using a retrospective transition method to each period presented. Early adoption is permitted. We are currently evaluating the timing of our adoption and the expected impact that this standard could have on our consolidated financial statements and related disclosures.

In March 2016, the FASB issued ASU No. 2016-09, Compensation-Stock Compensation (Topic 718): Improvements to Employee Shared-Based Payment Accounting. This standard provides guidance on accounting for employee share-based payments. This guidance addresses several aspects of the accounting for share-based payment award transactions, including: (a) income tax consequences; (b) classification of awards as either equity or liabilities; and (c) classification on the statement of cash flows. This standard will be effective for fiscal years beginning after December 15, 2016, including interim periods within those fiscal years. The Company is

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evaluating the impact of this guidance on the presentation of its results of operations, financial position and disclosures.

In February 2016, the FASB, issued ASU No. 2016-02, Leases (Topic 842). The ASU requires companies to recognize on the balance sheet the assets and liabilities for the rights and obligations created by leased assets. ASU 2016-02 will be effective for the Company in the first quarter of 2019, with early adoption permitted. The Company is currently evaluating the impact that the adoption of ASU 2016-02 will have on the Company's consolidated financial statements or related disclosures.

In May 2014, the FASB issued ASU No. 2014-09, Revenue from Contracts with Customers (Topic 606), which requires an entity to recognize the amount of revenue to which it expects to be entitled for the transfer of promised goods or services to customers. ASU 2014-09 will replace most existing revenue recognition guidance in U.S. GAAP when it becomes effective. In July 2015, the FASB issued a one-year deferral of the effective date of the new revenue recognition standard. The new guidance will be effective for the Company's first quarter of fiscal year 2018 and early application for fiscal year 2017 would be permitted. The Company is evaluating the impact of this guidance on the presentation of its results of operations, financial position and disclosures.

3. LOSS PER COMMON SHARE

Basic and diluted loss per common share are calculated as follows:

	For the Year Ended	
	2016	2015
	(In thousands, except share and per share data	
Numerator:		
Net loss	$ (16,208)	$ (32,024)
Net Loss attributable to Series A Preferred Stock (a)	(2,345)	—
Numerator for basic EPS—Earnings (loss) attributable to common stockholders	(13,863)	(32,024)
Effect of dilutive securities:		
Deduct change in fair value of warrant liability	(17,507)	—
Numerator for diluted EPS—Earnings (loss) attributable to common stockholders after assumed conversions	$ (31,370)	$ (32,024)
Denominator:		
Weighted-average number of common shares used in earnings (loss) per share—basic	14,256,954	13,231,126
Effect of dilutive securities:		
Nonparticipating warrants	132,238	—
Denominator for diluted EPS—adjusted weighted average shares	14,389,192	13,231,126
Earnings (loss) per share—basic	$ (0.97)	$ (2.42)
Earnings (loss) per share—diluted	$ (2.18)	$ (2.42)

(a) The Series A Preferred Stock participates in income and losses

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The following potentially dilutive securities have been excluded from the computation of diluted weighted-average shares outstanding, as they would be anti-dilutive (in common stock equivalent shares):

	As of December 31,	
	2016	2015
Unvested restricted stock and options to purchase common stock	1,578,905	1,227,957
Series A preferred stock unconverted	5,962,817	—
Warrants exercisable into common stock	166,403	166,403

4. PREPAID EXPENSES AND OTHER CURRENT ASSETS

Prepaid expenses and other current assets consisted of the following:

	As of December 31,	
	2016	2015
	(in thousands)	
Deposits	$ 10	$ 67
Undelivered laboratory and office equipment	—	17
Insurance	95	42
Other current assets	68	195
Prepaid expenses and other current assets	$173	$321

5. PROPERTY AND EQUIPMENT

Property and equipment consisted of the following:

	December 31, 2016	December 31, 2015
	(in thousands)	
Office equipment	$ 266	$ 539
Laboratory equipment	4,443	4,337
Leasehold improvements	7,683	7,683
Construction in progress	759	547
Software	96	96
Total property and equipment	13,247	13,202
Less: accumulated depreciation	(9,387)	(7,989)
Property and equipment, net	$ 3,860	$ 5,213

Depreciation expense related to property and equipment amounted to $1.7 million and $1.6 million for the years ended December 31, 2016 and 2015, respectively.

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6. ACCRUED EXPENSES

Accrued expenses consisted of the following:

	As of December 31,	
	2016	2015
	(in thousands)	
Accrued compensation	$1,402	$ 758
Accrued clinical expenses	187	138
Accrued other	508	548
Total accrued expenses	$2,097	$1,444

7. COMMITMENTS AND CONTINGENCIES

Operating Leases

The Company leases office and research facilities in Waltham, Massachusetts under a non-cancellable operating lease, which expires in December 2017, with two additional five-year renewal options. Terms of the agreement provide for an initial rent-free period and future rent escalation, and provide that in addition to minimum lease rental payments, the Company is responsible for a pro-rata share of common area operating expenses. In June 2014, the Company entered into a lease agreement to rent a facility in Lexington, Massachusetts. The commencement date of the lease was July 9, 2014 with a term that extends through June 1, 2023, with one additional five-year renewal option. Terms of the lease agreement provide for an initial rent-free period and future rent escalation, and provide that in addition to minimum lease rental payments, the Company is responsible for a pro-rata share of operating expenses. The Company's wholly-owned subsidiary, ProChon, leased a facility in Woburn, Massachusetts which expired in 2016 and was not renewed.

Aggregate minimum annual lease commitments of the Company under its non-cancellable operating leases as of December 31, 2016, are as follows:

For the Year Ended December 31,	(in thousands)
2017	$ 2,266
2018	754
2019	586
2020	596
2021	605
Thereafter	926
Total minimum lease payments	$ 5,733

Rent expense under operating lease agreements amounted to $1.0 million and $1.1 million for the years ended December 31, 2016 and 2015, respectively.

As an inducement to enter into its Waltham facility lease, the lessor agreed to provide the Company with a construction allowance of up to $3.2 million towards the total cost of tenant improvements. As an inducement to enter into its Lexington facility lease, the lessor agreed to provide the Company with a construction allowance of up to $1.0 million towards the total cost of tenant improvements. The Company has recorded these costs in the consolidated balance sheet as leasehold improvements, with the corresponding liability as deferred lease incentive. These liabilities are amortized on a straight-line basis over the term of the lease as a reduction of rent expense.

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License Agreements

From time to time, the Company enters into various licensing agreements whereby the Company may use certain technologies in conjunction with its product research and development.

Licensing agreements and the Company's commitments under the agreements are as follows:

Hydrogel License

In May 2005, the Company entered into an exclusive license agreement with Angiotech Pharmaceuticals (US), Inc. for the use of certain patents, patent applications, and knowledge related to the manufacture and use of a hydrogel material in conjunction with NeoCart and certain other products ("Hydrogel License Agreement"). As of December 31, 2016, the Company has paid an aggregate $3.2 million in commercialization milestones under the terms of the Hydrogel License Agreement, which has been expensed to research and development.

Under the terms of the Hydrogel License Agreement, the Company's future commitments include:

- A one-time $3.0 million payment upon approval of an eligible product by the FDA; and
- Single digit royalties on the net sales of NeoCart and certain other future products.

Tissue Regeneration License

In April 2001, the Company entered into an exclusive license agreement with The Board of Trustees of the Leland Stanford Junior University ("Stanford University") for the use of certain technology to develop, manufacture and sell licensed products in the field of growth and regeneration of cartilage ("Tissue Regeneration License Agreement"). The term of the Tissue Regeneration License Agreement extends to the expiration date of Stanford University's last to expire domestic or foreign patents. As of December 31, 2016, the Company has paid an aggregate $0.7 million in patent reimbursement costs, royalty fees, and commercialization milestone payments under the terms of the Tissue Regeneration License Agreement, which have been recorded to research and development expense.

Under the terms of the Tissue Regeneration License Agreement, the Company's future commitments include:

- A one-time $0.3 million payment upon approval of an eligible product by the FDA;
- An annual minimum non-refundable royalty fee of $10 thousand for the life of the license that may be used to offset up to 50% of each earned royalty described below; and
- Low single digit royalties on net sales.

Honeycomb License

In March 2013, the Company entered into a license agreement with Koken Co., Ltd. ("Koken") and paid a fee for a non-exclusive, non-transferable and non-sublicensable right to use its know-how related to the process for manufacturing atelocollagen honeycomb sponge materials, which is used in scaffolds (the "Honeycomb License Agreement"). Under the terms of the Honeycomb License Agreement, future commitments will be based on the amount of materials supplied to the Company and may vary from period to period over the term of the agreement.

