

Biostage, Inc.

Form S-1

January 04, 2017

As filed with the Securities and Exchange Commission on January 3, 2017

Registration No. 333-

UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM S-1

REGISTRATION STATEMENT

UNDER

THE SECURITIES ACT OF 1933

Biostage, Inc.

(Exact name of registrant as specified in its Charter)

Delaware	3841	45-5210462
(State or other jurisdiction of	(Primary Standard Industrial	(I.R.S.
incorporation or organization)	Classification Code Number)	Employer
		Identification
		No.)

84 October Hill Road, Suite 11, Holliston, Massachusetts 01746

(774) 233-7300

(Address, including zip code, and telephone number, including area code, of registrant's principal executive office)

James McGorry
President and Chief Executive Officer
Biostage, Inc.
84 October Hill Road, Suite 11, Holliston, Massachusetts 01746
(774) 233-7300

(Name, address, including zip code, and telephone number, including area code, of agent for service)

With copies to:

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Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this registration statement.

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, 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

CALCULATION OF REGISTRATION FEE

Title of each Class of Securities to be Registered	Proposed Maximum Aggregate Offering Price(1)	Amount of Registration Fee
Common Stock, par value \$0.01 per share (2)		
Series C Convertible Preferred Stock, par value \$0.01 per share (2)		
Common Stock issuable upon conversion of Preferred Stock (2)		
Warrants to purchase Common Stock (2)		
Common Stock issuable upon exercise of Warrants (2)		
Placement agent's warrants (3)		
Common stock issuable upon exercise of placement agent's warrants (3)		
Total	\$8,000,000	\$928 (4)

(1) Estimated solely for the purpose of computing the amount of the registration fee pursuant to Rule 457(o) under the Securities Act of 1933, as amended. This Registration Statement also relates to the Rights to purchase shares of Series A Junior Participating Cumulative Preferred Stock of the Registrant which are attached to all shares of Common Stock pursuant to the terms of the Registrant's Shareholder Rights Agreement dated October 31, 2008, as amended by Amendment No. 1 dated February 12, 2015. Until the occurrence of certain prescribed events, the Rights are not exercisable, are evidenced by the certificates for the Common Stock and will be transferred only with such stock.

(2) Pursuant to Rule 416 under the Securities Act, the securities being registered hereunder include such indeterminate number of additional shares of common stock as may be issued after the date hereof as a result of stock splits, stock dividends or similar transactions.

(3) Represents warrants to purchase a number of shares of common stock equal to 5% of the common stock sold in this offering (including the number of shares of common stock issuable upon conversion of shares of Series C Preferred Stock sold in this offering but excluding any shares of common stock underlying the warrants issued in this offering).

(4) Calculated in accordance with Rule 457(o) of the Securities Act at the statutory rate of \$115.90 per \$1,000,000 of securities registered.

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

SUBJECT TO COMPLETION, DATED JANUARY 3, 2017

The information in this preliminary prospectus is not complete and may be changed. These securities may not be sold until the registration statement filed with the Securities and Exchange Commission is effective. This preliminary prospectus is not an offer to sell nor does it seek an offer to buy these securities in any jurisdiction where the offer or sale is not permitted.

PRELIMINARY PROSPECTUS

**Up to \$8,000,000 in Shares of Common Stock,
Warrants to Purchase Shares of Common Stock and
Shares of Series C Convertible Preferred Stock**

We are offering up to shares of common stock, together with warrants to purchase shares of common stock at a purchase price of (and the shares issuable from time to time upon exercise of the warrants) pursuant to this prospectus. The shares and warrants will be separately issued but will be purchased together in this offering. Each warrant will have an exercise price of per share, will be exercisable upon issuance and will expire years from the date of issuance.

We are also offering to those purchasers, whose purchase of shares of common stock in this offering would result in the purchaser, together with its affiliates and certain related parties, beneficially owning more than 4.99% of our outstanding common stock following the consummation of this offering, the opportunity to purchase, if they so choose, in lieu of the shares of our common stock that would result in ownership in excess of 4.99%, shares of Series C Convertible Preferred Stock ("Series C Preferred Stock"), convertible at any time at the holder's option into a number of shares of common stock equal to \$1,000 divided by \$ (the "Conversion Price"), at a public offering price of \$1,000 per share of Series C Preferred Stock. Each share of Series C Preferred Stock is being sold together with the same warrants described above being sold with each share of common stock. Each share of Series C Preferred Stock entitles its holder to receive shares of common stock upon conversion, subject to certain adjustments.

Our common stock is listed on the NASDAQ Capital Market under the symbol “BSTG.” On December 30, 2016, the closing price for our common stock, as reported on the NASDAQ Capital Market, was \$0.89 per share. The warrants and any shares of Series C Preferred Stock that we issue are not and will not be listed for trading on the NASDAQ Capital Market.

Investing in our securities involves a high degree of risk. You should review carefully the risks and uncertainties described under the heading “Risk Factors” contained in this prospectus beginning on page 8 and any applicable prospectus supplement, and under similar headings in the other documents that are incorporated by reference into this prospectus.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED IF THIS PROSPECTUS IS ACCURATE, TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

	Per Share of Common Stock and Warrant	Per Share of Series C Preferred Stock and Warrant	Total
Public offering price			
Placement agent fees ⁽¹⁾			
Proceeds, before expenses, to us			

We have also agreed to (i) grant warrants to purchase shares of common stock to the placement agent as described under “Plan of Distribution” on page 25 of this prospectus, (ii) pay the placement agent a management fee equal to 1% of the gross proceeds raised in this offering and (iii) pay the placement agent a reimbursement for out of pocket expenses in connection with marketing the transaction in the amount of up to \$45,000 and a reimbursement for legal fees and expenses of the placement agent in the amount of \$100,000. For additional information about the compensation to be paid to the placement agent, see “Plan of Distribution.”

We have retained H.C. Wainwright & Co., LLC as our exclusive placement agent to use its reasonable best efforts to solicit offers to purchase the securities in this offering. The placement agent has no obligation to buy any of the securities from us or to arrange for the purchase or sale of any specific number or dollar amount of the securities.

We expect to deliver the shares and the warrants to purchasers in this offering on or about _____, 2017.

Rodman & Renshaw
a unit of H.C. Wainwright & Co.

The date of this prospectus is _____, 2017.

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We have not, and the placement agent has not, authorized anyone to provide any information or to make any representations other than those contained in this prospectus or in any prospectus supplement or free writing prospectuses prepared by or on behalf of us or to which we have referred you. We take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. This prospectus is an offer to sell only the shares offered hereby, and only under circumstances and in jurisdictions where it is lawful to do so. The information contained in this prospectus or in any applicable prospectus supplement or free writing prospectus is current only as of its date, regardless of its time of delivery or any sale of our securities. Our business, financial condition, results of operations and prospects may have changed since that date.

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

ABOUT THIS PROSPECTUS

You should rely only on the information contained in or incorporated by reference into this prospectus and any prospectus supplement or free writing prospectus authorized by us. To the extent the information contained in this prospectus differs or varies from the information contained in any document filed prior to the date of this prospectus and incorporated by reference, the information in this prospectus will control. We have not authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. The information in this prospectus is accurate only as of the date it is presented. You should read this prospectus, the documents incorporated by reference described in the section entitled “Incorporation of Certain Information by Reference” into this prospectus, and any prospectus supplement or free writing prospectus that we have authorized for use in connection with this offering, in their entirety before investing in our securities.

We are offering to sell, and seeking offers to buy, the securities offered by this prospectus only in jurisdictions where offers and sales are permitted. The distribution of this prospectus and the offering of the securities offered by this prospectus in certain jurisdictions may be restricted by law. This prospectus does not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any securities offered by this prospectus in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

PROSPECTUS SUMMARY

The following summary highlights information contained elsewhere in this prospectus. It may not contain all of the information that is important to you. You should read the entire prospectus carefully, especially the discussion regarding the risks of investing in our securities under the heading “Risk Factors,” before investing in our securities. All references to “Company” “we,” “our” or “us” refer solely to Biostage, Inc. and its subsidiaries and not to the persons who manage us or constitute our Board of Directors.

About Biostage, Inc.

We are a biotechnology company developing bioengineered organ implants based on our novel Cellframe™ technology. Our Cellframe technology is comprised of a biocompatible scaffold seeded with the patient’s own stem cells. Our platform technology is being developed to treat life-threatening conditions of the esophagus, bronchi and trachea. By focusing on these underserved patients, we hope to dramatically improve the treatment paradigm for these patients. Our unique Cellframe technology combines the clinically proven principles of tissue engineering, cell biology and material science.

We believe that our Cellframe technology may provide surgeons a new paradigm to address life-threatening conditions of the esophagus, bronchi, and trachea due to cancer, infection, trauma or congenital abnormalities. Our novel technology harnesses the body’s response and modulates it toward the healing process to restore the continuity and integrity of the organ. We are pursuing the Cellspan™ esophageal implant as our first product candidate to address esophageal atresia and esophageal cancer, and we are also developing our technology’s applications to address conditions of the bronchi and trachea.

In collaboration with world-class institutions, such as Mayo Clinic and Connecticut Children’s Medical Center, we are expecting to transition from a pre-clinical company to a clinical company in 2017. We plan to file an Investigational New Drug application (IND) with the U.S. Food and Drug Administration (FDA) for our Cellspan esophageal implant in the third quarter of 2017 and expect to begin first in human clinical trials in the fourth quarter of 2017.

Our Cellspan technology platform: how it works

Our Cellframe process begins with the collection of an adipose (fat) tissue biopsy from the patient followed by the use of standard tissue culture techniques to isolate and expand the patient's own (autologous) mesenchymal (multipotent) stem cells, or MSC. The cells are seeded onto a biocompatible, synthetic scaffold, produced to mimic the dimensions of the organ to be regenerated, and incubated in a proprietary, organ bioreactor. The scaffold is electrospun from polyurethane (PU) to form a non-woven, hollow tube. The specific microstructure of the Cellspan implant are designed to allow the cultured cells to attach to and cover the scaffold fibers.

We have conducted large-animal studies to investigate the use of the Cellspan implants for the reconstitution of the continuity and integrity of tubular shape organs, such as the esophagus and the large airways, following a full circumferential resection of a clinically relevant segment, just as would occur in a clinical setting. We announced favorable preliminary preclinical results of large-animal studies for the esophagus, bronchus and trachea in November 2015. Based on the results of those studies, we chose the esophagus to be the initial focus for our organ regeneration technology.

*Illustration of intersection of Cellspan esophageal implant and native
esophagus at time of implant*

In May 2016, we reported an update of results from additional, confirmatory pre-clinical large-animal studies. We disclosed that the studies had demonstrated in a predictive large-animal model the ability of our Cellspan organ implant to successfully stimulate the regeneration of a section of esophagus that had been surgically removed. Cellspan esophageal implants, consisting of a proprietary biocompatible synthetic scaffold seeded with the recipient animal's own stem cells, were surgically implanted in place of the esophagus section that had been removed. After the surgical full circumferential resection of a portion of the thoracic esophagus, the Cellspan implant stimulated the reconstitution of full esophageal structural integrity and continuity.

*Illustration of esophageal reconstitution over Cellspan esophageal
implant following time of implant*

Study animals were returned to a solid diet three weeks after the implantation surgery. The implants, which are intended to be in place only temporarily, were retrieved three weeks post-surgery via the animal's mouth in a non-surgical endoscopic procedure. Therefore, no synthetic material remained in the animals after the esophageal tube was reconstituted. Within 2.5 to 3 months, a complete inner epithelium layer and other specialized esophagus tissue layers were fully regenerated. Two animals in the study have not been sacrificed and are alive at nine and ten

months, respectively. These animals have demonstrated significant weight gain and appear healthy and free of any significant side effects and are receiving no specialized care.

Platform technology in life-threatening orphan indications

In December 2016, we were granted Orphan Drug Designation for our Cellspan esophageal implant by the FDA to restore the structure and function of the esophagus subsequent to esophageal damage due to cancer, injury or congenital abnormalities. Orphan drug designation provides a seven-year marketing exclusivity period against competition in the U.S. from the date of a product's approval for marketing. This exclusivity would be in addition to any exclusivity we may obtain from our patents. Additionally, orphan designation provides certain incentives, including tax credits and a waiver of the Biologics License Application fee. We also plan to apply for orphan drug designation for our Cellspan esophageal implant in Europe. Orphan drug designation in Europe provides market exclusivity in Europe for ten years from the date of the product's approval for marketing.

We are now advancing the development of our Cellframe technology, specifically a Cellspan esophageal implant, in large-animal studies with collaborators. As we believe that our recent studies provided sufficient data, we have initiated the Good Laboratory Practice (GLP) studies to demonstrate that our technology, personnel, systems and practices are sufficient for advancing into human clinical trials. In order to seek approval for the initiation of clinical trials for Biostage Cellspan esophageal implants in humans, GLP studies are required to submit an Investigational New Drug (IND) application with the FDA.

Our goal is to submit an IND filing in the third quarter of 2017.

Our product candidates are currently in development and have not yet received regulatory approval for sale anywhere in the world.

Changing the surgical treatment of Esophageal Cancer

Illustration of potential human application of
Cellsplan esophageal implant at site of
esophageal cancer (depicting implant prior to
esophageal reconstitution over implant)

According to the World Health Organization's International Agency for Research on Cancer, there are approximately 450,000 new cases of esophageal cancer worldwide each year. A portion of all patients diagnosed with esophageal cancer are treated via a surgical procedure known as an esophagectomy. The current standard of care for an esophagectomy requires a complex surgical procedure that involves moving the patient's stomach or a portion of their colon into the chest to replace the portion of esophagus resected by the removal of the tumor. These current procedures have high rates of complications, and can lead to a severely diminished quality of life and require costly ongoing care. Our Cellsplan esophageal implants aim to simplify the procedure, reduce complications, result in a better quality of life and reduce the overall cost of these patients to the healthcare system.