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Tissue Processor Sub-License

In December 2005, the Company entered into an exclusive agreement to sub-license certain technology from Purpose, Co. ("Purpose"), which is owned by a stockholder of the Company ("Sub-License Agreement"). Purpose entered into the original license agreement ("Original Agreement") with Brigham and Women's Hospital, Inc. ("Brigham and Women's") in August 2001. The Original Agreement shall remain in effect for the licensed patents owned by Brigham and Women's unless extended or terminated as provided for in the agreement. The technology is to be used to develop, manufacture, use and sell licensed products that cultivate cell or tissue development. The Sub-License Agreement extends to the expiration date of the last to expire domestic or foreign patents covered by the agreement. As of December 31, 2016, the Company has paid an aggregate $1.0 million in royalty and sub-license payments under the terms of the Sub-License Agreement.

The Sub-License Agreement was amended and restated in June 2012. Under the amended and restated agreement, the Company made Purpose the sole supplier of equipment the Company uses in its manufacturing processes, and granted Purpose distribution rights of the Company's products for certain territories. In exchange, Purpose allowed for the use of its technology (owned or licensed) and manufactured and serviced exogenous tissue processors used by the Company. Under the terms of the agreement, as amended, Purpose granted the Company: (a) exclusive rights to all of Purpose's technology (owned or licensed) related to the exogenous tissue processors, (b) continued supply of exogenous tissue processors during the Company's clinical trials, and (c) rights to manufacture the exogenous tissue processors at any location the Company chooses. In exchange for such consideration, the Company granted Purpose an exclusive license in Japan for the use of all of the Company's technology and made a payment of $0.3 million to reimburse Purpose for development costs on a next generation tissue processor.

In May 2016, the Original Agreement was amended whereby the Company acquired the development and commercialization rights to NeoCart for the Japanese market from Purpose. Under the terms of the amended agreement, the Company assumes sole responsibility for and rights to the development and commercialization of NeoCart in Japan. In exchange for the transfer of development and commercialization rights, the Company will pay a success-based milestone to Purpose upon conditional approval of NeoCart in Japan, as well as commercial milestones and a low single digit royalty on Japanese sales of NeoCart, upon full approval, if any, in Japan

In addition to the above, the Company's future commitments under the terms of the Original Agreement and Sub-License Agreement include:

- A minimum non-refundable annual royalty fee of $20 thousand, for the life of the license;
- An additional, non-refundable annual royalty fee of $30 thousand from 2016 through 2019;
- $10.2 million in potential milestone payments; and
- Low single digit royalties on net sales of a licensed product.

The OCS Agreement

In connection with its research and development, the Company received grants from the Office of Chief Scientist of the Ministry of Industry and Trade in Israel ("OCS") in the aggregate of $1.1 million for funding the fibroblast growth factor ("FGF") program. In consideration for this grant, the Company is committed to pay royalties at a rate of 3% to 5% of the sales of sponsored products developed using the grant money, up to the amount of the participation payments received. The Company committed to pay up to 100% of grants received plus interest according to the LIBOR interest rate if the sponsored product is produced in Israel. If the manufacturing of the sponsored product takes place outside of Israel, the royalties can increase up to, but no more than, 300% of grants

received plus interest based on the LIBOR interest rate, depending on the percentage of the manufacturing of sponsored product that takes place outside of Israel.

Engineering Agreement

The Company entered into an agreement with a development corporation to purchase a multi-unit bioreactor system. Pursuant to the agreement, as of December 31, 2016, the Company made total payments in an aggregate amount of $0.6 million of which $0.2 million was made in 2016 after acceptance of the final product. There are no additional payments due under this agreement.

Collagen Supply Agreement

In September 2015, the Company entered into an agreement with Collagen Solutions (UK) Limited (the "Supplier") to purchase soluble collagen that meets specifications provided by the Company. The initial term of the agreement is three years and will automatically renew from year to year thereafter unless otherwise terminated with at least 180 days' notice by either party. Pursuant to the agreement, starting 12 months after entering into the agreement, the Company will be required to order a minimum amount of material and/or services totaling $0.2 million from the Supplier in each calendar year until the expiration of the initial term of the agreement. The Company also committed to pay a non-refundable payment totaling $0.1 million by the end of 2015. This expense was recorded to research and development expense as of December 31, 2015.

8. CAPITAL STOCK

On September 29, 2016, the Company closed the private placement contemplated by the securities purchase agreement (the "Purchase Agreement"), dated September 15, 2016, between the Company and certain institutional and accredited investors in which the Company received gross proceeds of $30.0 million (the "Private Placement"). The net proceeds after deducting placement agent fees and other transaction-related expenses was $27.6 million. At the closing, the Company issued 2,596,059 shares of the Company's common stock at a per share price of $2.25 and 24,158.8693 shares of the Company's newly-created Series A Convertible Preferred Stock ("Series A Preferred Stock"), which are convertible into approximately 10,737,275 shares of common stock. As part of the Private Placement, the investors received warrants to purchase up to 13,333,334 shares of the Company's common stock at an exercise price of $2.25 per share. The placement agent for the Private Placement, H.C. Wainwright & Co. LLC ("HCW"), and certain of its affiliates were also granted warrants to purchase 133,333 shares of the Company's common stock at an exercise price of $2.25 per share in exchange for the services provided by HCW. The placement agent warrants were considered a financing cost of the Company and included in warrant expense within the consolidated statements of operations.

The warrants include a cashless-exercise feature that may be exercised solely in the event there is no effective registration statement, or no current prospectus available for, the resale of the shares of common stock underlying the warrants as of the six-month anniversary of the closing of the Private Placement. Upon a fundamental transaction, the holders of the warrant may require the Company to purchase any unexercised warrants in an amount equal to the Black-Scholes value of the option. A fundamental transaction is defined as a merger, sale of assets, sale of the Company, recapitalization of stock and a sale of stock whereby any owner after the transaction would own greater than 50% of the outstanding common stock in the Company. The warrants became exercisable following approval of the Private Placement by our stockholders in the fourth quarter of 2016 and expire five years after the date of such stockholder approval. The Company determined the warrants are classified as a liability on the consolidated balance sheet because they contain a provision whereby in a fundamental transaction (as described above), the holder can elect to receive either the amount they are entitled

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to on an as-if-exercised basis or an amount based on the Black-Scholes value of the warrants at the time of the fundamental transaction. At the issuance date, the warrants were recorded at the fair value of $30.7 million and approximately $0.4 million excess of the fair value of the liability recorded for these warrants over the proceeds received was recorded as a charge to earnings in the third quarter of 2016 and is included in warrant expense within the consolidated statement of operations. In connection with the Private Placement, the Company incurred expenses of $3.1 million in warrant expense within the consolidated statements of operations.

Concurrent with the closing of the Private Placement, the Company's Certificate of Incorporation was amended by the filing of a Certificate of Designation to create the Series A Preferred Stock. The Series A Preferred Stock has a par value of $0.01 and each share is convertible into 444.44 shares of common stock, at a conversion price of $2.25 per share, at the option of the holder. The Series A Preferred Stock has no voting rights and is only entitled to dividends as declared on an as-converted basis. The Series A Preferred Stock contains no liquidation preferences or redemption rights and shares in distributions of the Company on an as-converted basis with the common stock.

As part of the Private Placement, affiliates of certain members of the Company's Board of Directors purchased an aggregate of 283,046 shares of common stock, an aggregate of 2,563.1439 shares of Series A Preferred Stock and received warrants to purchase up to 1,422,221 shares of common stock at an exercise price of $2.25 per share in the Private Placement. These amounts are included in the amounts noted above.

Common Stock-100,000,000 shares authorized

The holders of shares of common stock are entitled to one vote per share. The holders of shares of common stock are not entitled to receive dividends, unless declared by the Company's board of directors out of legally available funds, if ever.

Reserved for future issuance

The Company has reserved for future issuance the following number of shares of common stock:

	As of December 31,	
	2016	2015
Vesting of restricted stock	1,889	5,190
Options to purchase common stock	1,577,016	1,222,767
Common stock warrants	13,633,070	166,403
Total	15,211,975	1,394,360

Preferred Stock-30,000,000 shares authorized

Series A Convertible Preferred Stock

On September 29, 2016, the Company issued 24,158.8693 shares of newly-created Series A Convertible Preferred Stock, which were convertible into approximately 10,737,275 shares of common stock at an initial conversion price of $2.25. The Series A Preferred Stock has a par value of $0.01 and each share is convertible into 444.44 shares of common stock at the option of the holder. The holders of Series A Preferred Stock have no voting rights, share in both income and losses and are only entitled to dividends as declared on an as-converted basis. The Series A Preferred Stock contains no liquidation preferences or redemption rights and shares in the

distribution of the Company on an as-converted basis with the common stock. The Series A Preferred Stock shall not be converted if, after giving effect to the conversion, the holder and its affiliated persons would own beneficially more than 4.99% of our common stock (subject to adjustment up to 9.99% solely at the holder's discretion upon 61 days' prior notice to us or, solely as to a holder, if such limitation is waived by such holder upon execution of the private placement agreement).

9. WARRANTS

Investor Warrants

In September 2016, in connection with the Private Placement, the Company issued common stock warrants to the investors to purchase up to 13,333,334 shares of our common stock at an exercise price of $2.25 per share. The warrants include a cashless-exercise feature that may be exercised solely in the event there is no effective registration statement registering, or no current prospectus available for, the resale of the shares of common stock underlying the warrants as of the six-month anniversary of the closing of the Private Placement. The warrants became exercisable following approval of the Private Placement by our stockholders in the fourth quarter of 2016 and expire five years after the date of such stockholder approval. The warrants were valued at $2.28 per share using a Monte Carlo simulation and are marked-to-market on a quarterly basis with the change in value recorded as warrant expense or income on the consolidated statements of operations.

Placement Agent Warrants

In September 2016, in connection with the Private Placement, the Company issued HCW and certain of its affiliates warrants for the purchase of 133,333 shares of common stock at an exercise price of $2.25 per share. The HCW warrants became exercisable following approval of the Private Placement by our stockholders in the fourth quarter of 2016 and expire five years after the date of such stockholder approval. The warrants were valued at $2.28 per share using a Monte Carlo simulation and are marked-to-market on a quarterly basis with the change in value recorded as warrant expense or income on the consolidated statements of operations.

Affiliates of an Advisor Warrant

On July 20, 2012, the Company issued a warrant to purchase its common stock to affiliates of an advisor. The warrant provides the holders with the right to purchase an aggregate of 161,977 shares of the Company's common stock at a per share exercise price of $0.01. The warrants are exercisable, in whole or in part, immediately upon issuance and may be exercised on a cashless basis. The warrants expire on the tenth anniversary of issuance. The fair value of the warrants as of July 20, 2012 was estimated using the OM with the following inputs: (a) risk-free interest rate of 0.22%; (b) implied volatility of the Company's common stock of 99%; and (c) the expected term to a liquidity event of 1.7 years. On December 3, 2014, the Company completed its IPO and warrants for 5,839 shares of common stock were surrendered and common stock was issued by the Company to Purpose, Co. for the warrant shares surrendered. As of December 31, 2016 and 2015, warrants to purchase an aggregate of 156,138 shares of the Company's common stock at an exercise price of $0.01 are outstanding.

Consulting Agreement Warrant

In March 2015, in connection with a consulting agreement entered into for an interim chief financial officer, the Company issued a common stock warrant as compensation to the consulting firm. The warrant provides the holder with the right to purchase an aggregate of 7,398 shares of the Company's common stock at a per share exercise price of $9.75, the closing price of the Company's common stock on the date of issuance. The warrant

vested and became exercisable in monthly installments over 24 months beginning September 30, 2015 and expires on the tenth anniversary of issuance. The warrant is equity classified and accounted for using the fair value approach. The fair value of the warrant is estimated using the Black-Scholes option pricing model and is subject to re-measurement at each reporting period until the measurement date is reached. On December 21, 2015, the Company terminated the consulting agreement resulting in the forfeiture of 50% (3,699) of the shares eligible for exercise under the warrant. The remaining 3,699 shares were vested and exercisable on December 31, 2016 and December 31, 2015.

10. EQUIPMENT LOAN PAYABLE

As of December 31, 2016 and 2015, the Company had the following outstanding borrowing obligations:

	December 31, 2016	December 31, 2015
	(in thousands)	
Silicon Valley Bank Equipment Loan Payable	$ 761	$ 1,344
Less: current portion	(583)	(583)
Long-term debt, net	$ 178	$ 761

In July 2014, the Company entered into a loan and security agreement with Silicon Valley Bank, which provides for a line of credit to finance certain equipment purchases up to an aggregate of $1.8 million through March 31, 2015. The line has been fully drawn and is payable in 36 monthly installments of principal and interest, with an annual interest rate of 2.75% plus the greater of 3.25% and the prime rate in effect at the time of each draw, as published in the Wall Street Journal. The outstanding balance on the line of credit is secured by a first priority lien over all equipment purchased using the line of credit.

In accordance with the terms of the equipment line of credit, the Company issued a warrant to Silicon Valley Bank in July 2014 to purchase 6,566 shares of our common stock at an exercise price per share of $7.99.

The equipment line of credit includes customary operating but non-financial covenants, including limitations on the Company’s ability to incur additional indebtedness, issue dividends, sell assets, engage in any business other than its current business, merge or consolidate with other entities, create liens on our assets, make investments, repurchase stock in certain instances, enter into transactions with affiliates, make payments on subordinated indebtedness and transfer or encumber any collateral securing the debt.

As of December 31, 2016 and 2015, $0.8 and $1.3 million respectively, of borrowings were outstanding under the line of credit and the Company was in compliance with all required covenants.

11. STOCK-BASED COMPENSATION

Restricted Stock Awards and Stock Options

The Company adopted the 2012 Equity Incentive Plan, as amended (“2012 Plan”) in July 2012 pursuant to which 609,389 shares of common stock were authorized for issuance to employees, officers, directors, consultants and advisors of the Company as of December 31, 2014. Upon the closing of the IPO on December 3, 2014, no further grants will be made under the 2012 Plan as the 2013 Equity Incentive Plan (“2013 Plan”) replaced the 2012 Plan on this date. The 2012 Plan provided for the grant of incentive stock options, non-statutory stock options, rights to purchase restricted stock, stock appreciation rights, phantom stock awards and stock units. In connection with

the issuance of restricted common stock, the Company maintains a repurchase right and shares of restricted common stock are released from such repurchase right over a period of time of continued service by the recipient. Recipients of incentive stock options shall be eligible to purchase shares of the Company's common stock at an exercise price equal to no less than the estimated fair value of such stock on the date of grant. Stock options generally vest 25% on the first anniversary of the original vesting date, with the balance vesting monthly over the remaining three years, unless they contain specific performance and/or market-based vesting provisions. The maximum term of stock options granted under the 2012 Plan is ten years.

In determining the exercise prices for options granted, the board of directors considered the fair value of the common stock as of the measurement date. The fair value of the common stock was determined by the board of directors based on a variety of different factors, including valuations prepared by third party valuation specialists, Company's financial position, the status of development efforts within the Company, the composition and ability of the current scientific and management teams, the current climate in the marketplace, the illiquid nature of the Company's common stock, arm's length sale of the Company's preferred stock, the effect of the rights and preferences of the preferred stockholders, and the prospects of a liquidity event, among others.

2013 Equity Incentive Plan

The Company's board of directors adopted the 2013 Plan in November 2013 which the stockholders approved in October 2014. The 2013 Plan provides for the grant of incentive stock options, non-statutory stock options, rights to purchase restricted stock, stock appreciation rights and stock units. In connection with the issuance of restricted common stock, the Company maintains a repurchase right and shares of restricted common stock are released from such repurchase right over a period of time of continued service by the recipient. Recipients of stock options shall be eligible to purchase shares of the Company's common stock at an exercise price equal to no less than the estimated fair value of such stock on the date of grant. Stock options generally vest 25% on the first anniversary of the original vesting date, with the balance vesting monthly over the remaining three years, unless they contain specific performance and/or market-based vesting provisions. The maximum term of stock options granted under the 2013 Plan is ten years. In June 2016, the Company's stockholders approved an amendment to the EIP to increase the number of shares of common stock available for issuance under the 2013 Plan by 300,000 shares and increase the number of shares of common stock automatically added to the 2013 Plan on January 1 of each year during the term of the 2013 Plan, starting with January 1, 2017 (the "EIP Amendment"). Following adoption of the EIP Amendment, the number of shares of common stock available for issuance under the 2013 Plan is subject to an automatic annual increase on the first day of the Company's calendar year beginning in 2017 equal to the lesser of (a) 4.0% of the total number of shares of common stock outstanding on December 31 of the prior year or, (b) the number determined by the Company's Board of Directors Accordingly, the number of shares of common stock available for issuance under the EIP was increased by 825,904 shares effective January 1, 2017. To the extent any awards under the 2013 Plan are forfeited, terminate, expire, lapse without the issuance of shares, or if the Company repurchases shares subject to awards under the 2013 Plan, those shares will again become available for issuance under the 2013 Plan.

2013 Employee Stock Purchase Plan

The Company's board of directors adopted the 2013 Employee Stock Purchase Plan ("2013 ESPP") in November 2013 which the stockholders approved in October 2014. The 2013 ESPP became effective upon the closing of the IPO on December 3, 2014. The Company's 2013 ESPP qualifies under Section 423 of the Internal Revenue Code of 1986, as amended (the "Code"). Under the 2013 ESPP, 103,665 shares of the Company's common stock are authorized for issuance to eligible employees. The number of shares reserved for issuance under the 2013 ESPP is automatically increased on the first business day of each of the Company's fiscal years, commencing in 2015,

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by a number equal to the lowest of (a) 51,832 shares of common stock,(b) 1% of the shares of common stock outstanding on the last business day of the prior fiscal year; or (c) the number of shares determined by the Company's Board of Directors. Accordingly, the number of authorized shares of the Company's common stock authorized for issuance to eligible employees under the 2013 ESPP was increased by 206,476 shares effective January 1, 2017. The number of shares reserved under the 2013 ESPP will automatically be adjusted in the event of a stock split, stock dividend or a reverse stock split (including an adjustment to the per-purchase period share limit). The Company's 2013 ESPP permits each eligible employee to purchase common stock through payroll deductions. There was no activity under the Plan in 2016 and 2015.