Congenital Abnormalities - Esophageal Atresia: a much needed focus on children

Each year, several thousand births worldwide come with a congenital abnormality known as esophageal atresia, a condition where the baby is born with an esophagus that does not extend completely from the mouth to the stomach. When a long segment of the esophagus is lacking, the current standard of care is a series of surgical procedures where surgical sutures are applied to both ends of the esophagus in an attempt to stretch them and pull them together so they can be connected at a later date. This process can take weeks and the procedure is plagued by serious complications and may carry high rates of failure. Such approach also requires, in time, at least two separate surgical interventions. Other options include the use of the child's stomach or intestine that would be pulled up into the chest to allow a connection to the mouth. We are working to develop a Cellspan esophageal implant solution to address newborns' esophageal atresia, that could potentially be life-saving or organ-sparing, or both.

Financial Conditions

We have incurred substantial operating losses since our inception, and as of September 30, 2016, we have an accumulated deficit of approximately \$33.0 million. We expect to continue to incur operating losses and negative cash flows from operations in 2017 and for the foreseeable future.

In their audit report dated March 30, 2016 included in this Form 10-K, our independent registered public accounting firm included a "going concern" qualification as to our ability to continue as a going concern. We believe that if we do not raise additional capital from outside sources in the near future, we may be forced to curtail or cease our operations. We believe that our existing cash resources will be sufficient to fund our planned operations through March 2017. Our cash requirements and cash resources will vary significantly depending upon the timing, financial and other resources that will be required to complete ongoing development and pre-clinical and clinical testing of our products as well as regulatory efforts and collaborative arrangements necessary for our products that are currently under development. In addition to development and other costs, we expect to incur capital expenditures from time to time. These capital expenditures will be influenced by our regulatory compliance efforts, our success, if any, at developing collaborative arrangements with strategic partners, our needs for additional facilities and capital equipment and the growth, if any, of our business in general. We will require additional funding to continue our anticipated operations and support our capital needs. We may seek to raise necessary funds through a combination of public or private equity offerings, debt financings, other financing mechanisms, strategic collaborations and licensing arrangements. We may not be able to obtain additional financing on terms favorable to us, if at all.

We are and we will remain an “emerging growth company” until the earliest to occur of (i) the last day of the fiscal year during which our total annual revenues equal or exceed \$1 billion (subject to adjustment for inflation), (ii) the last day of the fiscal year following the fifth anniversary of the date of our first sale of common equity securities pursuant to an effective registration statement, (iii) the date on which we have, during the previous three-year period, issued more than \$1 billion in non-convertible debt, or (iv) the date on which we are deemed a “large accelerated filer” under the Securities and Exchange Act of 1934, as amended, or the Exchange Act. For so long as we remain an “emerging growth company” as defined in the JOBS Act, we may take advantage of certain exemptions from various reporting requirements that are applicable to other public companies that are not “emerging growth companies” including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a non-binding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved.

Corporate Information

We were incorporated under the laws of the State of Delaware on May 3, 2012 by Harvard Bioscience, Inc. (“Harvard Bioscience”) to provide a means for separating its regenerative medicine business from its other businesses. On March 31, 2016, we changed our name from Harvard Apparatus Regenerative Technology, Inc. to Biostage, Inc. Our principal executive offices are located at 84 October Hill Road, Suite 11, Holliston, Massachusetts. Our telephone number is (774) 233-7300. We maintain a web site at <http://www.biostage.com>. The reference to our web site is intended to be an inactive textual reference only. The information contained on, or that can be accessed through, our web site is not a part of this prospectus.

THE OFFERING

Up to shares of our common stock

Securities offered
by us Warrants to purchase up to shares of our common stock

Up to shares of Series C Preferred Stock that are convertible into an aggregate of up to
shares of common stock, subject to certain adjustments.

Warrants The warrants will be exercisable at an initial exercise price of \$ per share. The warrants are
exercisable at any time for a period of years from the date of issuance. This prospectus also
relates to the offering of the shares of common stock issuable upon exercise of the warrants.

Series C
Preferred Stock Each share of Series C Preferred Stock is convertible at any time at the holder's option into a
number of shares of common stock equal to \$1,000 divided by the Conversion Price.
Notwithstanding the foregoing, we shall not effect any conversion of Series C Preferred Stock, to
the extent that, after giving effect to an attempted conversion, the holder of shares of Series C
Preferred Stock (together with such holder's affiliates, and any persons acting as a group together
with such holder or any of such holder's affiliates) would beneficially own a number of shares of our
common stock in excess of 4.99% of the shares of our common stock then outstanding after giving
effect to such exercise. For additional information, see "Description of Our Capital Stock—Series C
Convertible Preferred Stock" on page 18 of this prospectus.

Common stock
outstanding
before this
offering 17,108,968 shares

Common stock
outstanding after shares
this offering

Price per share of
common stock \$
and warrant

Price per share of
Series C
Preferred Stock \$
and _____
warrants

Use of proceeds We intend to use the net proceeds from this offering for research and development, including funding preclinical and clinical trials relating to the Cellframe™ technology, business development, sales and marketing, capital expenditures, working capital and other general corporate purposes. See "Use of Proceeds" on page 13.

NASDAQ BSTG. We do not plan on applying to list the warrants or the Series C Preferred Stock on
Capital Market NASDAQ, any national securities exchange or any other nationally recognized trading system.
symbol for Without an active trading market, the liquidity of the warrants and Series C Preferred Stock will be
common stock limited.

Risk factors This investment involves a high degree of risk. See the information contained in or incorporated by
reference under "Risk Factors" beginning on page 8 of this prospectus and in the documents
incorporated by reference into this prospectus.

The number of shares of our common stock to be outstanding after this offering is based on 17,108,968 shares of our common stock outstanding as of December 30, 2016 and assumes the conversion of all shares of Series C Preferred Stock being offered in this offering into an aggregate of shares of common stock, but does not include, as of such date:

· 3,878,082 shares issuable upon exercise of outstanding stock options;

· 268 shares issuable pursuant to outstanding deferred stock awards of restricted stock units;

· 1,560,284 shares issuable upon exercise of outstanding warrants to purchase shares of our common stock;

· 2,036,994 shares available for future grants under our 2013 Equity Incentive Plan and our Employee Stock Purchase Plan;

· _____ shares of common stock issuable upon the exercise of warrants to be issued to investors in this offering at an exercise price of \$ _____ per share; and

· _____ shares of common stock issuable upon exercise of warrants to be issued to the placement agent as described in “Plan of Distribution.”

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risks described herein and in the documents incorporated by reference in this prospectus, as well as other information we include or incorporate by reference into this prospectus, before making an investment decision. In particular, you should consider the risk factors under the heading “Risk Factors” included in our most recent Annual Report on Form 10-K, as may be revised or supplemented by our subsequent Quarterly Reports on Form 10-Q or Current Reports on Form 8-K, each of which are on file with the SEC and are incorporated herein by reference, and which may be amended, supplemented or superseded from time to time by other reports we file with the SEC in the future. Our business, financial condition or results of operations could be materially adversely affected by the materialization of any of these risks. The trading price of our securities could decline due to the materialization of any of these risks, and you may lose all or part of your investment. This prospectus and the documents incorporated herein by reference also contain forward-looking statements that involve risks and uncertainties. Actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including the risks described herein and in the documents incorporated herein by reference.

We have broad discretion to determine how to use the proceeds raised in this offering, and we may not use the proceeds effectively.

Our management will have broad discretion over the use of proceeds from this offering, and we could spend the proceeds from this offering in ways with which you may not agree or that do not yield a favorable return. We intend to use the net proceeds from this offering for research and development, including funding preclinical and clinical trials relating to the Cellframe™ technology, business development, sales and marketing, capital expenditures, working capital and other general corporate purposes. If we do not invest or apply the proceeds of this offering in ways that improve our operating results, we may fail to achieve expected financial results, which could cause our stock price to decline.

You will experience immediate and substantial dilution in the net tangible book value per share of the common stock you purchase.

Since the price per share of our common stock being offered is substantially higher than the net tangible book value per share of our common stock, you will suffer immediate dilution in the net tangible book value of the common stock you purchase in this offering. After giving effect to the sale of shares of our common stock in this offering at the offering price of \$ per share, and after deducting the placement agent fees and expenses and estimated offering expenses payable by us, you will experience immediate dilution of \$ per share, representing the difference between our net tangible book value per share as of September 30, 2016 after giving effect to this offering and the offering price. See the section entitled “Dilution” below for a more detailed discussion of the dilution you will incur if you purchase the common stock in this offering.

You will experience immediate and substantial dilution in the net tangible book value per share of the Series C Preferred Stock you purchase.

Since the price per share of our Series C Preferred Stock being offered is substantially higher than the net tangible book per share of our underlying common stock, you will suffer substantial dilution in the net tangible book value of the shares that you purchase in this offering. Based on an assumed offering price to the public of \$ per share, if you purchase Series C Preferred Stock in this offering, you will suffer immediate and substantial dilution of \$ per share in the net tangible book value of the shares of common stock underlying the Series C Preferred Stock. See the section entitled “Dilution” below for a more detailed discussion of the dilution you will incur if you purchase Series C Preferred Stock in this offering.

The issuance of additional equity securities may negatively impact the trading price of our common stock.

We have issued equity securities in the past, will issue equity securities in this offering and expect to continue to issue equity securities to finance our activities in the future. In addition, outstanding options and warrants to purchase our common stock may be exercised and additional options and warrants may be issued, resulting in the issuance of additional shares of common stock. The issuance by us of additional equity securities, including the shares of common stock issuable upon exercise of the warrants issued by us in this offering, would result in dilution to our stockholders, and even the perception that such an issuance may occur could have a negative impact on the trading price of our common stock.

There is no public market for the warrants to purchase shares of our common stock being offered by us in this offering.

There is no established public trading market for the warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply to list the warrants on any national securities exchange or other nationally recognized trading system, including the NASDAQ Capital Market. Without an active market, the liquidity of the warrants will be limited.

The warrants are speculative in nature.

The warrants do not confer any rights of common stock ownership on its holders, such as voting rights or the right to receive dividends, but rather merely represent the right to acquire shares of common stock at a fixed price for a limited period of time. Specifically, commencing on the date of issuance, holders of the warrants may exercise their right to acquire the common stock and pay an exercise price of \$ per share, subject to certain adjustments, prior to ___ years from the date of issuance, after which date any unexercised warrants will expire and have no further value. Moreover, following this offering, the market value of the warrants, if any, is uncertain and there can be no assurance that the market value of the warrants will equal or exceed their imputed offering price. The warrants will not be listed or quoted for trading on any market or exchange. There can be no assurance that the market price of the common stock will ever equal or exceed the exercise price of the warrants, and consequently, whether it will ever be profitable for holders of the warrants to exercise the warrants.

A substantial number of shares of our common stock may be sold in this offering, which could cause the price of our common stock to decline.

In this offering, in addition to the Series C Preferred Stock, we will sell shares of common stock representing approximately % of our outstanding common stock as of , 2017. This sale and any future sales of a substantial number of shares of our common stock in the public market, or the perception that such sales may occur, could adversely affect the price of our common stock. We cannot predict the effect, if any, that market sales of those shares of common stock or the availability of those shares of common stock for sale will have on the market price of our common stock.

A significant number of additional shares of our common stock may be issued upon the conversion of existing securities, including the Series C Preferred Stock, which issuances would substantially dilute existing stockholders and may depress the market price of our common stock.

As of December 30, 2016, there were 17,108,968 shares of common stock outstanding. In addition, shares of common stock, representing approximately % of our outstanding common stock as of December 30, 2016, will be issuable upon conversion of our Series C Preferred Stock. The issuance of any such shares of common stock would substantially dilute the proportionate ownership and voting power of existing security holders, and their issuance, or the possibility of their issuance, may depress the market price of our common stock.

There is no public market for the Series C Preferred Stock being offered by us in this offering.

Prior to this offering, there has been no public market for our Series C Preferred Stock. We are not listing our Series C Preferred Stock on an exchange or any trading system, including the Nasdaq Capital Market, and we do not expect that a trading market for our Series C Preferred Stock will develop.

Upon conversion of the Series C Preferred Stock, holders may receive less valuable consideration than expected because the value of our common stock may decline after such holders exercise their conversion right but before we settle our conversion obligation.

Under the Series C Preferred Stock, a converting holder will be exposed to fluctuations in the value of our common stock during the period from the date such holder surrenders shares of Series C Preferred Stock for conversion until the date we settle our conversion obligation. Upon conversion, we will be required to deliver the shares of our common stock, together with a cash payment for any fractional share (if so elected by the Company), on the third business day following the relevant conversion date. Accordingly, if the price of our common stock decreases during this period, the value of the shares of common stock that you receive will be adversely affected and would be less than the conversion value of the Series C Preferred Stock on the conversion date.

We may issue additional series of preferred stock that rank senior or equally to the Series C Preferred Stock as to dividend payments and liquidation preference.

Neither our amended and restated certificate of incorporation nor the Certificate of Designation for the Series C Preferred Stock prohibits us from issuing additional series of preferred stock that would rank senior or equally to the Series C Preferred Stock as to dividend payments and liquidation preference. Our amended and restated certificate of incorporation provides that we have the authority to issue up to 2,000,000 shares of preferred stock. The issuances of other series of preferred stock could have the effect of reducing the amounts available to the Series C Preferred Stock in the event of our liquidation, winding-up or dissolution. It may also reduce cash dividend payments on the Series C Preferred Stock if we do not have sufficient funds to pay dividends on all Series C Preferred Stock outstanding and outstanding parity preferred stock.

Our Series C Preferred Stock will rank junior to all our liabilities to third party creditors in the event of a bankruptcy, liquidation or winding up of our assets.

In the event of bankruptcy, liquidation or winding up, our assets will be available to pay obligations on our Series C Preferred Stock only after all our liabilities have been paid. Our Series C Preferred Stock will effectively rank junior

to all existing and future liabilities held by third party creditors. The terms of our Series C Preferred Stock do not restrict our ability to raise additional capital in the future through the issuance of debt. In the event of bankruptcy, liquidation or winding up, there may not be sufficient assets remaining, after paying our liabilities, to pay amounts due on any or all of our Series C Preferred Stock then outstanding.

Future issuances of preferred stock may adversely affect the market price for our common stock.