Stock option activity under the 2012 and 2013 plans is summarized as follows:

	Number of Options	Weighted-Average Exercise Price	Weighted-Average Remaining Contractual Term (in years)	Aggregate Intrinsic Value (in thousands)
Outstanding at December 31, 2015	1,229,339	$ 7.32	9.0	$ (4,679)
Granted	464,240	2.02		
Exercised	(3,685)	0.76		
Cancelled	(112,878)	4.97		
Outstanding at December 31, 2016	1,577,016	$ 5.95	8.4	$ 71
Vested and expected to vest at December 31, 2016	1,492,341	$ 5.97	8.4	$ 69
Exercisable at December 31, 2016	561,693	$ 6.79	7.8	$ 52

As of December 31, 2016 and 2015, the unrecognized compensation cost related to outstanding options was $2.6 million and $3.9 million, respectively, and is expected to be recognized as expense over approximately 2.01 years and 2.68 years, respectively. The intrinsic value of options exercised during the years ended December 31, 2016 and 2015 was $10 thousand and $0.3 million, respectively.

As of December 31, 2016, the weighted average grant date fair value of vested options was $4.71 and the weighted average grant date fair value of options outstanding was $3.67.

Additional information about the Company's stock option activity is as follows:

	Year Ended December 31,	
	2016	2015
Weighted-average grant date fair value per share of employee option grants within the year	$ 1.26	$ 4.08
Cash received upon exercise of options	3	39

Restricted stock awards under the 2012 and 2013 plans are summarized as follows:

	Number of Shares	Weighted Average Grant Date Fair Value
Unvested at December 31, 2015	5,190	$ 1.07
Vesting of restricted stock	(3,301)	
Unvested at December 31, 2016	1,889	$ 0.83

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As of December 31, 2016 and 2015, the unrecognized compensation cost related to restricted stock awards was $1 thousand and $4 thousand respectively, and is expected to be recognized as expense over approximately 0.3 years and 1.2 years, respectively.

Stock-Based Compensation Expense

The Company granted stock options to employees for the years ended December 31, 2016 and 2015. The Company estimates the fair value of stock options as of the date of grant using the Black-Scholes option pricing model and restricted stock based on the fair value of the award. Stock options and restricted stock issued to non-board member, non-employees are accounted for using the fair value approach and are subject to periodic revaluation over their vesting terms.

For all periods from inception to date, stock-based compensation for all options granted and restricted stock awards are classified as research and development expense and general and administrative expense. Stock compensation expense amounted to approximately $1.5 million and $1.2 million for the years ended December 31, 2016 and 2015, respectively. Included in the table below is restricted stock-based compensation expense of $2 thousand and $4 thousand, respectively, recorded in general and administrative expense during the years ended December 31, 2016 and 2015.

Stock-based compensation is as follows:

	Year Ended	
	2016	2015
	(in thousands)	
Research and development	$ 491	$ 451
General and administrative	1,057	777
Total stock-based compensation expense	$1,548	$1,228

The weighted-average assumptions used in the Black-Scholes option pricing model to determine the fair value of the employee stock option grants were as follows:

	Year Ended	
	2016	2015
Risk-free interest rate	1.73%	1.68%
Expected volatility	72.5%	62.6%
Expected term (in years)	6.08	6.04
Expected dividend yield	0.0%	0.0%

The weighted-average assumptions used in the Black-Scholes option pricing model to determine the fair value of the non-employee stock option grants were as follows:

	Year Ended	
	2016	2015
Risk-free interest rate	1.57%	1.79%
Expected volatility	63.5%	63.2%
Expected term (in years)	7.00	6.16
Expected dividend yield	0.0%	0.0%

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Risk-free Interest Rate. The risk-free interest rate assumption is based on observed interest rates appropriate for the expected term of the stock option grants.

Expected Volatility. Due to the Company's limited operating history and lack of company-specific historical or implied volatility, the expected volatility assumption is based on historical volatilities of a peer group of similar companies whose share prices are publicly available. The peer group was developed based on companies in the biotechnology and medical device industries.

Expected Term. The expected term represents the period of time that options are expected to be outstanding. Because the Company does not have historical exercise behavior, through December 31, 2016 it determined the expected life assumption using the simplified method, which is an average of the contractual term of the option and its vesting period.

Expected Dividend Yield. The expected dividend yield assumption is based on the fact that the Company has never paid cash dividends and has no present intention to pay cash dividends.

12. INCOME TAXES

For the years ended December 31, 2016 and 2015, the Company did not record a current or deferred income tax expense or benefit due to current and historical losses incurred by the Company.

The components of loss before income taxes were as follows:

	As of December 31,	
	2016	2015
	(in thousands)	
U.S.	$(15,838)	$(31,382)
Foreign	(369)	(691)
Total	$(16,208)	$(32,073)

A reconciliation of income tax expense (benefit) computed at the statutory federal income tax rate to income taxes as reflected in the financial statements is as follows:

	As of December 31,	
	2016	2015
Federal income tax (benefit) at statutory rate	34.0%	34.0%
(Increase) decrease income tax benefit resulting from:		
Permanent differences	29.0	(1.2)
Net Operating Loss Limitation	(111.1)	—
R&D Credit Limitation	(1.5)	—
Change in valuation allowance	48.7	(31.7)
Other	0.9	(1.2)
Income tax expense (benefit)	0.0%	0.0%

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Deferred taxes are recognized for temporary differences between the basis of assets and liabilities for financial statement and income tax purposes. The significant components of the Company's deferred tax assets and liabilities are comprised of the following:

	As of December 31,	
	2016	2015
Deferred tax assets:		
Net operating loss carryforwards	$ 16,146	$ 28,200
Depreciation and amortization	6,229	6,688
Accrued expenses	2,082	1,183
Capitalized start-up costs	10,037	8,531
Other	75	259
Deferred tax assets before valuation allowance	34,569	44,861
Valuation allowance	(34,569)	(43,751)
	—	1,110
Deferred tax liabilities		
IPR&D	—	(36)
Change in accounting method	—	(1,074)
	—	(1,110)
Net deferred tax assets	$ —	$ —

The Company has evaluated the positive and negative evidence bearing upon the realizability of its deferred tax assets. As of December 31, 2016 and 2015, based on the Company's history of operating losses, the Company has concluded that it is not more likely than not that the benefit of its deferred tax assets will be realized. Accordingly, the Company has provided a full valuation allowance for deferred tax assets as of December 31, 2016 and 2015. The valuation allowance decreased $9.2 million during the year ended December 31, 2016, due primarily to a reduction of net operating losses generated. The valuation allowance increased by $11.8 million during the year ended December 31, 2015, due primarily to net operating losses generated and capitalized expenses. In addition, the reduction in net operating losses were related to Section 382 limits as a result in a change in ownership.

During November 2015, the FASB issued ASU 2015-17, "Balance Sheet Classification of Deferred Taxes", which simplifies the presentation of deferred income taxes. This ASU requires that deferred tax assets and liabilities be classified as non-current in a statement of financial position. We early adopted ASU 2015-17 effective December 31, 2015 on a prospective basis. Adoption of this ASU resulted in the removal of gross deferred tax assets and liabilities from the Company's Consolidated Balance Sheet at December 31, 2015. The impact was zero. No prior periods were retrospectively adjusted. As of December 31, 2016 and 2015, the Company had U.S. federal NOL carryforwards of $24.5 million, and $55.5 million, respectively, which may be available to offset future income tax liabilities and expire at various dates through 2036. As of December 31, 2016 and 2015, the Company also had U.S. state NOL carryforwards of $24.3 million and $55.4 million, respectively, which may be available to offset future income tax liabilities and expire at various dates through 2036. At December 31, 2016 and 2015, the Company also had $26.1 million and $25.6 million, respectively, of foreign NOL carryforwards which may be available to offset future income tax liabilities, which carryforwards do not expire.

Utilization of the NOL and research and development credit carryforwards may be subject to a substantial annual limitation due to ownership change limitations that have occurred or that could occur in the future, as required by Section 382 and Section 383 of the Code, as well as similar state and foreign provisions. These ownership

changes may limit the amount of NOL and research and development credit carryforwards that can be utilized annually to offset future taxable income and tax, respectively. In general, an "ownership change" as defined by Section 382 of the Code results from a transaction or series of transactions over a three-year period resulting in an ownership change of more than 50 percentage points of the outstanding stock of a company by certain stockholders. The Company has completed a study to assess whether an ownership change has occurred or whether there have been multiple ownership changes since its formation. The results of this study indicated we experienced ownership changes, as defined by Section 382 of the Code, in each of 2006, 2011, 2012, 2013, and 2016. The Company has not recorded NOLs that, as a result of these restrictions, will expire unused. The limitations were approximately $47.1 million in 2015 and $100.1 million in 2016.