Additional issuances and sales of preferred stock, or the perception that such issuances and sales could occur, may cause prevailing market prices for our common stock to decline and may adversely affect our ability to raise additional capital in the financial markets at times and prices favorable to us.

We have received notices from NASDAQ of non-compliance with its continuing listing rules.

On July 16, 2015, we received a notice from NASDAQ of non-compliance with its continuing listing rules, namely that the audit committee of our Board of Directors had two members following James McGorry's appointment as our President and Chief Executive Officer instead of the required minimum of three members. In accordance with NASDAQ continued listing rules, we were given until the earlier of our next annual shareholders' meeting or July 6, 2016 to add a third audit committee member. On March 10, 2016, Blaine McKee, Ph.D. was appointed as a member of the Board of Directors and its audit committee, and we regained compliance with that requirement.

On November 10, 2015, we received a notice from NASDAQ of non-compliance with its listing rules regarding the requirement that the listed securities maintain a minimum bid price of \$1 per share. Based upon the closing bid price for the 30 consecutive business days preceding the notice, the Company no longer met this requirement. However, the NASDAQ rules also provide the Company a period of 180 calendar days in which to regain compliance and, in some circumstances, a second 180-day compliance period. On November 25, 2015, we regained compliance with the minimum bid price requirement when the closing price of our common stock was at least \$1 per share for ten consecutive business days.

On November 18, 2016, we received a notice from NASDAQ of non-compliance with its listing rules regarding the minimum bid price requirement. As noted above, the NASDAQ rules provide the Company a period of 180 calendar days in which to regain compliance and, in some circumstances, a second 180-day compliance period. We are monitoring the closing bid price of our common stock and will consider available options to resolve the non-compliance with the minimum bid price requirement as may be necessary, including the possibility of seeking stockholder approval of a reverse stock split. There can be no assurance that we would be successful in receiving such stockholder approval.

The failure to meet continuing compliance standards subjects our common stock to delisting. Delisting of our common stock would have an adverse effect on the market liquidity of our common stock and, as a result, the market price for our common stock could become more volatile. Further, delisting also could make it more difficult for us to raise additional capital.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus (including any related prospectus supplement or free writing prospectus and documents incorporated by reference herein and therein) contains statements with respect to us which constitute “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended, and are intended to be covered by the “safe harbor” created by those sections. These statements relate to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements may include, but are not limited to, statements relating to the regulatory approval of our Cellspan™ product candidates for the esophagus and airways or any other product candidates, by the FDA, EMA, MHRA or otherwise, which such approvals may not be obtained on a timely basis or at all; anticipated future earnings or other financial measures; success with respect to any clinical trials and other regulatory approval efforts and the number of patients who can be treated with our products or product candidates; commercialization efforts and marketing approvals of our products as well as the success thereof, including our Cellspan product candidates for the esophagus and airways; the continued availability of a market for our securities; our ability to raise sufficient capital to finance our planned operations, and our estimates concerning capital requirements and need for additional financing; our ability to continue as a going concern; the amount and timing of costs associated with our development of bioreactors, scaffolds and other devices and products; our failure to comply with regulations and any changes in regulations; our ability to access debt and equity markets; unpredictable difficulties or delays in the development of new technology; our collaborators not devoting sufficient time and resources to successfully carry out their duties or meet expected deadlines; our ability to attract and retain qualified personnel and key employees and retain senior management; the availability and price of acceptable raw materials and components from third-party suppliers; difficulties in obtaining or retaining the management and other human resource competencies that we need to achieve our business objectives; increased competition in the field of regenerative medicine and the financial resources of our competitors; our ability to obtain and maintain intellectual property protection for our device and product candidates; our inability to implement our growth strategy; and our liquidity.

In some cases, you can identify forward-looking statements by terms such as “believe,” “may,” “estimate,” “continue,” “anticipate,” “intend,” “should,” “could,” “would,” “target,” “seek,” “aim,” “believe,” “predicts,” “think,” “objectives,” “optimistic,” “strategy,” “potential,” “is likely,” “will,” “expect,” “plan” “project,” “permit” and similar expressions intended to identify forward-looking statements. These statements reflect our current views with respect to future events, are based on assumptions and are subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading “Risk Factors” in our SEC filings, and under the caption “Risk Factors” in this prospectus.

You should read this prospectus and any related prospectus supplement and free writing prospectus and the documents that we incorporate by reference herein and therein and have filed as exhibits to the registration statement, of which this prospectus is part, completely and with the understanding that our actual future

results may be materially different from what we expect. You should assume that the information appearing in this prospectus is accurate as of the date on the cover of this prospectus or prospectus supplement only. Our business, financial condition, results of operations and prospects may change. We may not update these forward-looking statements, even though our situation may change in the future, unless we have obligations under the federal securities laws to update and disclose material developments related to previously disclosed information. We qualify all of the information presented in this prospectus and any related prospectus supplement or free writing prospectus, and particularly our forward-looking statements, by these cautionary statements.

USE OF PROCEEDS

We estimate the net proceeds from this offering will be approximately \$ million, after deducting placement agent fees and expenses and our estimated offering expenses. In addition, if all of the warrants offered pursuant to this prospectus are exercised in full for cash, we will receive approximately an additional \$ million in cash.

We intend to use the net proceeds from this offering, together with other available funds, for research and development, including funding preclinical and clinical trials relating to the Cellframe™ technology, business development, sales and marketing, capital expenditures, working capital and other general corporate purposes.

Pending these uses, we intend to invest the net proceeds to us from this offering in a variety of capital preservation investments, including short-term, investment-grade and interest-bearing instruments. The precise amounts and timing of the application of proceeds will depend upon our funding requirements and the availability of other funds. We may find it necessary or advisable to use the net proceeds for other purposes, and we will have broad discretion in the application of the net proceeds and investors will be relying on the judgment of our management regarding the application of the net proceeds from this offering.

Based upon our historical and anticipated future growth and our financial needs, we may engage in additional financings of a character and amount that we determine as the need arises. We may raise additional capital through additional public or private financings, the incurrence of debt and other available sources.

PRICE RANGE OF OUR COMMON EQUITY

Our common stock trades on The NASDAQ Capital Market under the symbol “BSTG.” Prior to April 1, 2016, in connection with our name change, our common stock traded on The NASDAQ Capital Market under the symbol “HART” since October 21, 2013. The following table sets forth, for the quarters shown, the range of high and low sales prices of our common stock on the NASDAQ Capital Market.

	High	Low
Fiscal Year ended December 31, 2016		
First Quarter	\$2.60	\$1.08
Second Quarter	\$2.86	\$0.92
Third Quarter	\$1.22	\$0.90
Fourth Quarter	\$1.42	\$0.73
Fiscal Year ended December 31, 2015		
First Quarter	\$4.32	\$1.89
Second Quarter	\$3.47	\$1.39
Third Quarter	\$1.49	\$0.59
Fourth Quarter	\$3.25	\$0.54

The closing price of our common stock on the NASDAQ Capital Market on December 30, 2016 was \$0.89 per share. Immediately prior to this offering, we had 17,108,968 shares of common stock outstanding, which were held by approximately 178 stockholders of record as of December 30, 2016.

DIVIDEND POLICY

We have never declared or paid cash dividends on our common stock in the past and do not intend to pay cash dividends on our common stock in the foreseeable future. Any future determination to pay cash dividends will be at the discretion of our board of directors and will depend on our financial condition, results of operations, capital requirements and other factors our board of directors deems relevant.

DILUTION

If you purchase our common stock, Series C Preferred Stock, or both, in this offering, assuming conversion of the Series C Preferred Stock into shares of our common stock, your interest will be diluted to the extent of the difference between the public offering price per share and the net tangible book value per share of our common stock after this offering.

The net tangible book value of our common stock on September 30, 2016 was approximately \$4.8 million, or approximately \$0.28 per share, based on 17,108,968 shares of our common stock outstanding as of September 30, 2016. We calculate net tangible book value per share by subtracting our total liabilities from our total tangible assets and dividing the difference by the number of outstanding shares of our common stock. Dilution in net tangible book value per share to the new investors represents the difference between the amount per share paid by purchasers of shares of our common stock in this offering and the net tangible book value per share of our common stock immediately afterwards.

After giving effect to the sale of shares of common stock by us at the public offering price and shares of Series C Preferred Stock by us at the public offering price (including the shares of common stock issuable upon conversion of the Series C Preferred Stock) and after deducting placement agent fees and expenses and estimated offering expenses, our pro forma net tangible book value as of September 30, 2016 would have been approximately \$ million, or \$ per share, which excludes the warrants to purchase shares of our common stock to be issued to investors in this offering. This represents an immediate increase in net tangible book value of \$ per share to existing stockholders and immediate dilution of \$ per share to investors purchasing our common stock in this offering at the public offering price. The following table illustrates this dilution on a per share basis:

Public offering price per share of common stock	
Public offering price per share of Series C Preferred Stock (on an as-converted basis)	
Net tangible book value per share as of September 30, 2016	\$0.28
Increase in net tangible book value per share attributable to this offering	
Pro forma net tangible book value per share as of September 30, 2016 after giving effect to this offering	
Dilution per share to the new investors in this offering	

The number of shares of our common stock to be outstanding after this offering is based on 17,108,968 shares of our common stock outstanding as of September 30, 2016 and assumes the conversion of all shares of Series C Preferred Stock being offered in this offering into an aggregate of shares of common stock, but does not include, as of such date:

· 3,879,033 shares issuable upon exercise of outstanding stock options;

· 268 shares issuable pursuant to outstanding deferred stock awards of restricted stock units;

· 1,560,284 shares issuable upon exercise of outstanding warrants to purchase shares of our common stock;

· 2,035,775 shares available for future grants under our 2013 Equity Incentive Plan and our Employee Stock Purchase Plan;

· _____ shares of common stock issuable upon the exercise of warrants to be issued to investors in this offering at an exercise price of \$ _____ per share; and

· _____ shares of common stock issuable upon exercise of warrants to be issued to the placement agent as described in "Plan of Distribution."

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To the extent that outstanding options or warrants are exercised, investors purchasing our common stock in this offering will experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

DESCRIPTION OF OUR CAPITAL STOCK

The following description of our common stock, warrants to purchase our common stock and Series C Convertible Preferred Stock summarizes the material terms and provisions of the securities that we may offer under this prospectus. The following description of our capital stock does not purport to be complete and is subject to, and qualified in its entirety by, our amended and restated certificate of incorporation, or our Charter, and our second amended and restated bylaws, or our Bylaws, which are exhibits to the registration statement of which this prospectus forms a part, and by applicable law. The terms of our common stock and warrants to purchase our common stock may also be affected by Delaware law.

Authorized Capital Stock

Our authorized capital stock consists of 60,000,000 shares of common stock, par value \$0.01 per share, and 2,000,000 shares of undesignated preferred stock, par value \$0.01 per share. As of December 30, 2016, there were 17,108,968 shares of common stock outstanding and no shares of preferred stock outstanding.

Common Stock

Holders of our common stock are entitled to one vote for each share held of record on all matters submitted to a vote of shareholders; provided, that, except as otherwise required by law, holders of common stock are not entitled to vote on any amendment to the Charter that changes the powers, preferences, rights or other terms of one or more series of undesignated preferred stock if the holders of the affected series are entitled to vote, separately or together, with the holders of one or more other such series, on such amendment pursuant to our Charter or Delaware General Corporation Law. Our Charter provides that our Board of Directors shall be divided into three classes, each consisting as nearly as reasonably may be possible of one-third of the total number of directors constituting the entire Board of Directors, with each class's term expiring on a staggered basis. Newly-created directorships and vacancies on our Board of Directors may only be filled by a majority of the members of the incumbent board then in office, though less than a quorum, and not by our stockholders. Directors may be removed from office only for cause by the affirmative vote of the holders of at least seventy-five percent (75%) of the outstanding shares entitled to be cast on the election of directors by the then-outstanding shares of all classes and series of capital stock, voting together as a single class. Holders of common stock have no preemptive, redemption or conversion rights and are not subject to future calls or assessments. No sinking fund provisions apply to our common stock. All outstanding shares are fully-paid and non-assessable. In the event of our liquidation, dissolution or winding up, after the satisfaction in full of the liquidation preferences of holders of any preferred stock, holders of common stock are entitled to ratable distribution of the remaining assets available for distribution to stockholders. Holders of common stock are entitled to receive proportionately any such dividends declared by our Board of Directors, out of legally available funds for dividends, subject to any preferences that may be applicable to any shares of preferred stock that may be outstanding at that time.

The rights, preferences and privileges of holders of common stock are subject to, and may be adversely affected by, the rights of the holders of shares of any series of preferred stock that we may designate and issue in the future. To the extent our Shareholder Rights Agreement remains in effect at the time we sell any shares of common stock under this prospectus, such shares of common stock would also be accompanied by certain preferred stock purchase rights. See “Description of Capital Stock – Provisions of our Certificate of Incorporation and Bylaws and Delaware Anti-Takeover Law” for additional details regarding our Shareholder Rights Agreement.

Listing

Our common stock is listed on the NASDAQ Capital Market under the symbol “BSTG.” On December 30, 2016, the closing price for our common stock, as reported on the NASDAQ Capital Market, was \$0.89 per share. As of the close of business on December 30, 2016, there were 178 stockholders of record of our common stock. Prior to our name change on March 31, 2016 from Harvard Apparatus Regenerative Technology, Inc. to Biostage, Inc., our common stock was listed on the NASDAQ Capital Market under the symbol “HART.”

On July 16, 2015, we received a notice from NASDAQ of non-compliance with its continuing listing rules, namely that the audit committee of our Board of Directors had two members following James McGorry’s appointment as our President and Chief Executive Officer instead of the required minimum of three members. In accordance with

NASDAQ continued listing rules, we were given until the earlier of our next annual shareholders' meeting or July 6, 2016 to add a third audit committee member. On March 10, 2016, Blaine McKee, Ph.D. was appointed as a member of the Board of Directors and its audit committee, and we regained compliance with that requirement.

On November 10, 2015, we received a notice from NASDAQ of non-compliance with its listing rules regarding the requirement that the listed securities maintain a minimum bid price of \$1 per share. Based upon the closing bid price for the 30 consecutive business days preceding the notice, the Company no longer met this requirement. However, the NASDAQ rules also provide the Company a period of 180 calendar days in which to regain compliance and, in some circumstances, a second 180-day compliance period. On November 25, 2015, we regained compliance with the minimum bid price requirement when the closing price of our common stock was at least \$1 per share for ten consecutive business days.

On November 18, 2016, we received a notice from NASDAQ of non-compliance with its listing rules regarding the minimum bid price requirement. As noted above, the NASDAQ rules provide the Company a period of 180 calendar days in which to regain compliance and, in some circumstances, a second 180-day compliance period. We are monitoring the closing bid price of our common stock and will consider available options to resolve the noncompliance with the minimum bid price requirement as may be necessary, including the possibility of seeking stockholder approval of a reverse stock split. There can be no assurance that we would be successful in receiving such stockholder approval.

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare.

Series C Convertible Preferred Stock

General

Our Board of Directors is authorized to issue up to 2,000,000 shares of preferred stock in one or more series without shareholder approval. Our Board of Directors may determine the designations, powers, preferences and the relative, participating, optional or other special rights, and any qualification, limitations and restrictions, of each series of preferred stock. Our Board of Directors has designated 5,000 shares of preferred stock as Series A Junior Participating Cumulative Preferred Stock, 1,000,000 shares of preferred stock as Series B Convertible Preferred Stock and

shares of preferred stock as Series C Convertible Preferred Stock, which we refer to herein as the Series C Preferred Stock. The Series A Junior Participating Cumulative Preferred Stock and Series B Convertible Preferred Stock is not being registered pursuant to the registration statement of which this prospectus forms a part. As of December 30, 2016, there were no shares of preferred stock outstanding.

Rank

The Series C Preferred Stock ranks (1) on parity with our common stock on an “as converted” basis, (2) on parity with our Series A Junior Participating Cumulative Preferred Stock and Series B Convertible Preferred Stock, (3) senior to any series of our capital stock hereafter created specifically ranking by its terms junior to the Series C Preferred Stock, (4) on parity with any series of our capital stock hereafter created specifically ranking by its terms on parity with the Series C Preferred Stock, and (5) junior to any series of our capital stock hereafter created specifically ranking by its terms senior to the Series C Preferred Stock in each case, as to dividends or distributions of assets upon our liquidation, dissolution or winding up whether voluntary or involuntary.

Conversion

Each share of the Series C Preferred Stock is convertible into shares of common stock at any time at the option of the holder, provided that the holder will be prohibited from converting Series C Preferred Stock into shares of our common stock if, as a result of such conversion, the holder would own more than 4.99% of the number of shares of common stock outstanding immediately after giving effect to the issuance of the shares of common stock issuable upon conversion of the Series C Preferred Stock, or such holder, together with its affiliates, would own

more than 9.99% of the number of shares of common stock outstanding immediately after giving effect to the issuance of the shares of common stock issuable upon conversion of the Series C Preferred Stock. The conversion rate of the Series C Preferred Stock is subject to proportionate adjustments for stock splits, reverse stock splits and similar events, but is not subject to adjustment based on price anti-dilution provisions. The Series C Preferred Stock automatically converts into common stock upon the occurrence of certain “Fundamental Transactions,” as described below.

Dividends

In addition to stock dividends or distributions for which proportionate adjustments will be made, holders of Series C Preferred Stock are entitled to receive dividends on shares of Series C Preferred Stock equal, on an as-if-converted-to-common-stock basis, to and in the same form as dividends actually paid on shares of the common stock when, as and if such dividends are paid on shares of the common stock. No other dividends are payable on shares of Series C Preferred Stock.

Voting Rights

Except as provided in the Certificate of Designation or as otherwise required by law, the holders of Series C Preferred Stock will have no voting rights. However, the Company may not, without the consent of holders of a majority of the outstanding shares of Series C Preferred Stock, alter or change adversely the powers, preferences or rights given to the Series C Preferred Stock or alter or amend the Certificate of Designation.

Liquidation Rights

Upon any liquidation, dissolution or winding-up of the Company, whether voluntary or involuntary, the holders of Series C Preferred Stock are entitled to receive, *pari passu* with the holders of common stock, out of the assets available for distribution to stockholders an amount equal to such amount per share as would have been payable had all shares of Series C Preferred Stock been converted into common stock immediately before such liquidation, dissolution or winding up, without giving effect to any limitation on conversion as a result of the Beneficial Ownership Limitation, as described below.

Beneficial Ownership Limitation

The Company may not effect any conversion of the Series C Preferred Stock, and a holder does not have the right to convert any portion of the Series C Preferred Stock to the extent that, after giving effect to the conversion set forth in a notice of conversion such holder would beneficially own in excess of the holder Beneficial Ownership Limitation, or such holder, together with such holder's affiliates, and any persons acting as a group together with such holder or affiliates, would beneficially own in excess of the affiliates Beneficial Ownership Limitation. The "holder Beneficial Ownership Limitation" is 4.99% of the number of shares of the common stock outstanding immediately after giving effect to the issuance of shares of common stock issuable upon conversion of Series C Preferred Stock held by the applicable holder. The "affiliates Beneficial Ownership Limitation" is 9.99% of the number of shares of the common stock outstanding immediately after giving effect to the issuance of shares of common stock issuable upon conversion of Series C Preferred Stock held by the applicable holder and its affiliates (the holder Beneficial Ownership Limitation together with the affiliates Beneficial Ownership Limitation collectively referred to as the "Beneficial Ownership Limitation"). A holder may, with 61 days prior notice to the Company, or immediately upon notice from the holder to the Company at any time after the public announcement or other disclosure of a Fundamental Transaction, elect to increase or decrease one or both of the holder Beneficial Ownership Limitation and the affiliates Beneficial Ownership Limitation; provided, however, that in no event may either the holder Beneficial Ownership Limitation or the affiliate Beneficial Ownership Limitation be 9.99% or greater.

Exchange Listing

We do not plan on making an application to list the shares of Series C Preferred Stock on the NASDAQ Capital Market, any national securities exchange or other nationally recognized trading system. Our common stock issuable upon conversion of the Series C Preferred Stock is listed on the NASDAQ Capital Market.

Failure to Deliver Conversion Shares

If the Company fails to timely deliver shares of common stock upon conversion of the Series C Preferred Stock (the “Conversion Shares”) within the time period specified in the Certificate of Designation (within three trading days after delivery of the notice of conversion), and if the holder has not exercised its Buy-In rights as described below with respect to such shares, then the Company is obligated to pay to the holder, as liquidated damages, an amount equal to \$100 per business day (increasing to \$200 per business day after the tenth business day) for each \$10,000 of Conversion Shares for which the Series C Preferred Stock converted which are not timely delivered. If the Company makes such liquidated damages payments, it is not also obligated to make Buy-In payments with respect to the same Conversion Shares.

Compensation for Buy-In on Failure to Timely Deliver Shares

If the Company fails to timely deliver the Conversion Shares to the holder, and if after the required delivery date the holder is required by its broker to purchase (in an open market transaction or otherwise) or the holder or its brokerage firm otherwise purchases, shares of common stock to deliver in satisfaction of a sale by the holder of the Conversion Shares which the holder anticipated receiving upon such conversion or exercise (a “Buy-In”), then the Company is obligated to (A) pay in cash to the holder the amount, if any, by which (x) the holder’s total purchase price (including brokerage commissions, if any) for the shares of common stock so purchased, minus any amounts paid to the holder by the Company as liquidated damages for late delivery of such shares, exceeds (y) the amount obtained by multiplying (1) the number of Conversion Shares that the Company was required to deliver times (2) the price at which the sell order giving rise to such purchase obligation was executed, and (B) at the option of the holder, either reinstate the portion of the Series C Preferred Stock and equivalent number of Conversion Shares for which such conversion was not honored (in which case such conversion shall be deemed rescinded) or deliver to the holder the number of shares of common stock that would have been issued had the Company timely complied with its conversion and delivery obligations.

Subsequent Rights Offerings; Pro Rata Distributions

If the Company grants, issues or sells any common stock equivalents pro rata to the record holders of any class of shares of common stock (the "Purchase Rights"), then a holder of Series C Preferred Stock will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the holder could have acquired if the holder had held the number of shares of common stock acquirable upon conversion of the Series C Preferred Stock (without regard to any limitations on conversion). If the Company declares or makes any dividend or other distribution of its assets (or rights to acquire its assets) to holders of common stock, then a holder of Series C Preferred Stock is entitled to participate in such distribution to the same extent as if the holder had held the number of shares of common stock acquirable upon complete conversion of the Series C Preferred Stock (without regard to any limitations on conversion).

Fundamental Transaction

If, at any time while the Series C Preferred Stock is outstanding, (i) the Company, directly or indirectly, in one or more related transactions effects any merger or consolidation of the Company with or into another person pursuant to which the shares of capital stock of the Company outstanding immediately prior to such merger or consolidation are converted into or exchanged for shares of another corporation or entity and represent, or are converted into or exchanged for equity securities that represent, immediately following such merger or consolidation, less than a majority, by voting power, of the equity securities of (1) the surviving or resulting party or (2) if the surviving or resulting party is a wholly owned subsidiary of another party immediately following such merger or consolidation,

the parent of such surviving or resulting party, (ii) the Company, directly or indirectly, effects any sale of all or substantially all of its assets in one or a series of related transactions, (iii) any tender offer or exchange offer (whether by the Company or another person) is completed pursuant to which holders of common stock are permitted to sell, tender or exchange their shares for other securities, cash or property and has been accepted by the holders of 50% or more of the outstanding common stock, or (iv) the Company, directly or indirectly, in one or more related transactions consummates a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with another person whereby such other person acquires more than 50% of the outstanding shares of common stock (not including any shares of common stock held by the other person or other persons making or party to, or associated or affiliated with the other persons making or party to, such stock or share purchase agreement or other business combination) (each a “Fundamental Transaction”), then the Series C Preferred Stock automatically converts and the holder will receive, for each Conversion Share that would have been issuable upon such conversion immediately prior to the occurrence of such Fundamental Transaction (subject to the Beneficial Ownership Limitation), the number of shares of common stock of the successor or acquiring corporation or of the Company, if it is the surviving corporation, and any additional consideration (the “Alternate Consideration”) receivable as a result of such Fundamental Transaction by a holder of the number of shares of common stock for which the Series C Preferred Stock is convertible immediately prior to such Fundamental Transaction (subject to the Beneficial Ownership Limitation). For purposes of any such conversion, the determination of the conversion ratio will be appropriately adjusted to apply to such Alternate Consideration based on the amount of Alternate Consideration issuable in respect of one share of common stock in such Fundamental Transaction. If holders of common stock are given any choice as to the securities, cash or property to be received in a Fundamental Transaction, then the holder will be given the same choice as to the Alternate Consideration it receives upon automatic conversion of the Series C Preferred Stock following such Fundamental Transaction.

Warrants

The following is a brief summary of the material terms of the warrants offered pursuant to this prospectus and is subject in all respects to the provisions contained in the warrants, the form of which is incorporated by reference in this prospectus. As of December 30, 2016, there were warrants to purchase 1,560,284 shares of our common stock outstanding. The previously issued warrants all have an exercise price of \$1.7625 per warrant and are exercisable commencing November 19, 2016 through their expiration date of May 19, 2021.

Exercisability

Holders may exercise warrants at any time up to 11:59 p.m., New York time, on the date that is _____ years after the date of issuance. The warrants are exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of our common stock purchased upon such exercise (except in the case of a cashless exercise discussed below). The holder of warrants does not have the right to exercise any portion of the warrant if the holder would beneficially own in excess of 4.99% of the shares of our common stock outstanding immediately after giving effect to such exercise. This percentage may,

however, be raised or lowered to an amount not to exceed 9.99% at the option of the holder upon at least 61 days' prior notice from the holder to us.

Cashless Exercise

At any time when a registration statement covering the issuance of the shares of common stock issuable upon exercise of the warrants is not effective, the holder may, at its option, exercise its warrants on a cashless basis. When exercised on a cashless basis, a portion of the warrant is cancelled in payment of the purchase price payable in respect of the number of shares of our common stock purchasable upon such exercise.

Exercise Price

The exercise price of common stock purchasable upon exercise of the warrants is \$ _____ per share. The exercise price and the number of shares issuable upon exercise of the warrants is subject to appropriate adjustment in the event of recapitalization events, stock dividends, stock splits, stock combinations, reclassifications or similar events affecting our common stock, and also upon any distributions of assets, including cash, stock or other property to our stockholders.

Transferability

The warrants may be transferred at the option of the holder upon surrender of the warrants with the appropriate instruments of transfer.

Exchange Listing

We do not plan on making an application to list the warrants on the NASDAQ Capital Market, any national securities exchange or other nationally recognized trading system. Our common stock underlying the warrants is listed on the NASDAQ Capital Market.

Fundamental Transactions

In the event of a fundamental transaction, as described in the warrants and generally including any reorganization, recapitalization or reclassification of our common stock, the sale, transfer or other disposition of all or substantially all of our properties or assets, our consolidation or merger with or into another person, the holders of the warrants will be entitled to receive upon exercise of the warrants the kind and amount of securities with cash or other property that the holders would have received had they exercised the warrants immediately prior to such fundamental transaction.

Rights as Stockholder

Except as otherwise provided in the warrants (such as the rights described above of a warrant holder upon our sale or grant of any rights to purchase stock, warrants or securities or other property to our stockholders on a pro rata basis) or by virtue of such holder's ownership of shares of our common stock, the holders of the warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their warrants.

Fractional Shares

No fractional shares of common stock will be issued upon the exercise of the warrants. Rather, the number of shares of common stock to be issued will be rounded down to the nearest whole number.

2013 Equity Incentive Plan

Under our 2013 Equity Incentive Plan, we can grant stock options to employees, directors and consultants. The 2013 Equity Incentive Plan also permits us to make grants of incentive stock options, non-qualified stock options, stock appreciation rights, deferred stock awards, restricted stock awards, unrestricted stock awards, performance shares and dividend equivalent rights. We currently have reserved 5,960,000 shares of common stock for the issuance of awards under the 2013 Equity Incentive Plan.