The changes in the Company's unrecognized tax benefits are summarized as follows:

	As of December 31,	
	2016	2015
	(in thousands)	
Unrecognized tax benefit, beginning of year	$ 687	$ 811
Increase (decrease) related to current year positions	(125)	(124)
Settlements	—	—
Unrecognized tax benefit, end of year	$ 562	$ 687

As of December 31, 2016 and 2015, the total amount of unrecognized tax benefits was $0.6 million and $0.7 million, respectively which, if recognized, would favorably affect the effective income tax rate in future periods. Note that liabilities for unrecognized tax benefits have been recorded to the extent that they do not exceed the Company's available losses that are not limited as a result of ownership changes that have occurred under Section 382 of the Code. Reductions to unrecognized tax benefits for limitations on the utilization of net operating losses due to ownership changes occurring during the year has been reflected in the table as reductions based on tax positions related to the current year. Histogenics accrues interest and penalties related to unrecognized tax benefits as a component of its provision for income taxes. No accrued interest and penalties related to the Company's unrecognized tax benefits has been accrued as of December 31, 2016 and 2015. The Company believes that it is reasonably possible that none of its unrecognized tax benefits, may be recognized at the end of 2016. The Company or one of its subsidiaries files income tax returns in the United States and various states and Israel. The Company is subject to U.S. federal, state and local income tax examinations by tax authorities for years 2001 through present. Carryforward attributes that were generated in earlier periods remain subject to examination to the extent the year in which they were used or will be used remains open for examination. The tax years which remain subject to examination by tax authorities in Israel, as of December 31, 2016, include years 2013 through the present.

13. EMPLOYEE BENEFITS

The Company has a defined contribution 401(k) plan for employees who are at least 21 years of age. Employees are eligible to participate in the plan beginning on the first day of the calendar quarter following their date of hire. Under the terms of the plan, employees may make voluntary contributions as a percent of compensation. No matching contributions have been made by the Company since the adoption of the 401(k) plan.

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14. RELATED PARTIES

Intrexon Corporation

In September 2014, the Company entered into an Exclusive Channel Collaboration agreement with Intrexon (the "Collaboration Agreement") to use Intrexon's proprietary technology for the development and commercialization of allogeneic cell therapeutics (the "Collaboration Products") to treat or repair damaged articular hyaline cartilage in humans. The term of the Collaboration Agreement commenced upon the effective date, September 30, 2014, and continues until either written notice of termination is given by the Company within ninety days, or if either party creates a material breach that cannot be remedied within sixty days.

Under the terms of the Collaboration Agreement, the Company is solely responsible for the costs to develop and commercialize any Collaboration Products with the following exceptions: (i) the establishment of certain manufacturing capabilities and facilities; (ii) the cost of basic research related to Intrexon's proprietary technology outside of costs related to the Collaboration Products; (iii) payments related to certain in-licensed third party IP; (iv) the costs of filing, prosecution and maintenance of Intrexon patents; and (v) any other costs mutually agreed upon as being the responsibility of Intrexon. As partial consideration, the Company will pay commercialization milestones totaling $12 million, if and when achieved, and sales milestones totaling $22.5 million, if and when achieved. The milestone payments are payable in cash or shares of the Company's common stock at the option of the Company. In the event the Company is sold prior to making any of these milestone payments and the Collaboration Agreement is transferred in the sale, the milestone payments would be payable in cash. The Company is also required to make low double digit royalty payments to Intrexon on any gross profit arising from the sale of Collaboration Products and to pay an intermediate double digit percentage of any sublicensing revenue it receives.

Under the terms of the Collaboration Agreement, the Company reimburses Intrexon for 50% of the product research and development costs with the remaining 50% due after acceptance by the FDA or equivalent regulatory authority of an Investigational New Drug Application or equivalent regulatory filing of a collaboration product or upon 90 day written notice of cancellation by the Company. Total incurred expenses were $3.0 million and $3.1 million for the year ended December 31, 2016 and 2015, respectively. The total accrued expenses due Intrexon at December 31, 2016 and December 31, 2015 was $3.0 million and $1.5 million, respectively. Amounts are reflected as current liabilities in the consolidated balance sheet as of December 31, 2015. Amounts have been reclassified to long term liabilities in the consolidated balance sheet as of December 31, 2016, as a result of a change in circumstances, including the plans for products that we are developing as a part of the Exclusive Channel Collaboration with Intrexon. These expenses were included in research and development in the consolidated statement of operations.

Purpose, Co.

In June 2012, the Company entered into an agreement with Purpose, Co. to amend its previous agreements. In the previous agreements, Purpose, Co. granted the Company a perpetual license to its patents related to its exogenous tissue processor which is used in the development of the Company's products. In exchange, the Company granted Purpose, Co. a perpetual license to all of the Company's biotechnology and biomaterial for use in Japan. The agreement provides for Purpose, Co. to manufacture and sell machinery to the Company for cost until the Company's products become commercially viable. The Company has also agreed to pay royalties on any third-party revenue generated using Purpose, Co.'s licensed technology.

Under the June 2012 amendment, the Company received exclusive rights to all of Purpose, Co.'s technology related to the exogenous tissue processor, continued supply of exogenous tissue processors during the Company's clinical trials, and rights to manufacture the exogenous tissue processors at any location the Company chooses. In

exchange for such consideration, the Company named Purpose, Co. the sole manufacturer of equipment and also clarified the geographic territories of the exclusive license that Purpose Co. was granted for use of the Company's technology. Also, the Company agreed to reimburse Purpose, Co. for $0.3 million of development costs on a next generation tissue processer. Refer to the discussion under Note 7, *Tissue Processor Sub-License*.

In May 2016, the Company acquired the development and commercialization rights to NeoCart for the Japanese market from Purpose, Co. Under the terms of the amended agreement, the Company assumes sole responsibility for and rights to the development and commercialization of NeoCart in Japan. In exchange for the transfer of development and commercialization rights, the Company will pay a success-based milestone to Purpose upon conditional approval of NeoCart in Japan, as well as commercial milestones and a low single digit royalty on Japanese sales of NeoCart, upon full approval, if any, in Japan.

The amounts that have been paid to Purpose, Co. under this agreement were $0.1 and $0.2 million for the years ended December 31, 2016 and 2015, respectively.

Board of Director Affiliates

Affiliates of certain members of the Company's Board of Directors participated in the Private Placement as described in Note 8.

15. SUBSEQUENT EVENTS

On February 22, 2017, the Company entered into an amendment with Collagen Solutions (UK) LTD (the "Supplier"). The original agreement was entered into on September 15, 2015. Pursuant to the amendment, the Company agrees to pay the Supplier approximately $0.1 million in exchange for eliminating the minimum annual order of material and/or services and any other amounts due Supplier. The payment of $0.1 million will be made over the 18 months following the date of the amendment.

EXHIBIT INDEX

Exhibit	Description
3.1	Sixth Amended and Restated Certificate of Incorporation (filed as Exhibit 3.1 to the Registrant's Current Report on Form 8-K as filed on December 8, 2014, and incorporated herein by reference)
3.2	Amended and Restated Bylaws (filed as Exhibit 3.2 to the Registrant's Current Report on Form 8-K as filed on December 8, 2014, and incorporated herein by reference)
3.3	Certificate of Designation of Preferences, Rights and Limitations of Series A Convertible Preferred Stock of Histogenics Corporation (filed as Exhibit 3.3 to the Registrant's Current Report on Form 8-K as filed on September 16, 2016, and incorporated herein by reference)
4.1	Specimen stock certificate evidencing the shares of common stock (filed as Exhibit 4.1 to Amendment No. 3 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on November 26, 2014, and incorporated herein by reference)
4.2	Second Amended and Restated Investors' Rights Agreement dated as of December 18, 2013 (filed as Exhibit 4.2 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
4.3	Second Amended and Restated Stockholders' Agreement dated as of December 18, 2013 (filed as Exhibit 4.3 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
4.4	Warrant to Purchase Common Stock dated July 9, 2014 issued to Silicon Valley Bank (filed as Exhibit 4.4 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
4.5	Amended and Restated Royalty Agreement dated as of October 14, 2014 (filed as Exhibit 4.5 to Amendment No. 1 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on November 7, 2014, and incorporated herein by reference)
4.6	Securities Purchase Agreement dated September 15, 2016 (filed as Exhibit 10.34 to the Registrant's Current Report on Form 8-K as filed on September 16, 2016, and incorporated herein by reference)
4.7	Registration Rights Agreement dated September 29, 2016 (filed as Exhibit 10.35 to the Registrant's Current Report on Form 8-K as filed on September 29, 2016, and incorporated herein by reference)
4.8	Form of Warrant to Purchase Common Stock (filed as Exhibit 4.6 to the Registrant's Current Report on Form 8-K as filed on September 29, 2016, and incorporated herein by reference)
4.9	Warrant to Purchase Common Stock of Histogenics Corporation issued to H.C. Wainwright & Co., LLC dated September 29, 2016 (filed as Exhibit 4.7 to the Registrant's Current Report on Form 8-K as filed on September 29, 2016, and incorporated herein by reference)
10.1	Form of Indemnity Agreement for directors and officers (filed as Exhibit 10.1 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.2+	2012 Equity Incentive Plan, as amended, and form of option agreement thereunder (filed as Exhibit 10.6 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.3+	2013 Equity Incentive Plan (filed as Exhibit 10.3 to the Registrant's Current Report on Form 8-K as filed on May 4, 2016, and incorporated herein by reference)