Employee Stock Purchase Plan

Under our employee stock purchase plan, participating employees can authorize us to withhold a portion of their base pay during consecutive six-month payment periods for the purchase of shares of our common stock. At the conclusion of the period, participating employees can purchase shares of our common stock at eight-five percent (85%) of the lower of the fair market value of our common stock at the beginning or end of the period. Shares are

issued under the plan for the six-month periods ending June 30 and December 31. Under this plan, 150,000 shares of common stock are authorized for issuance of which 58,638 were issued as of December 30, 2016.

Provisions of our Certificate of Incorporation and Bylaws and Delaware Anti-Takeover Law

Certain provisions of the Delaware General Corporation Law and of our Charter and Bylaws could have the effect of delaying, deferring or discouraging another party from acquiring control of us. These provisions, which are summarized below, are expected to discourage certain types of coercive takeover practices and inadequate takeover bids and, as a consequence, they might also inhibit temporary fluctuations in the market price of our common stock that often result from actual or rumored hostile takeover attempts. These provisions are also designed in part to encourage anyone seeking to acquire control of us to first negotiate with our Board of Directors. These provisions might also have the effect of preventing changes in our management. It is possible that these provisions could make it more difficult to accomplish transactions that stockholders might otherwise deem to be in their best interests. However, we believe that the advantages gained by protecting our ability to negotiate with any unsolicited and potentially unfriendly acquirer outweigh the disadvantages of discouraging such proposals, including those priced above the then-current market value of our common stock, because, among other reasons, the negotiation of such proposals could improve their terms.

Provisions of our Certificate of Incorporation and Bylaws

Our Charter, our Bylaws and Delaware law contain provisions that could discourage, delay or prevent a third party from acquiring us, even if doing so may be beneficial to our stockholders. In addition, these provisions could limit the price investors would be willing to pay in the future for shares of our common stock. The following are examples of such provisions in our Charter and Bylaws:

• only our Board of Directors, pursuant to a resolution adopted by a majority of our directors, may call special meetings of our stockholders;

• stockholders may not act by written consent and stockholder action must take place at the annual or special meeting of our stockholders;

• stockholder proposals and nominations of candidates for election as directors other than nominations made by or at the direction of our Board of Directors or a committee of our Board of Directors to be brought before any meeting of our stockholders must comply with advance notice procedures;

our Board of Directors is classified into three classes, each consisting as nearly as reasonably may be possible of one-third of the total number of directors constituting the entire Board of Directors;

our Board will fix the exact number of directors to comprise our Board of Directors;

subject to any rights that holders of any series of our undesignated preferred stock may have to elect directors and to fill vacancies on our Board of Directors, newly-created directorships and vacancies on our Board of Directors may only be filled by a majority of the members of the incumbent board then in office, even if less than a quorum is present, and not by our stockholders;

a director may be removed from office only for cause by the affirmative vote of holders of shares representing at least seventy-five percent (75%) of the votes entitled to be cast on such matter by the then-outstanding shares of all classes and series of our capital stock, voting together as a single class;

our Charter and Bylaws do not provide for cumulative voting in the election of directors;

our Bylaws may be further amended by either (i) the affirmative vote of at least a majority of our entire Board of Directors or (ii) the affirmative vote of the holders of at least seventy-five percent (75%) of the combined voting power of the outstanding shares of all classes and series of our capital stock entitled to vote on such amendment, voting together as a single class; and

our Board of Directors is authorized to issue, without further action by our stockholders, up to 2,000,000 shares of undesignated preferred stock with rights and preferences, including voting rights, designated from time to time by our Board of Directors.

We implemented a Stockholder Rights Plan (the “Rights Plan”) on October 31, 2013. Pursuant to the Rights Plan, one preferred stock purchase right will be issued for each outstanding share of our common stock. Each right issued will be subject to the terms of the Rights Plan. The Rights Plan is intended to protect our stockholders in the event of an unfair or coercive offer to acquire us and to provide the Board of Directors with adequate time to evaluate unsolicited offers; however, it may have anti-takeover effects. In general terms, our Rights Plan works by imposing a significant penalty upon any person or group that acquires twenty percent (20%) or more of our outstanding common stock, without the approval of our Board of Directors. The Rights Plan, however, should not affect any prospective offer or willingness to make an offer at a fair price as determined by our Board of Directors, nor should it interfere with any merger or other business combination approved by our Board of Directors. However, because the rights may substantially dilute the stock ownership of a person or group attempting to take us over without the approval of our Board of Directors, our Rights Plan could make it more difficult for a third party to acquire us (or a significant percentage of our outstanding capital stock) without first negotiating with our Board of Directors regarding that acquisition.

Additionally, as required by the Delaware General Corporation Law, any amendment of our Charter must first be approved by a majority of our Board of Directors and, as required by our Charter, thereafter be approved by a majority of the outstanding shares entitled to vote on the amendment, and a majority of the outstanding shares of each class entitled to vote thereon, voting together as a single class, except that the amendment of the provisions relating to stockholder action, directors, limitation of liability, the amendment of our Bylaws and Charter, forum and transactions with Harvard Bioscience must be approved by not less than seventy-five percent (75%) of the outstanding shares entitled to vote on the amendment, and not less than seventy-five percent (75%) of the outstanding shares of each class entitled to vote thereon as a class. Our Bylaws may be amended by either (i) a vote of at least a majority of our entire Board of Directors or (ii) a vote of the holders of at least seventy-five percent (75%) of the combined voting power of the outstanding shares of all classes and series of our capital stock entitled to vote on such amendment, voting together as a single class.

Delaware Anti-Takeover Law

We are subject to the provisions of Section 203 of the Delaware General Corporation Law. In general, Section 203 prohibits a publicly-held Delaware corporation from engaging in a “business combination” with an “interested stockholder” for a three-year period following the time that this stockholder becomes an interested stockholder, unless the business combination is approved in a prescribed manner. A “business combination” includes, among other things, a merger, asset or stock sale or other transaction resulting in a financial benefit to the interested stockholder. An “interested stockholder” is a person who, together with affiliates and associates, owns, or did own within three years prior to the determination of interested stockholder status, fifteen percent (15%) or more of the corporation’s voting stock. Under Section 203, a business combination between a corporation and an interested stockholder is prohibited

unless it satisfies one of the following conditions:

• before the stockholder became interested, the Board of Directors approved either the business combination or the transaction which resulted in the stockholder becoming an interested stockholder;

• upon consummation of the transaction which resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least eight-five percent (85%) of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the voting stock outstanding, shares owned by persons who are directors and also officers, and employee stock plans, in some instances; or

• at or after the time the stockholder became interested, the business combination was approved by the Board of Directors of the corporation and authorized at an annual or special meeting of the stockholders by the affirmative vote of at least two-thirds of the outstanding voting stock which is not owned by the interested stockholder.

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PLAN OF DISTRIBUTION

Pursuant to a placement agency agreement, we have engaged H.C. Wainwright & Co., LLC, or the placement agent, to act as our exclusive placement agent in connection with this offering of our securities pursuant to this prospectus on a reasonable best efforts basis. The terms of this offering were subject to market conditions and negotiations between us, the placement agent and prospective investors. The placement agency agreement does not give rise to any commitment by the placement agent to purchase any of our securities, and the placement agent will have no authority to bind us by virtue of the placement agency agreement. Further, the placement agent does not guarantee that it will be able to raise new capital in any prospective offering. The placement agent may engage sub-agents or selected dealers to assist with the offering.

Investors purchasing \$ _____ or more of the securities offered hereby will execute a securities purchase agreement with us, providing such investors with certain representations, warranties and covenants from us, which representations, warranties and covenants will not be available to investors of lesser amounts of our securities. Therefore, investors purchasing \$ _____ or less of the securities shall rely solely on this prospectus in connection with the purchase of securities in the offering.

We will deliver the securities being issued to the investors upon receipt of investor funds for the purchase of the securities offered pursuant to this prospectus. We expect to deliver the securities being offered pursuant to this prospectus on or about _____, 2017.

We have agreed to pay the placement agent a total cash fee equal to 7% of the gross proceeds of this offering, except with respect to cash consideration paid to us in this offering by certain investors, in which case we will pay the placement agent a cash fee equal to 4% of the gross proceeds received from such investors. We will also pay the placement agent a management fee equal to 1% of the gross proceeds of this offering, a reimbursement for out-of-pocket expenses in the amount of up to \$45,000 and a reimbursement for the placement agent's legal fees and expenses in the amount of \$100,000. In addition, we have agreed to issue to the placement agent warrants to purchase up to 5% of the aggregate number of shares of common stock sold in this offering at an exercise price of \$ _____ per share. The placement agent warrants will have substantially the same terms as the warrants being sold to the investors in this offering. Pursuant to FINRA Rule 5110(g), the placement agent warrants and any shares issued upon exercise of the placement agent warrants shall not be sold, transferred, assigned, pledged, or hypothecated, or be the subject of any hedging, short sale, derivative, put or call transaction that would result in the effective economic disposition of the securities by any person for a period of 180 days immediately following the date of effectiveness or commencement of sales of this offering, except the transfer of any security: (i) by operation of law or by reason of our reorganization; (ii) to any FINRA member firm participating in the offering and the officers or partners thereof, if all securities so transferred remain subject to the lock-up restriction set forth above for the remainder of the time period; (iii) if the aggregate amount of our securities held by the placement agent or related persons do not exceed 1% of the securities being offered; (iv) that is beneficially owned on a pro-rata basis by all equity owners of an investment fund, provided that no participating member manages or otherwise directs investments by the fund and the participating members in

the aggregate do not own more than 10% of the equity in the fund; or (v) the exercise or conversion of any security, if all securities remain subject to the lock-up restriction set forth above for the remainder of the time period.

We have also agreed to give the placement agent a twelve-month right of first refusal to act as our lead underwriter or placement agent for any further capital raising transactions undertaken by us (exclusive for the first six months and with a minimum of 50% of fees for the remaining six months) and, in the event an offering is not completed during the term of the agreement, a twelve-month tail fee equal to the cash and warrant compensation in this offering, if any investor who was contacted by the placement agent provides us with further capital during such twelve-month period following the expiration or termination of our engagement.

We have agreed to indemnify the placement agent and specified other persons against some civil liabilities, including liabilities under the Securities Act and the Exchange Act, and to contribute to payments that the placement agent may be required to make in respect of such liabilities.

The placement agent may be deemed to be an underwriter within the meaning of Section 2(a)(11) of the Securities Act, and any commissions received by it and any profit realized on the resale of the securities sold by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, the placement agent would be required to comply with the requirements of the Securities Act and the Exchange Act, including, without limitation, Rule 415(a)(4) under the Securities Act and Rule 10b-5 and Regulation M under the Exchange Act. These rules and regulations may limit the timing of purchases and sales of shares of common stock and warrants by the placement agent acting as principal. Under these rules and regulations, the placement agent:

· may not engage in any stabilization activity in connection with our securities; and

may not bid for or purchase any of our securities or attempt to induce any person to purchase any of our securities, other than as permitted under the Exchange Act, until it has completed its participation in the distribution.

Lock-up Agreements

Our officers and directors and their respective affiliates have agreed with the representative to be subject to a lock-up period of _____ days following the date of this prospectus. During the applicable lock-up period, such persons may not offer for sale, contract to sell, sell, distribute, grant any option, right or warrant to purchase, pledge, hypothecate or otherwise dispose of, directly or indirectly, any shares of our common stock or any securities convertible into, or exercisable or exchangeable for, shares of our common stock. Certain limited transfers are permitted during the lock-up period if the transferee agrees to these lock-up restrictions. The lock-up period is subject to an additional extension to accommodate for our reports of financial results or material news releases. The placement agent may, in its sole discretion and without notice, waive the terms of any of these lock-up agreements. In the securities purchase agreement, we have agreed to a limitation on the issuance and sale of our securities for _____ days following the closing of this offering, subject to certain exceptions.

Listing

Our common stock is listed on the NASDAQ Capital Market under the symbol “BSTG.”

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is Computershare.

Other Relationships

From time to time, the placement agent has provided, and may provide in the future, various advisory, investment and commercial banking and other services to us in the ordinary course of business, for which they have received and may continue to receive customary fees and commissions. However, except as disclosed in this prospectus, we have no present arrangements with the placement agent for any further services.

The placement agent in this offering served as our exclusive placement agent in a securities offering we consummated in May 2016, pursuant to which it received compensation, including warrants to purchase shares of our common stock.

EXECUTIVE COMPENSATION

We are an “emerging growth company” within the meaning of the Jumpstart Our Business Startups Act of 2012. As a result, we have elected to comply with the reduced disclosure requirements applicable to emerging growth companies in accordance with SEC rules. We have only three executive officers. James McGorry, our President and Chief Executive Officer, Thomas McNaughton, our Chief Financial Officer and Saverio LaFrancesca, M.D., our Chief Medical Officer, are named executive officers.

Summary Compensation Table

The table below summarizes the total compensation paid or earned by each of the named executive officers for services rendered in all capacities during the fiscal years ended December 31, 2015 and December 31, 2016, excluding the compensation Mr. McGorry received in 2015 as an independent director.

Name and Principal Position	Year	Salary	Option Awards ⁽¹⁾	All Other Compensation	Total
James McGorry	2016	\$375,000	\$168,720	\$19,208	⁽²⁾ \$562,928
President and Chief Executive Officer	2015	\$173,077	\$615,204	\$4,327	⁽³⁾ \$792,608
Thomas McNaughton	2016	\$309,000	\$84,360	\$15,483	⁽⁴⁾ \$408,843
Chief Financial Officer	2015	\$309,000	\$201,790	\$15,450	⁽⁵⁾ \$526,240
Saverio LaFrancesca, M.D.	2016	\$400,000	\$84,360	\$—	\$484,360
Chief Medical Officer	2015	\$400,000	\$489,292	\$—	\$889,292

Based on the aggregate grant date fair value computed in accordance with the provisions of FASB ASC 718, “Compensation — Stock Compensation”, excluding the impact of estimated forfeitures. Assumptions used in the calculation of this amount are set forth under 2013 Plan Valuation and Expense Information under

(1) Stock-Based-Payment Accounting in Note 13 to our audited financial statements for the fiscal year ended December 31, 2015, included in our Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 30, 2016.