Exhibit	Description
10.3A+	Amendment No. 1 to 2013 Equity Incentive Plan (filed as Exhibit 10.3A to the Registrant's Registration Statement on Form S-8 (SEC File No. 333-212358), as filed on June 30, 2016, and incorporated herein by reference)
10.4+	2013 Employee Stock Purchase Plan (filed as Exhibit 10.4 to the Registrant's Current Report on Form 8-K as filed on May 4, 2016, and incorporated herein by reference)
10.5†	License Agreement dated as of May 12, 2005 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.10 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.6†	Amendment to License Agreement dated as of August 31, 2007 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.11 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.7†	Second Amendment to License Agreement dated as of January 1, 2008 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.12 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.8†	Third Amendment to License Agreement dated as of April 15, 2008 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.13 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.9†	Fourth Amendment to License Agreement dated as of November 1, 2008 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.14 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.10†	Fifth Amendment to License Agreement dated as of August 6, 2010 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.15 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.11†	Reinstatement Agreement and Sixth Amendment to License Agreement dated as of February 8, 2011 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.16 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.12†	Seventh Amendment to License Agreement dated as of March 31, 2011 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.17 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.13†	Eighth Amendment to License Agreement dated as of June 29, 2012 among the Registrant and Angiotech Pharmaceuticals (US), Inc. and Angiodevice International GmbH (filed as Exhibit 10.18 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.14†	Paid-up License Agreement dated as of March 6, 2013 between the Registrant and Koken Co., Ltd. (filed as Exhibit 10.19 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)

Exhibit	Description
10.15†	Agreement dated as of June 22, 2012 between the Registrant and Purpose Co., Ltd. f/k/a Takagi Sangyo Co. Ltd. and f/k/a Takagi Industrial Co., Ltd. (filed as Exhibit 10.20 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.16†	Exclusive Agreement dated as of April 15, 2001 between the Registrant and The Board of Trustees of The Leland Stanford Junior University (filed as Exhibit 10.21 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.17	First Amendment to Exclusive Agreement dated as of October 26, 2005 between the Registrant and The Board of Trustees of The Leland Stanford Junior University (filed as Exhibit 10.22 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.18†	Second Amendment to Exclusive Agreement dated as of January 15, 2006 between the Registrant and The Board of Trustees of The Leland Stanford Junior University (filed as Exhibit 10.23 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.19†	Amendment No. 3 to the License Agreement Effective 4/15/2001 dated as of May 1, 2009 between the Registrant and The Board of Trustees of The Leland Stanford Junior University (filed as Exhibit 10.24 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.20	Amendment No. 4 to the License Agreement Effective 4/15/2001 dated as of April 29, 2010 between the Registrant and The Board of Trustees of The Leland Stanford Junior University (filed as Exhibit 10.25 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.21	Lease Agreement dated of June 9, 2006 between the Registrant and Intercontinental Fund III 830 Winter Street LLC (filed as Exhibit 10.28 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.22	First Amendment to Lease dated as of October 1, 2009 between the Registrant and Intercontinental Fund III 830 Winter Street LLC (filed as Exhibit 10.29 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.23†	Collagen Technology Transfer Agreement dated as of April 15, 2014 between the Registrant and Advanced BioMatrix, Inc. (filed as Exhibit 10.31 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.24+	Employment Agreement dated April 26, 2014 between the Registrant and Adam Gridley (filed as Exhibit 10.32 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.25	Lease Agreement dated as of June 2, 2014 between the Registrant and ARE-60 Westview, LLC (filed as Exhibit 10.33 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.26	Loan and Security Agreement dated as of July 9, 2014 between the Registrant and Silicon Valley Bank (filed as Exhibit 10.34 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)

Exhibit	Description
10.27†	Exclusive Channel Collaboration Agreement dated as of September 30, 2014 between the Registrant and Intrexon Corporation (filed as Exhibit 10.35 to the Registrant's Registration Statement on Form S-1 (SEC File No. 333-199202), as filed on October 7, 2014, and incorporated herein by reference)
10.28+	Employment Agreement by and between the Registrant and Jonathan Lieber, entered into as of June 17, 2015 (filed as Exhibit 10.38 to the Registration's Current Report on Form 8-K as filed on June 22, 2015, and incorporated herein by reference)
10.29+	Amended and Restated Employment Agreement by and between Histogenics Corporation and Stephen Kennedy dated July 29, 2015 (filed as Exhibit 10.39 to the Registration's Current Report on Form 8-K as filed on July 30, 2015, and incorporated herein by reference)
10.30+	Amended and Restated Compensation Program for Non-Employee Directors adopted on June 24, 2015 (filed as Exhibit 10.32 to the Registrant's Annual Report on Form 10-K as filed on March 10, 2016, and incorporated herein by reference)
10.31†	First Amendment to License Agreement, dated May 9, 2016, between the Registrant and Purpose Co., Ltd., f/k/a Takagi Sangyo Co. Ltd. (filed as Exhibit 10.33 to the Registrant's Quarterly Report on Form 10-Q as filed on August 11, 2016, and incorporated herein by reference)
10.32+*	Employment Agreement by and between the Registrant and Gloria Matthews, DVM, Ph.D., DACVS, entered into as of July 14, 2015
21.1	List of Subsidiaries (filed as Exhibit 21.1 to the Registrant's Annual Report on Form 10-K as filed on March 27, 2015, and incorporated herein by reference)
23.1*	Consent of Grant Thornton LLP, independent registered public accounting firm
31.1*	Certification of the Chief Executive Officer, as required by Section 302 of the Sarbanes-Oxley Act of 2002
31.2*	Certification of the Chief Financial Officer as required by Section 302 of the Sarbanes-Oxley Act of 2002
32.1*	Certifications of the Chief Executive Officer and Chief Financial Officer as required by 18 U.S.C. 1350
101.INS*	XBRL Instance Document
101.SCH*	XBRL Taxonomy Extension Schema Document
101.CAL*	XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF*	XBRL Taxonomy Extension Definition Linkbase Document
101.LAB*	XBRL Taxonomy Extension Label Linkbase Document
101.PRE*	XBRL Taxonomy Extension Presentation Linkbase Document

\+ Indicates management contract or compensatory plan.
† Confidential treatment has been granted with respect to certain portions of this document.
* Filed herewith

Exhibit 10.32

EMPLOYMENT AGREEMENT

This Employment Agreement (this "Agreement") is entered into as of July 14, 2015, by and between Gloria Matthews (the "Employee") and Histogenics Corporation, a Delaware corporation (the "Company").

1. Duties and Scope of Employment.

(a) **Position**. For the term of the Employee's employment under this Agreement (the "Employment"), the Company agrees to employ the Employee in the position of Chief Medical Officer. The Employee shall report to the Company's Chief Executive Officer.

(b) **Obligations to the Company**. During the Employee's Employment, the Employee (i) shall devote her full business efforts and time to the Company, (ii) shall not engage in any other employment, consulting or other business activity that would create a conflict of interest with the Company, (iii) shall not assist any person or entity in competing with the Company or in preparing to compete with the Company and (iv) shall comply with the Company's policies and rules, as they may be in effect from time to time.

(c) **No Conflicting Obligations**. The Employee represents and warrants to the Company that the Employee is under no obligations or commitments, whether contractual or otherwise, that are inconsistent with the Employee's obligations under this Agreement. The Employee represents and warrants that the Employee will not use or disclose, in connection with his Employment, any trade secrets or other proprietary information or intellectual property in which the Employee or any other person has any right, title or interest and that her Employment will not infringe or violate the rights of any other person. The Employee represents and warrants to the Company that the Employee has returned all property and confidential information belonging to any prior employer.

(d) **Commencement Date**. The Employee shall commence full-time Employment on July15, 2015 (the "Commencement Date").

(e) **Definitions**. Certain capitalized terms are defined in Section 10.

2. **Cash and Incentive Compensation**.