(2) Amount represents \$17,307 for matching contributions made by the Company to Mr. McGorry’s tax-qualified 401(k) Savings Plan account and premiums in the amount of \$1,901 for a life insurance policy.

(3) Amount represents \$4,327 for matching contributions made by the Company to Mr. McGorry’s tax-qualified 401(k) Savings Plan account.

- (4) Amount represents \$15,483 for matching contributions made by the Company to Mr. McNaughton's tax-qualified 401(k) Savings Plan account.
- (5) Amount represents \$15,450 for matching contributions made by the Company to Mr. McNaughton's tax-qualified 401(k) Savings Plan account.

Discussion of Summary Compensation Table and Related Matters

*2016 Executive Compensation**Salary and Bonus*

In the first quarter of 2016, the Compensation Committee reviewed the overall executive compensation of the Company's named executive officers. Based on a variety of factors, with respect to the named executive officers, the Compensation Committee elected to not approve any salary increases or cash incentive compensation for 2016.

Long-Term Equity Incentive Compensation

In 2016, the Compensation Committee approved grants of long-term equity incentive awards in the form of stock options to executives as part of our total compensation package. The long-term equity incentive awards were granted in an effort to achieve certain key objectives, including (i) to attract and retain high performing and experienced executives, (ii) motivate and reward executives whose knowledge, skills and performance are critical to our success, and (iii) to align the interests of our executives and our stockholders by providing our executives with strong incentives to increase stockholder value and a significant reward for doing so. Our decisions regarding the amount and type of long-term equity incentive compensation and relative weighting of these awards among total executive compensation have also been based on our understanding of market practices of our peers and take into account additional factors such as level of individual responsibility, experience and performance. The long term incentive grants made to our named executive officers during fiscal 2016 are described in the table below:

	Stock Option Awards (#)
James McGorry <i>President and Chief Executive Officer</i>	150,000 ⁽¹⁾
Thomas McNaughton <i>Chief Financial Officer</i>	75,000 ⁽¹⁾
Saverio LaFrancesca, Ph.D. <i>Chief Medical Officer</i>	75,000 ⁽¹⁾

(1) These options vest in four equal installments on each of March 22, 2017, 2018, 2019 and 2020 and have a term of ten years from the date of grant, being March 22, 2016.

Employment Agreements and Severance and Change in Control Benefits

Current Named Executive Officers

James McGorry

We entered into an employment agreement with Mr. McGorry dated as of June 23, 2015 and effective as of July 6, 2015, appointing Mr. McGorry as our President and Chief Executive Officer. Mr. McGorry's employment agreement has a term of three years, but will automatically renew for successive one year periods unless either party provides 90 days' notice that it does not wish to extend the agreement. Mr. McGorry's employment agreement provides for an annual base salary in the amount of three hundred seventy-five thousand dollars (\$375,000) which will be reevaluated on an annual basis by the Board of Directors or the compensation committee. Mr. McGorry also received an option to purchase 671,400 shares of our common stock upon the commencement of his employment, which vests in four equal installments on January 1 of 2016, 2017, 2018 and 2019. Mr. McGorry is eligible to receive cash incentive compensation as determined by the Board of Directors or the compensation committee, and is also eligible to participate in all of our employee benefit plans, including without limitation, retirement plans, stock option plans, stock purchase plans and medical insurance plans.

Mr. McGorry's employment agreement also provides for payments to be made to Mr. McGorry in the event of his termination under certain circumstances. If Mr. McGorry's employment is terminated by us without "cause" (as such term is defined in Mr. McGorry's employment agreement) or by Mr. McGorry for "good reason" (as such term is defined in Mr. McGorry's employment agreement), we are obligated to pay Mr. McGorry the sum of his average annual base salary for the prior three fiscal years or annual salary for the prior fiscal year, whichever is higher, and his average annual cash incentive compensation for the prior three fiscal years or annual cash incentive compensation for the prior fiscal year, whichever is higher. Such payment is conditioned upon Mr. McGorry's

execution of a general release of claims against us. In addition, all of Mr. McGorry's stock options or stock-based awards that would otherwise vest within the 12 month period following such termination shall accelerate and become immediately exercisable. We shall continue to pay health insurance premiums for health insurance coverage for Mr. McGorry and his immediate family for a period of one year following his termination without cause or for good reason.

Mr. McGorry may also be entitled to certain payments in the event of a change in control of our Company. If Mr. McGorry's employment is terminated by us without cause or by Mr. McGorry for good reason within 18 months of a change in control of our Company, Mr. McGorry is entitled to receive a lump sum cash payment in an amount equal to the sum of Mr. McGorry's current or most recent annual salary and his most recent cash incentive compensation. In addition, in the event of a change in control, all of Mr. McGorry's stock options or stock-based awards shall accelerate and become immediately exercisable. We will continue to pay health insurance premiums for health insurance coverage for Mr. McGorry and his immediate family for a period of one year following his termination as a result of a change in control.

Mr. McGorry will not be entitled to severance payments unless mutually agreed upon in writing if Mr. McGorry is terminated for cause, due to death or disability, or he terminates his employment without good reason. In the event Mr. McGorry is terminated due to death or disability, we will continue to pay health insurance premiums for health insurance coverage for Mr. McGorry and his immediate family for a period of one year following his termination.

Pursuant to the terms of his employment agreement, Mr. McGorry is also subject to certain confidentiality, non-solicitation and non-competition obligations. The non-solicitation and non-competition obligations survive during the term of his agreement and for a period of 12 months thereafter.

For purposes of Mr. McGorry's employment agreement, "cause" means: (A) conduct by Mr. McGorry constituting a material act of willful misconduct in connection with the performance of his duties; (B) criminal or civil conviction of Mr. McGorry, a plea of nolo contendere by Mr. McGorry or conduct by Mr. McGorry that would reasonably be expected to result in material injury to our reputation if he were retained in his position with us; (C) continued, willful and deliberate non-performance by Mr. McGorry of his duties; (D) a breach by Mr. McGorry of his confidentiality, non-solicitation and non-competition obligations to us; or (E) a material violation by Mr. McGorry of our employment policies.

For purposes of Mr. McGorry's employment agreement, "good reason" means the occurrence of any of the following events: (A) a substantial diminution or other substantive adverse change, not consented to by Mr. McGorry, in his responsibilities, authorities, powers, functions or duties; (B) any removal of Mr. McGorry's title of President and/or Chief Executive Officer; (C) an involuntary reduction in Mr. McGorry's annual salary except for across-the-board reductions similarly affecting substantially all management employees; (D) a breach by us of any of our other material

obligations under Mr. McGorry's employment agreement; (E) the involuntary relocation of our offices at which Mr. McGorry is principally employed to a location more than 30 miles from our current offices; or (F) our failure to obtain the agreement from any successor company to us to assume and agree to perform Mr. McGorry's employment agreement.

Thomas McNaughton

On October 31, 2013, we entered into an Employment Agreement with Mr. McNaughton. The term of this agreement commenced on November 1, 2013. Mr. McNaughton's employment agreement has a term of two years, but will automatically renew for successive two year periods unless either party provides 90 days' notice that it does not wish to extend the agreement. Mr. McNaughton's employment agreement provides for an annual base salary in the amount of three hundred nine thousand dollars (\$309,000) which will be reevaluated on an annual basis by the Board of Directors or the compensation committee. Mr. McNaughton is eligible to receive cash incentive compensation as determined by the Board of Directors or the compensation committee, and is also eligible to participate in all of our employee benefit plans, including without limitation, retirement plans, stock option plans, stock purchase plans and medical insurance plans.

Mr. McNaughton's employment agreement also provides for payments to be made to Mr. McNaughton in the event of his termination under certain circumstances. If Mr. McNaughton's employment is terminated by us without "cause" (as such term is defined in Mr. McNaughton's employment agreement) or by Mr. McNaughton for "good reason" (as such term is defined in Mr. McNaughton's employment agreement), we are obligated to pay Mr. McNaughton the sum of his average annual base salary for the prior three fiscal years or annual salary for the prior fiscal year, whichever is higher, and his average annual cash incentive compensation for the prior three fiscal years or annual cash incentive compensation for the prior fiscal year, whichever is higher. Such payment is conditioned upon Mr. McNaughton's execution of a general release of claims against us. In addition, all of Mr. McNaughton's stock options or stock-based awards that would otherwise vest within the 18 month period following such termination shall accelerate and become immediately exercisable. We shall continue to pay health insurance premiums for health insurance coverage for Mr. McNaughton and his immediate family for a period of one year following his termination without cause or for good reason.

Mr. McNaughton may also be entitled to certain payments in the event of a change in control of our Company. If Mr. McNaughton's employment is terminated by us without cause or by Mr. McNaughton for good reason within 18 months of a change in control of our Company, Mr. McNaughton is entitled to receive a lump sum cash payment in an amount equal to the sum of Mr. McNaughton's most recent annual salary and his most recent cash incentive compensation. In addition, in the event of a change in control, all of Mr. McNaughton's stock options or stock-based awards shall accelerate and become immediately exercisable. We will continue to pay health insurance premiums for health insurance coverage for Mr. McNaughton and his immediate family for a period of one year following his termination as a result of a change in control.

Mr. McNaughton will not be entitled to severance payments unless mutually agreed upon in writing if Mr. McNaughton is terminated for cause, due to death or disability, or he terminates his employment without good reason. In the event Mr. McNaughton is terminated due to death or disability, we will continue to pay health insurance premiums for health insurance coverage for Mr. McNaughton and his immediate family for a period of one year following his termination.

Mr. McNaughton is also eligible to receive a gross up payment in the event that any amounts received pursuant to the terms of his employment agreement are subject to the excise tax imposed by Section 4999 of the Internal Revenue Code of 1986, as amended (the "Code"), or any interest or penalties on such excise tax are incurred by Mr. McNaughton. Such payment will be equal to the amount of (i) the excise tax, (ii) any federal, state or local tax resulting from the gross up payment and (iii) any interest and/or penalties assessed with respect to such excise tax. Pursuant to the terms of his employment agreement, Mr. McNaughton is also subject to certain confidentiality, non-solicitation and non-competition obligations. The non-solicitation and non-competition obligations survive during the term of his agreement and for a period of 12 months thereafter.

For purposes of Mr. McNaughton's employment agreement, "cause" means: (A) conduct by Mr. McNaughton constituting a material act of willful misconduct in connection with the performance of his duties; (B) criminal or civil conviction of Mr. McNaughton, a plea of nolo contendere by Mr. McNaughton or conduct by Mr. McNaughton that would reasonably be expected to result in material injury to our reputation if he were retained in his position with us; (C) continued, willful and deliberate non-performance by Mr. McNaughton of his duties; (D) a breach by Mr. McNaughton of his confidentiality, non-solicitation and non-competition obligations to us; or (E) a violation by Mr. McNaughton of our employment policies.

For purposes of Mr. McNaughton's employment agreement, "good reason" means the occurrence of any of the following events: (A) a substantial diminution or other substantive adverse change, not consented to by Mr. McNaughton, in his responsibilities, powers, or duties; (B) any removal of Mr. McNaughton's title of Chief Financial Officer; (C) an involuntary reduction in Mr. McNaughton's annual salary except for across-the-board reductions similarly affecting substantially all management employees; (D) a breach by us of any of our other material obligations under Mr. McNaughton's employment agreement; (E) the involuntary relocation of our offices at which Mr. McNaughton is principally employed to a location more than 30 miles from our current offices; or (F) our failure to obtain the agreement from any successor company to us to assume and agree to perform Mr. McNaughton's employment agreement.

Saverio LaFrancesca, M.D.

We entered into an employment agreement with Dr. LaFrancesca dated as of April 8, 2014 effective as of April 14, 2014, appointing Dr. LaFrancesca as our Chief Medical Officer. We entered into an amendment to Dr. LaFrancesca's employment agreement on March 24, 2016. Dr. LaFrancesca's employment agreement has a term of one year, but will automatically renew for successive one year periods unless either party provides 90 days' notice that it does not wish to extend the agreement. Dr. LaFrancesca's employment agreement provides for an annual base salary in the amount of four hundred thousand dollars (\$400,000) which will be reevaluated on an annual basis by the Board of Directors or the compensation committee. Dr. LaFrancesca also received an option to purchase 100,000 shares of our common stock upon the commencement of his employment, which vests in four equal installments on January 1 of 2015, 2016, 2017 and 2018. Dr. LaFrancesca is eligible to receive cash incentive compensation as determined by the Board of Directors or the compensation committee, and is also eligible to participate in all of our employee benefit plans, including without limitation, retirement plans, stock option plans, stock purchase plans and medical insurance plans.

Dr. LaFrancesca's employment agreement also provides for payments to be made to Dr. LaFrancesca in the event of his termination under certain circumstances. If Dr. LaFrancesca's employment is terminated by us without "cause" (as such term is defined in Dr. LaFrancesca's employment agreement) or by Dr. LaFrancesca for "good reason" (as such term is defined in Dr. LaFrancesca's employment agreement), we are obligated to pay Dr. LaFrancesca the sum of his average annual base salary for the prior three fiscal years or annual salary for the prior fiscal year, whichever is higher, and his average annual cash incentive compensation for the prior three fiscal years or annual cash incentive compensation for the prior fiscal year, whichever is higher. Such payment is conditioned upon Dr. LaFrancesca's

execution of a general release of claims against us. In addition, all of Dr. LaFrancesca's stock options or stock-based awards that would otherwise vest within the 12 month period following such termination shall accelerate and become immediately exercisable. We shall continue to pay health insurance premiums for health insurance coverage for Dr. LaFrancesca and his immediate family for a period of one year following his termination without cause or for good reason.

Dr. LaFrancesca may also be entitled to certain payments in the event of a change in control of our Company. If Dr. LaFrancesca's employment is terminated by us without cause or by Dr. LaFrancesca for good reason within 18 months of a change in control of our Company, Dr. LaFrancesca is entitled to receive a lump sum cash payment in an amount equal to the sum of Mr. Dr. LaFrancesca's current or most recent annual salary and his most recent cash incentive compensation. In addition, in the event of a change in control, all of Dr. LaFrancesca's stock options or stock-based awards shall accelerate and become immediately exercisable. We will continue to pay health insurance premiums for health insurance coverage for Dr. LaFrancesca and his immediate family for a period of one year following his termination as a result of a change in control.

Dr. LaFrancesca will not be entitled to severance payments unless mutually agreed upon in writing if Dr. LaFrancesca is terminated for cause, due to death or disability, or he terminates his employment without good reason. In the event Dr. LaFrancesca is terminated due to death or disability, we will continue to pay health insurance premiums for health insurance coverage for Dr. LaFrancesca and his immediate family for a period of one year following his termination.

Pursuant to the terms of his employment agreement, Dr. LaFrancesca is also subject to certain confidentiality, non-solicitation and non-competition obligations. The non-solicitation and non-competition obligations survive during the term of his agreement and for a period of 12 months thereafter.

For purposes of Dr. LaFrancesca's employment agreement, "cause" means: (A) conduct by Dr. LaFrancesca constituting a material act of willful misconduct in connection with the performance of his duties; (B) criminal or civil conviction of Dr. LaFrancesca, a plea of nolo contendere by Dr. LaFrancesca or conduct by Dr. LaFrancesca that would reasonably be expected to result in material injury to our reputation if he were retained in his position with us; (C) continued, willful and deliberate non-performance by Dr. LaFrancesca of his duties; (D) a breach by Dr. LaFrancesca of his confidentiality, non-solicitation and non-competition obligations to us; or (E) a violation by Dr. LaFrancesca of our employment policies.

For purposes of Dr. LaFrancesca's employment agreement, "good reason" means the occurrence of any of the following events: (A) a substantial diminution or other substantive adverse change, not consented to by Dr. LaFrancesca, in his responsibilities, authorities, powers, functions or duties; (B) any removal of Dr. LaFrancesca's title of Chief Medical Officer; (C) an involuntary reduction in Dr. LaFrancesca's annual salary except for across-the-board reductions similarly affecting substantially all management employees; (D) a breach by us of any of our other material obligations under Dr. LaFrancesca's employment agreement; (E) the involuntary relocation of our offices at which Dr. LaFrancesca is principally employed to a location more than 30 miles from our current offices; or (F) our failure to obtain the agreement from any successor company to us to assume and agree to perform Dr. LaFrancesca's employment agreement.

Retirement and Other Benefits

We have established a 401(k) tax-deferred savings plan, which permits participants, including our named executive officers, to make contributions by salary deduction pursuant to Section 401(k) of the Code. We are responsible for administrative costs of the 401(k) plan. We may, in our discretion, make matching contributions to the 401(k) plan. In addition, all full-time employees, including our named executive officers, may participate in our health and welfare benefit programs, including medical coverage, vision coverage, dental coverage, disability insurance, and life insurance.

DIRECTOR COMPENSATION

We use a combination of cash and stock-based incentive compensation to attract and retain qualified candidates to serve on our Board of Directors. In setting director compensation, the Board of Directors and the Compensation Committee consider the significant amount of time that directors expend in fulfilling their duties to the Company as well as the skill-level required by the Company of members of the Board of Directors.

Directors who are also employees of the Company receive no additional compensation for service as a director.

Each non-employee director that is elected to our Board of Directors will receive a non-qualified stock option to purchase 25,000 shares of our Common Stock vesting one year from the date of grant and granted on the fifth business day following his or her initial election to the Board of Directors. Each non-employee director also receives an annual retainer of \$30,000 paid in four equal quarterly installments. Each non-employee director is also entitled to receive a non-qualified stock option to purchase 25,000 shares of our Common Stock vesting one year from the date of grant and granted on the third business day following the issuance of our earnings release for year-end results.

Non-employee directors continue to be reimbursed for their expenses incurred in connection with attending Board of directors and committee meetings.

Director Compensation Table

The following table presents the compensation provided by us to the non-employee directors who served during the fiscal year ended December 31, 2016.

Name ⁽¹⁾	Fees earned or paid in cash	Option awards (1)(2)	Total
John J. Canepa	\$30,000	\$26,513	\$56,513
John F. Kennedy	\$30,000	\$26,513	\$56,513
Blaine H. McKee	\$23,736	\$55,378	\$79,114
Thomas H. Robinson	\$30,000	\$26,513	\$56,513

David Green \$12,115 \$26,513 \$38,628

Based on the aggregate grant date fair value computed awards in accordance with the provisions of FASB ASC 718, "Compensation — Stock Compensation" excluding the impact of estimated forfeitures. Assumptions used in the calculation of this amount are included under 2013 Plan Valuation and Expense Information under (1) Share-Based-Payment Accounting in Note 13 to our audited financial statements for the fiscal year ended December 31, 2015, included in our Annual Report on Form 10-K filed with the Securities and Exchange Commission on March 30, 2016.

The aggregate number of option awards outstanding at our 2016 fiscal year end and held by the non-employee directors were as follows: 75,000 for Mr. Canepa; 80,026 for Mr. Kennedy; 50,000 for Mr. McKee; 75,000 for Mr. Robinson; and 775,627 for Mr. Green. With respect to Mr. Kennedy, these holdings include grants of options to (2) purchase 5,026 shares that were issued by our Company in connection with the required adjustment to the similar outstanding equity awards held by him and issued by Harvard Bioscience resulting from the impact of the spin-off of our Company by Harvard Bioscience.

OUTSTANDING EQUITY AWARDS AT FISCAL YEAR-END

The following table sets forth information concerning the number and value of exercisable and unexercisable options to purchase Common Stock, and the number of restricted stock units held by our named executive officers as of December 31, 2016.

	Option Awards				Restricted
	Number of Securities Underlying Unexercised Options (#) Exercisable	Number of Securities Underlying Unexercised Options (#) Unexercisable	Option Exercise Price (\$)	Option Expiration Date	Stock Units Number of Securities Underlying Restricted Stock Units
James McGorry	25,000	—	\$ 4.29	11/18/2023	—
	25,000	—	\$ 1.84	5/29/2025	—
	167,850	503,550	(1) \$ 1.38	7/6/2025	—
Thomas McNaughton		150,000	(2) \$ 1.69	3/22/2026	—
		75,000	(3) \$ 1.69	3/22/2026	—
	25,000	75,000	(4) \$ 1.40	9/1/2025	—
	21,250	63,750	(5) \$ 1.84	5/29/2025	—
	108,844	36,282	(6) \$ 4.29	11/18/2023	—
	48,375	24,188	(7) \$ 4.29	11/18/2023	—
	1,546	515	(8) \$ 5.22	5/31/2023	268 (9)
	4,383	—	\$ 3.67	6/1/2022	—
2,769	—	\$ 5.79	6/2/2021	—	
11,108	—	\$ 3.27	5/21/2019	—	
5,544	—	\$ 2.90	11/14/2018	—	
<i>Saverio LaFrancesca, M.D.</i>	50,000	50,000	(10) \$ 8.66	5/1/2024	—
	25,000	75,000	(11) \$ 4.08	3/4/2025	—
	10,000	30,000	(11) \$ 1.84	5/29/2025	—
	40,000	120,000	(13) \$ 1.40	8/31/2025	—
	—	75,000	(14) \$ 1.69	3/22/2026	—

(1) The option was granted on July 6, 2015 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on January 1 of each of 2017, 2018 and 2019.

- (2) The option was granted on March 22, 2016 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on March 22 of each of 2017, 2018, 2019 and 2020.
- (3) The option was granted on March 22, 2016 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on March 22 of each of 2017, 2018, 2019 and 2020.
- (4) The option was granted on August 31, 2015 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on August 31 of each of 2017, 2018 and 2019.
- (5) The option was granted on May 29, 2015 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on May 29 of each of 2017, 2018 and 2019.
- (6) The option was granted on November 1, 2013 and, assuming continued employment with our Company, the unvested shares become exercisable on January 1, 2017.

The option was granted on November 18, 2013 and, assuming continued employment with our Company, the unvested shares become exercisable in two equal increments subject to the achievement of certain milestone targets determined by our Board of Directors.

- (8) The option was granted on November 1, 2013 and, assuming continued employment with our Company, the unvested shares become exercisable on January 1, 2017.
- (9) The restricted stock units were granted on November 1, 2013 and, assuming continued employment with our Company, these restricted stock units vest on January 1, 2017.
- (10) The option was granted on May 1, 2014 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on May 1 of each of 2017 and 2018.
- (11) The option was granted on March 4, 2015 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on March 4 of each of 2017, 2018 and 2019.
- (12) The option was granted on May 29, 2015 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on May 29 of each of 2017, 2018 and 2019.
- (13) The option was granted on August 31, 2015 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on August 31 of each of, 2017, 2018 and 2019.
- (14) The option was granted on March 23, 2016 and, assuming continued employment with our Company, the unvested shares become exercisable in equal installments on March 23 of each of 2017, 2018, 2019 and 2020.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS

The following table sets forth information regarding the beneficial ownership of our Common Stock as of December 30, 2016 by: (i) all persons known by us to own beneficially more than 5% of our voting securities; (ii) each of our directors; (iii) each of our named executive officers; and (iv) all of our current directors and executive officers as a group.

The number of shares beneficially owned by each stockholder is determined under rules issued by the SEC and includes voting or investment power with respect to securities. Under these rules, beneficial ownership includes any shares as to which the individual or entity has sole or shared voting power or investment power and includes any shares as to which the individual or entity has the right to acquire beneficial ownership within 60 days after December 30, 2016 through the exercise of any warrant, stock option or other right. The inclusion of such shares, however, does not constitute an admission that the named stockholder is a direct or indirect beneficial owner of such shares. Common stock subject to options currently exercisable, or exercisable within 60 days after December 30, 2016, are deemed outstanding for the purpose of computing the percentage ownership of the person holding those options, but are not deemed outstanding for computing the percentage ownership of any other person.

Unless otherwise indicated below, to our knowledge, all persons named in the table have sole voting and investment power with respect to their shares of Common Stock, except to the extent spouses share authority under community property laws.

Name and Address of Beneficial Owner ⁽¹⁾	Common Stock Beneficially Owned			
	Shares	Percent Prior to Offering ⁽²⁾	Percent Following Completion of Offering ⁽²⁾	
Greater than 5% Holders				
David Green	1,288,886	7.2	% ⁽³⁾	% ⁽³⁾
First Pecos LLC and affiliates	1,077,018	6.3	% ⁽⁴⁾	% ⁽⁴⁾
Named Executive Officers				
James J. McGorry	512,000	2.9	% ⁽⁵⁾	% ⁽⁵⁾
Thomas W. McNaughton	447,824	2.6	% ⁽⁶⁾	% ⁽⁶⁾
Saverio LaFrancesca, M.D.	168,998	1.0	% ⁽⁷⁾	* ⁽⁷⁾
Non-Employee Directors				
John J. Canepa	67,241		* ⁽⁸⁾	* ⁽⁸⁾
John F. Kennedy	113,432		* ⁽⁹⁾	* ⁽⁹⁾
Thomas H. Robinson	100,000		* ⁽⁸⁾	* ⁽⁸⁾
Blaine H. McKee	—	*		*
	1,409,495	7.8	% ⁽¹⁰⁾	% ⁽¹⁰⁾

All current executive officers and directors, as a group (7 persons)

*Represents less than 1% of all of the outstanding shares of Common Stock.

(1) Unless otherwise indicated, the address for all persons shown is c/o Biostage, Inc., 84 October Hill Road, Suite 11, Holliston, Massachusetts 01746.

(2) Based on 17,108,968 shares of Common Stock outstanding on December 31, 2016, together with the applicable options for each stockholder that become exercisable within 60 days.

(3) Includes options to acquire 750,627 shares that are exercisable within 60 days of December 31, 2016, and 538,259 shares.

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This information is based solely upon an amended Schedule 13D filed jointly by First Pecos LLC (“Pecos”), Banco (4) Panamericano, Inc. (“Banco”), Leslie Jabine (“Jabine”) and Chip Greenblatt (“Greenblatt”) on October 27, 2016 reporting beneficial ownership as of October 20, 2016. Consists of:

- (a) 547,000 shares held by Pecos;
- (b) 490,018 shares held by Banco; and
- (c) 40,000 shares held by Jabine.

Greenblatt, as sole manager of Pecos and sole director of Banco, has voting and investment power with respect to the shares held by those entities.

(5) Includes options to acquire 385,700 shares exercisable within 60 days of December 31, 2016, and 126,300 shares.

(6) Includes options to acquire 241,696 shares exercisable within 60 days of December 31, 2016, and 206,128 shares.

(7) Includes options to acquire 125,000 shares exercisable within 60 days of December 31, 2016, and 43,998 shares.

(8) Includes options to acquire 50,000 shares exercisable within 60 days of December 31, 2016 and 17,241 shares.

(9) Includes options to acquire 55,026 shares that are exercisable within 60 days of December 31, 2016, and 58,406 shares.

(10) Includes options to acquire 907,422 shares that are exercisable within 60 days of December 31, 2016 and 502,073 shares.

EQUITY COMPENSATION PLAN INFORMATION

The following table sets forth information as of December 31, 2016 concerning the number of shares of Common Stock issuable under our existing equity compensation plans.

Plan Category	Number of Securities to be Issued Upon	Weighted Average Exercise Price of	Number of Securities Remaining Available For
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	Exercise of Outstanding Options, Restricted Stock Units, Warrants and Rights	Outstanding Options, Warrants, and Rights	Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column (a))
	(a)	(b)	(c)
Equity compensation plans approved by security holders ⁽¹⁾	3,878,082	\$ 2.80	2,036,994 ⁽²⁾
Equity compensation plans not approved by security holders	—	—	—
Total	3,878,082	\$ 2.80	2,036,994

(1) Consists of our 2013 Equity Incentive Plan, or 2013 Plan, and our Employee Stock Purchase Plan.

(2) Includes 1,945,632 shares available for future issuance under our 2013 Plan and 91,362 shares available for future issuance under our Employee Stock Purchase Plan.