(a) **Salary**. The Company shall pay the Employee as compensation a base salary at a gross annual rate of not less than $330,000. Such salary shall be payable in accordance with the Company's standard payroll procedures.

(b) **Incentive Bonuses**. The Employee shall be eligible for an annual incentive bonus with a target amount equal to 35% of the Employee's Base Salary. Such bonus (if any) shall be awarded based on objective or subjective criteria established in advance by the Board or the Compensation Committee of the Board. The determinations of the Board or its Compensation Committee with respect to such bonus shall be final and binding. Any incentive bonus for a fiscal year shall in no event be paid later than 90 days after the close of such fiscal year. The Employee shall not be entitled to an incentive bonus if he is not employed by the

Company on the date when such bonus is payable. The amount of any incentive bonus for the fiscal year in which the Employee's Employment begins shall be prorated, based on the number of days of Employment during such fiscal year.

(c) **Stock Options**.

Subject to the approval of the Board or the Compensation Committee of the Board, the Company shall grant the Employee an option to purchase 120,000 shares of the Company's Common Stock (the "Option"). The Option shall be granted as soon as reasonably practicable after the date of this Agreement, but in any event, no later than 90 days after the execution of this agreement by Employee. The per-share exercise price of the Option shall be equal to the fair market value per share of the Company's Common Stock on the date the Option is granted, as determined by the Board or its Compensation Committee. The term of the Option shall be 10 years, subject to earlier expiration in the event of the termination of the Employee's Employment. The grant of the Option shall be subject to the terms and conditions set forth in the Plan and in the Company's standard form of Stock Option Agreement. The Employee shall vest in 25% of the Option shares after the first 12 months of continuous service and shall vest in the remaining Option shares in equal monthly installments over the next three years of continuous service. Vesting of the Option shall accelerate in full if (i) the Company is subject to a Change in Control before the Employee's service with the Company terminates and (ii) the Employee is subject to an Involuntary Termination within 12 months after such Change in Control.

Subject to the approval of the Board or the Compensation Committee of the Board, the Company shall also grant the Employee an option to purchase 30,000 shares of the Company's Common Stock (the "Performance Option"). The Performance Option shall be granted as soon as reasonably practicable after the date of this Agreement. The per-share exercise price of the Performance Option shall be equal to the fair market value per share of the Company's Common Stock on the date the Performance Option is granted, as determined by the Board or its Compensation Committee. The term of the Performance Option shall be 10 years, subject to earlier expiration in the event of the termination of the Employee's Employment. The grant of the Performance Option shall be subject to the terms and conditions set forth in the Plan and in the Company's standard form of Stock Option Agreement. The Performance Option shall vest in full if the Company's stock price is at or above $19.92 for any consecutive 60 day period within 4 years of the Vesting Commencement Date. If the Performance Option is exercised within one year of earning the award, the executive must hold shares, issued on exercise, net of taxes until the one-year anniversary of earning the award is reached. Additionally, the shares subject to such Performance Option shall become fully vested and exercisable upon a Change in Control if the per share transaction price for such Change in Control is at or above $19.92; the post-vesting holding period described above shall be waived if the Performance Option is accelerated upon a Change in Control.

3. **Vacation and Employee Benefits**. During her Employment, the Employee shall be eligible for paid vacations in accordance with the Company's vacation policy, as it may be amended from time to time; provided, however, that in no event will the Employee be entitled to fewer than three weeks' paid vacation per year. During her Employment, the Employee shall also be eligible to participate in the employee benefit plans maintained by the Company, subject in each case to the generally applicable terms and conditions of the plan in question and to the determinations of any person or committee administering such plan.

4. **Business Expenses**. During her Employment, the Employee shall be authorized to incur necessary and reasonable travel, entertainment and other business expenses in connection with the Employee's duties hereunder. The Company shall reimburse the Employee for such expenses upon presentation of an itemized account and appropriate supporting documentation, all in accordance with the Company's generally applicable policies. Any reimbursement shall (a) be paid promptly but not later than 30 days after the month in which the expense was incurred, (b) not be affected by any other expenses that are eligible for reimbursement in any calendar year and (c) not be subject to liquidation or exchange for another benefit.

5. **Term of Employment**.

(a) **Employment at Will**. The Employee's Employment with the Company shall be "at will," meaning that either the Employee or the Company shall be entitled to terminate the Employee's Employment at any time and for any reason, with or without Cause. Any contrary representations that may have been made to the Employee shall be superseded by this Agreement. This Agreement shall constitute the full and complete agreement between the Employee and the Company on the "at will" nature of the Employee's Employment, which may only be changed in an express written agreement signed by the Employee and a duly authorized officer of the Company. The termination of the Employee's Employment shall not limit or otherwise affect her obligations under Section 7 below.

(b) **Rights upon Termination**. Except as expressly provided in Section 6 below, upon the termination of the Employee's Employment, the Employee shall be entitled only to the compensation, benefits and expense reimbursements that the Employee has earned under this Agreement before the effective date of the termination. The payments under this Agreement shall fully discharge all responsibilities of the Company to the Employee.

6. **Termination Benefits**.

(a) **Preconditions**. Any other provision of this Agreement notwithstanding, the remaining Subsections of this Section 6 shall not apply unless each of the following requirements is satisfied:

(i) The Employee has executed a general release of all claims in a form prescribed by the Company. The Employee shall execute and return the release on or before the date specified by the Company in the prescribed form (the "Release Deadline"). The Release Deadline shall in no event be later than 50 days after the Employee's Separation. If the Employee fails to return the release on or before the Release Deadline, or if the Employee revokes the release, then the Employee shall not be entitled to the benefits described in this Section 6.

(ii) The Employee has returned all property of the Company in the Employee's possession.

(iii) If requested by the Board, the Employee has resigned as a member of the Board and as a member of the boards of directors of all subsidiaries of the Company, to the extent applicable.

(b) **Severance Pay**. If, during the term of this Agreement, the Employee is subject to an Involuntary Termination, then the Company shall pay the Employee an amount equal to the Employee's Base Salary for a period of six months following the Separation (the "Continuation Period"). Such severance payments shall be paid at the Base Salary rate in effect at the time of the Separation and in accordance with the Company's standard payroll procedures. The severance payments shall commence on the first payroll period following expiration of any legally required revocation period and in no event later than 60 days after the Employee's Separation and, once they commence, shall include any unpaid amounts accrued from the date of the Employee's Separation. However, if the 60-day period described in the preceding sentence spans two calendar years, then the payments shall in any event begin on the first payroll period following expiration of the 60 day period in the second calendar year. In addition, The Company shall pay the Employee any accrued benefits, including earned but unpaid salary, earned but unpaid incentive bonuses, accrued and unused vacation time, unreimbursed business expenses, and any vested benefits under the Company's benefit plans.

(c) **Health Insurance**. If, during the period of Employment, the Employee is subject to an Involuntary Termination, and if the Employee elects to continue health insurance coverage under the Consolidated Omnibus Budget Reconciliation Act ("COBRA") for the Employee and, if applicable, her dependents following the Separation, then the Company shall pay the employer portion of the monthly premium under COBRA for the Employee and, if applicable, such dependents until the earliest of (i) the close of the Continuation Period, (ii) the expiration of the Employee's continuation coverage under COBRA or (iii) the date when the Employee receives substantially equivalent health insurance coverage in connection with new employment or self-employment.

7. **Confidential Information and Intellectual Property Assignment Agreement**. The Employee shall enter into the Company's standard form of Confidential Information and Intellectual Property Assignment Agreement, which is incorporated herein by this reference.

8. **Successors**.

(a) **Company's Successors**. This Agreement shall be binding upon any successor (whether direct or indirect and whether by purchase, lease, merger, consolidation, liquidation or otherwise) to all or substantially all of the Company's business and/or assets. For all purposes under this Agreement, the term "Company" shall include any successor to the Company's business and/or assets which becomes bound by this Agreement.

(b) **Employee's Successors**. This Agreement and all rights of the Employee hereunder shall inure to the benefit of, and be enforceable by, the Employee's personal or legal representatives, executors, administrators, successors, heirs, distributees, devisees and legatees.

9. **Definitions**. The following terms shall have the meaning set forth below wherever they are used in this Agreement:

(a) **Base Salary**. The term "Base Salary" shall mean the annual compensation specified in Section 2(a), together with any increases in such compensation that the Company may grant from time to time.

(b) **Cause**. The term "Cause" shall mean a good faith determination by the Board of any of the following:

(i) An unauthorized use or disclosure by the Employee of the Company's confidential information or trade secrets, which use or disclosure causes material harm to the Company;

(ii) A material breach by the Employee of any agreement between the Employee and the Company after receiving written notification of such failure from the Board specifying such breach and after the expiration of a 45 day opportunity to cure;

(iii) A material failure by the Employee to comply with the Company's written policies or rules after receiving written notification of such failure from the Board specifying such failure and after the expiration of a 45 day opportunity to cure;

(iv) The sale, possession or use of illegal drugs by the Employee or habitual intoxication of the Employee on the premises of the Company or a customer or business partner of the Company or while conducting Company business;

(v) The Employee's conviction of, or plea of "guilty" or "no contest" to, a felony under the laws of the United States or any State thereof;

(vi) The Employee's gross negligence or willful misconduct in the course of performing service to the Company;

(vii) A continuing failure by the Employee to perform reasonably assigned duties after receiving written notification of such failure from the Board specifying such failure and after the expiration of a 45-day opportunity to cure ; or

(viii) A failure by the Employee to cooperate in good faith with a governmental or internal investigation of the Company or its directors, officers or employees, if the Company has requested the Employee's cooperation.

(c) **Change in Control**. The term "Change in Control" shall have the meaning ascribed to it in the Plan.

(d) **Code**. The term "Code" shall mean the Internal Revenue Code of 1986, as amended.

(e) **Involuntary Termination**. The term "Involuntary Termination" shall mean either (a) the Employee's Termination Without Cause or (b) the Employee's Resignation for Good Reason.

(f) **Plan**. The term "Plan" shall mean the Histogenics Corporation 2012 Equity Incentive Plan or the Histogenics Corporation 2013 Equity Incentive Plan.

(g) "**Resignation for Good Reason**" means a Separation as a result of the Employee's resignation after one of the following conditions has come into existence without the Employee's consent:

(i) A material reduction in the Employee's Base Salary or incentive compensation;

(ii) A change in the Employee's title or position with the Company or reporting structure that materially reduces the Employee's level of authority or responsibility; or

(iii) A relocation of the Employee's principal workplace by more than 40 miles.

A Resignation for Good Reason shall not be deemed to have occurred unless the Employee gives the Company written notice of the condition within 15 days after the condition comes into existence and the Company fails to remedy the condition within 15 days after receiving the Employee's written notice.

(h) **Separation**. The term "Separation" shall mean a "separation from service," as defined in the regulations under Section 409A of the Code.

(i) "**Termination Without Cause**" means a Separation as a result of a termination of the Employee's employment by the Company without Cause, provided the Employee is willing and able to continue performing services within the meaning of Treasury Regulation 1.409A-1(n)(1).

10. **Indemnification and D&O Insurance.** The Employee shall enter into the Company's standard Indemnification Agreement for its directors and officers. During the term of the Employee's Employment, the Employee will be named as an insured on the directors' and officers' liability insurance policy currently maintained, or as may be maintained by the Company from time to time, at the same level of coverage applicable to active directors and officers.

11. **Miscellaneous Provisions**.

(a) **Notice**. Notices and all other communications contemplated by this Agreement shall be in writing and shall be deemed to have been duly given when personally delivered, when delivered by FedEx with delivery charges prepaid, or when mailed by U.S.

registered or certified mail, return receipt requested and postage prepaid. In the case of the Employee, mailed notices shall be addressed to the Employee at the home address that he most recently communicated to the Company in writing. In the case of the Company, mailed notices shall be addressed to its corporate headquarters, and all notices shall be directed to the attention of its Secretary.

(b) **Modifications and Waivers**. No provision of this Agreement shall be modified, waived or discharged unless the modification, waiver or discharge is agreed to in writing and signed by the Employee and by an authorized officer or director of the Company (other than the Employee). No waiver by either party of any breach of, or of compliance with, any condition or provision of this Agreement by the other party shall be considered a waiver of any other condition or provision or of the same condition or provision at another time.

(c) **Whole Agreement**. This Agreement supersedes all other agreements, representations or understandings (whether oral or written and whether express or implied) that are not expressly set forth in this Agreement have been made or entered into by either party with respect to the subject matter hereof. This Agreement and the Confidential Information and Intellectual Property Assignment Agreement contain the entire understanding of the parties with respect to the subject matter hereof.

(d) **Tax Matters**. All payments made under this Agreement shall be subject to reduction to reflect taxes or other charges required to be withheld by law. For purposes of Section 409A of the Code, each periodic salary continuation payment under Section 6(b) is hereby designated as a separate payment. If the Company determines that the Employee is a "specified employee" under Section 409A(a)(2)(B)(i) of the Code and the regulations thereunder at the time of her Separation, then (i) the salary continuation payments under Section 6(b), to the extent that they are subject to Section 409A of the Code, shall commence on the first business day following (A) expiration of the six-month period measured from the Employee's Separation or (B) the date of the Employee's death and (ii) the installments that otherwise would have been paid prior to such date shall be paid in a lump sum when such salary continuation payments commence. The Company shall not have a duty to design its compensation policies in a manner that minimizes the Employee's tax liabilities, and the Employee shall not make any claim against the Company or the Board related to tax liabilities arising from the Employee's compensation.

(e) **Choice of Law and Severability**. This Agreement shall be interpreted in accordance with the laws of the Commonwealth of Massachusetts (except their provisions governing the choice of law). If any provision of this Agreement becomes or is deemed invalid, illegal or unenforceable in any applicable jurisdiction by reason of the scope, extent or duration of its coverage or any other reason, then such provision shall be deemed amended to the minimum extent necessary to conform to applicable law so as to be valid and enforceable or, if such provision cannot be so amended without materially altering the intention of the parties, then such provision shall be stricken and the remainder of this Agreement shall continue in full force and effect. If any provision of this Agreement is rendered illegal by any present or future statute, law, ordinance or regulation (collectively the "Law"), then such provision shall be curtailed or limited only to the minimum extent necessary to bring such provision into compliance with the Law. All the other terms and provisions of this Agreement shall continue in full force and effect without impairment or limitation.

(f) **No Assignment**. This Agreement and all rights and obligations of the Employee hereunder are personal to the Employee and may not be transferred or assigned by the Employee at any time. The Company may assign its rights under this Agreement to any entity that assumes the Company's obligations hereunder in connection with any sale or transfer of all or a substantial portion of the Company's assets to such entity.

(g) **Counterparts**. 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.

[Remainder of page left blank intentionally.]

IN WITNESS WHEREOF, each of the parties has executed this Agreement, in the case of the Company by its duly authorized officer, as of the day and year first above written.

/s/ Gloria Matthews
Gloria Matthews

HISTOGENICS CORPORATION

By: /s/ Adam Gridley
Title: CEO

Exhibit 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC

We have issued our report dated March 16, 2017, with respect to the consolidated financial statements included in the Annual Report of Histogenics Corporation on Form 10-K for the year ended December 31, 2016. We consent to the incorporation by reference of said report in the Registration Statements of Histogenics Corporation on Form S-3 (File No. 333-213980) and on Forms S-8 (File No. 333-201552, File No. 333-210075, and File No. 333-212358).

/s/ GRANT THORNTON LLP

Boston, Massachusetts
March 16, 2017

CERTIFICATION

I, Adam Gridley, certify that:

1. I have reviewed this annual report on Form 10-K of Histogenics Corporation;

2. Based on my knowledge, this report does not contain any untrue statements of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the consolidated financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a. all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 16, 2017

/s/ Adam Gridley

Adam Gridley
President and Chief Executive Officer
(Principal Executive Officer)

EXHIBIT 31.2

CERTIFICATION

I, Jonathan Lieber, certify that:

1. I have reviewed this annual report on Form 10-K of Histogenics Corporation;

2. Based on my knowledge, this report does not contain any untrue statements of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the consolidated financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   a. designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   b. designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   c. evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   d. disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting.

5. The registrant's other certifying officer(s) and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

   a. all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   b. any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: March 16, 2017

/s/ Jonathan Lieber

Jonathan Lieber
Chief Financial Officer
(Principal Financial and Accounting Officer)

EXHIBIT 32.1

CERTIFICATION

In connection with the Annual Report of Histogenics Corporation (the "Registrant") on Form 10-K for the annual period ended December 31, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), the undersigned, Adam Gridley, President, Chief Executive Officer and Director of the Registrant, and Jonathan Lieber, Chief Financial Officer of the Registrant, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to their respective knowledge:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Registrant.

Date: March 16, 2017

/s/ Adam Gridley

Adam Gridley
President and Chief Executive Officer
(Principal Executive Officer)

Date: March 16, 2017

/s/ Jonathan Lieber

Jonathan Lieber
Chief Financial Officer
(Principal Financial and Accounting Officer)

This certification is made solely for the purposes of 18 U.S.C. Section 1350, subject to the knowledge standard contained therein, and not for any other purpose. A signed original of this written statement required by Section 906 has been provided to the Registrant and will be retained by the Registrant and furnished to the United States Securities and Exchange Commission or its staff upon request.

This certification accompanies the Form 10-K to which it relates, is not deemed filed with the Securities and Exchange Commission and is not to be incorporated by reference into any filing of the Registrant under the Securities Act of 1933 or the Securities Exchange Act of 1934, each as amended (whether made before or after the date of the Form 10-K), irrespective of any general incorporation language contained in such filing.