CERTAIN RELATIONSHIPS AND RELATED PARTY TRANSACTIONS

The Audit Committee charter sets forth the standards, policies and procedures that we follow for the review, approval or ratification of any related person transaction that we are required to report pursuant to Item 404(a) of Regulation S-K promulgated by the Securities and Exchange Commission. Under the Audit Committee charter, which is in writing, the Audit Committee must conduct an appropriate review of these related person transactions on an ongoing basis, and the approval of the Audit Committee is required for all such transactions. The Audit Committee relies on management to identify related person transactions and bring them to the attention of the Audit Committee.

During the 2015 and 2016 fiscal years, we were not a participant in any related person transactions that required disclosure under this heading except as it relates to (i) our engagement of, and payment during 2015 of \$166,645 to RobinsonButler, an executive recruiting consultancy firm where Thomas Robinson, a member of our Board of Directors, is a partner, to complete the search for our President and Chief Executive Officer, and (ii) our commercial agreements with Harvard Bioscience that were entered into in connection with the spin-off of our Company. Harvard Bioscience remained a related party during a portion of 2015, due in part to Mr. Green, our former Chairman and CEO, also being a director of Harvard Bioscience. Since Mr. Green resigned from the positions of Chairman and CEO of Biostage on April 17, 2015, Harvard Bioscience is no longer considered a related party. These commercial agreements with Harvard Bioscience include: (i) a Separation and Distribution Agreement to effect the separation and spin-off distribution and provide other agreements to govern our relationship with Harvard Bioscience after the spin-off; (ii) an Intellectual Property Matters Agreement, which governs various intellectual property related arrangements between our Company and Harvard Bioscience, including the separation of intellectual property rights between us and Harvard Bioscience, as well as certain related cross-licenses between the two companies; (iii) a Product Distribution Agreement, which provides that each company will become the exclusive distributor for the other party for products such other party develops for sale in the markets served by the other; (iv) a Tax Sharing Agreement, which governs the parties respective rights, responsibilities and obligations with respect to tax liabilities and benefits, tax attributes, the preparation and filing of tax returns, the control of audits and other tax proceedings and other matters regarding taxes for periods before, during and after the spin-off; (v) a Transition Services Agreement, which provided for certain services to be performed on a transitional basis by Harvard Bioscience to facilitate our transition into a separate public reporting company for time frames of limited length, which expired in 2014; and (vi) a Sublease of approximately 17,000 square feet of mixed use space of the facility located at 84 October Hill Road, Suite 11, Holliston, Massachusetts, which is our corporate headquarters.

As part of the Transition Services Agreement, and for up to one year following the spin-off date, Harvard Bioscience provided certain support services to us, including, among others, accounting, payroll, human resources and information technology services, with the charges for the transition services generally intended to allow Harvard Bioscience to fully recover the costs directly associated with providing the services, plus all out-of-pocket costs and expenses. In connection with the spin-off and in accordance with these agreements, Harvard Bioscience contributed capital of approximately \$15.0 million to us to fund our operations, and transferred to us approximately \$0.8 million in assets, made up primarily of property, plant and equipment. As these agreements evidence ongoing commercial arrangements which may involve varying amounts over time, we are unable to provide an approximate dollar value of the amount involved in the transaction. In fiscal 2015, we paid approximately \$0.2 million to Harvard Bioscience with

respect to the Transition Services Agreement, Sublease and related cost, and research and development supplies. With respect to such approximate amount paid during fiscal 2015, approximately \$50,000 was paid during the period that Harvard Bioscience continued to be a related party. Neither Mr. Green nor Mr. McNaughton receive any amounts from the transactions with Harvard Bioscience relating to their roles as current or former executive officers, and a director as to Mr. Green, of our Company, and it is our understanding that neither Mr. Green nor Mr. McNaughton receive any direct amounts from such agreements and the transactions in relation to their former roles as executive officers of Harvard Bioscience, and Mr. Green's continued role as a director of such company, and their interest is limited to benefits they may receive solely relating to their ongoing roles as executive officer, as to Mr. McNaughton, and director, as to Mr. Green, and stockholders of our Company. As a non-employee director of Harvard Bioscience, Mr. Green also is entitled to receive director compensation that all non-employee directors are entitled to receive under Harvard Bioscience's director compensation programs.

SHARES ELIGIBLE FOR FUTURE SALE

Future sales of substantial amounts of our common stock in the public market, including shares issued upon exercise of outstanding options or warrants, or the anticipation of these sales, could adversely affect market prices prevailing from time to time and could impair our ability to raise capital through sales of equity securities.

Sale of Restricted Securities

Shares of our common stock beneficially owned by individuals who are our affiliates will be restricted securities under the Securities Act. Individuals who may be considered our affiliates are those individuals who control, are controlled by or are under common control with us, as those terms generally are interpreted for federal securities law purposes. These individuals may include some or all of our directors and executive officers. Individuals who are our affiliates will be permitted to sell their shares of our common stock only pursuant to an effective registration statement under the Securities Act, or an exemption from the registration requirements of the Securities Act, such as those afforded by Section 4(a)(1) of the Securities Act or Rule 144 thereunder.

Rule 144

In general, under Rule 144 as currently in effect, a person (or persons whose shares are aggregated), including an affiliate, who beneficially owns “restricted securities” of a “reporting company” may not sell these securities until the person has beneficially owned them for at least six months. Thereafter, affiliates may not sell within any three-month period a number of shares in excess of the greater of: (i) 1% of the then outstanding shares of common stock as shown by the most recent report or statement published by the issuer; and (ii) the average weekly reported trading volume in such securities during the four preceding calendar weeks.

Sales under Rule 144 by our affiliates also will be subject to restrictions relating to manner of sale, notice and the availability of current public information about us and may be affected only through unsolicited brokers’ transactions.

Persons not deemed to be affiliates who have beneficially owned “restricted securities” for at least six months but for less than one year may sell these securities, provided that current public information about us is “available,” which means that, on the date of sale, we are current in our Exchange Act filings. After beneficially owning “restricted securities” for one year, our non-affiliates may engage in unlimited re-sales of such securities.

LEGAL MATTERS

Certain legal matters with respect to the validity of the securities offered by this prospectus will be passed upon for us by Burns & Levinson LLP, Boston, MA. Certain legal matters in connection with this offering will be passed upon for the placement agent by Ellenoff Grossman & Schole LLP, New York, NY.

EXPERTS

The consolidated financial statements of Biostage, Inc. as of December 31, 2015 and 2014, and for each of the years in the two-year period ended December 31, 2015, have been incorporated by reference herein and in the registration statement in reliance upon the report of KPMG LLP, independent registered public accounting firm, incorporated by reference herein, and upon the authority of said firm as experts in accounting and auditing.

The audit report covering the December 31, 2015 consolidated financial statements contains an explanatory paragraph that states that the Company has suffered recurring losses from operations and will require additional financing to fund future operations which raise substantial doubt about its ability to continue as a going concern. The consolidated financial statements do not include any adjustments that might result from the outcome of that uncertainty.

WHERE YOU CAN FIND MORE INFORMATION

We are subject to the information requirements of the Exchange Act and, in accordance therewith, file annual, quarterly and special reports, proxy statements and other information with the SEC. You may read and copy any document we file at the SEC's Public Reference Room at 100 F Street, Washington, D.C. 20549. You may call the SEC at 1-800-SEC-0330 for further information on the operation of the Public Reference Room. These documents also may be accessed through the SEC's electronic data gathering, analysis and retrieval system, or EDGAR, via electronic means, including the SEC's home page on the Internet (www.sec.gov).

We post on our public website (<http://www.biostage.com>) our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act, as soon as reasonably practicable after we electronically file such material with, or furnish it to, the SEC. Our website and the information contained on that site, or connected to that site, are not incorporated into and are not a part of this prospectus.

We have the authority to designate and issue more than one class or series of stock having various preferences, conversion and other rights, voting powers, restrictions, limitations as to dividends, qualifications, and terms and conditions of redemption. See "Description of Capital Stock." We will furnish a full statement of the relative rights and preferences of each class or series of our stock which has been so designated and any restrictions on the ownership or transfer of our stock to any shareholder upon request and without charge. Written requests for such copies should be directed to Biostage, Inc., 84 October Hill Road, Suite 11, Holliston, Massachusetts 01746-1371, or by telephone request to (774) 233-7300.

INCORPORATION OF CERTAIN INFORMATION BY REFERENCE

The SEC allows us to incorporate by reference the information and reports we file with them under File No. 001-35853, which means that we can disclose important information to you by referring you to those publicly available documents. The information incorporated by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede the information already incorporated by reference. We are incorporating by reference the documents listed below, which we have already filed with the SEC, and all documents subsequently filed by us pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, except as to any portion of any future report or document that is not deemed filed under such provisions, prior to the termination of the offering:

- Our Annual Report on Form 10-K for the year ended December 31, 2015;
- Our Quarterly Reports on Form 10-Q for the three months ended March 31, 2016, the three months ended June 30, 2016 and the three months ended September 30, 2016;
- Our Current Reports on Form 8-K filed with the SEC on January 7, 2016, March 10, 2016, March 17, 2016, March 24, 2016, March 31, 2016, May 16, 2016, May 20, 2016, May 26, 2016, October 6, 2016, and November 22, 2016 (in each case, except for information contained therein which is furnished rather than filed); and
- The description of our common stock contained in our registration statement on Form 10-12B filed with the SEC on July 31, 2013 and amended on September 20, 2013 and October 11, 2013.

Any statement contained in a document incorporated or deemed to be incorporated by reference in this prospectus is modified or superseded for purposes of the prospectus to the extent that a statement contained in this prospectus or in any other subsequently filed document that also is or is deemed to be incorporated by reference herein modifies or supersedes such statement.

Upon request, we will provide, without charge, to each person, including any beneficial owner, to whom a copy of this prospectus is delivered a copy of the documents incorporated by reference into this prospectus. You may request a copy of these filings, and any exhibits we have specifically incorporated by reference as an exhibit in this prospectus, at no cost by writing or telephoning us at the following address:

Biostage, Inc.

84 October Hill Road, Suite 11

Holliston, Massachusetts 01746-1371

Telephone: (774) 233-7300.

This prospectus is part of a registration statement we filed with the SEC. We have incorporated exhibits into this registration statement. You should read the exhibits carefully for provisions that may be important to you.

We also incorporate by reference any future filings, other than current reports furnished under Item 2.02 or Item 7.01 of Form 8-K and exhibits filed on such form that are related to such items, made with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act, in each case, other than those documents or the portions of those documents deemed to be furnished and not filed in accordance with SEC rules, until the offering of the securities under the registration statement of which this prospectus forms a part is terminated or completed.

Information in such future filings updates and supplements the information provided in this prospectus. Any statements in any such future filings will be deemed to modify and supersede any information in any document we previously filed with the SEC that is incorporated or deemed to be incorporated herein by reference to the extent that statements in the later filed document modify or replace such earlier statements.

Because we are incorporating by reference future filings with the SEC, this prospectus is continually updated and later information filed with the SEC may update and supersede some of the information included or incorporated by reference in this prospectus. This means that you must look at all of the SEC filings that we incorporate by reference

to determine if any of the statements in this prospectus or in any document previously incorporated by reference have been modified or superseded.

You should rely only on the information incorporated by reference or provided in this prospectus or any prospectus supplement. We have not authorized anyone to provide you with different information. We are not making an offer of these securities in any state where the offer is not permitted. You should not assume that the information in this prospectus or in the documents incorporated by reference is accurate as of any date other than the date on the front of this prospectus or those documents.

**Up to \$8,000,000 in Shares of Common Stock,
Warrants to Purchase Shares of Common Stock and
Shares of Series C Convertible Preferred Stock**

PROSPECTUS

**Rodman & Renshaw
a unit of H.C. Wainwright & Co.**

, 2017

PART II

INFORMATION NOT REQUIRED IN PROSPECTUS

Item 13. Other Expenses of Issuance and Distribution.

The expenses payable by Biostage, Inc. (the “Registrant” or the “Company”) in connection with the issuance and distribution of the securities being registered (other than placement agent fees and expenses) are set forth below. Each item listed is estimated, except for the Securities and Exchange Commission (the “SEC”) registration fee and FINRA filing fees.

Securities and Exchange Commission registration fee	\$928
FINRA filing fees	1,700
Legal fees and expenses	*
Accounting fees and expenses	*
Transfer agent fees and expenses	*
Miscellaneous	*
Total	\$*

*To be provided by amendment.

Item 14. Indemnification of Directors and Officers.

As permitted by Section 102 of the Delaware General Corporation Law, we have adopted provisions in our Amended and Restated Certificate of Incorporation, or our Charter, and Second Amended and Restated Bylaws, or our Bylaws, that limit or eliminate the personal liability of our directors for a breach of their fiduciary duty of care as a director. The duty of care generally requires that, when acting on behalf of the corporation, directors exercise an informed business judgment based on all material information reasonably available to them. Consequently, a director will not be personally liable to us or our stockholders for monetary damages or breach of fiduciary duty as a director, except for liability for:

- any breach of the director’s duty of loyalty to us or our stockholders;

- any act or omission not in good faith or that involves intentional misconduct or a knowing violation of law;
- any act related to unlawful stock repurchases, redemptions or other distributions or payments of dividends; or
- any transaction from which the director derived an improper personal benefit.

These limitations of liability do not affect the availability of equitable remedies such as injunctive relief or rescission. Our Charter also authorizes us to indemnify our officers, directors and other agents to the fullest extent permitted under Delaware law.

As permitted by Section 145 of the Delaware General Corporation Law, our Charter and Bylaws provide that we will indemnify any person who was or is a party or is threatened to be made a party to any threatened, pending or completed action, suit or proceeding by reason of the fact that such person, or a person of whom he or she is the legal representative, is or was our director or officer, or by reason of the fact that our director or officer is or was serving, at our request, as a director, officer, employee or agent of another corporation or of a partnership, joint venture, trust or other enterprise, including service with respect to employee benefit plans maintained or sponsored by us. We will indemnify such persons against expenses (including attorneys' fees), judgments, fines and amounts paid in settlement actually and reasonably incurred in connection with such action if such person acted in good faith and in a manner reasonably believed to be in our best interests and, with respect to any criminal proceeding, had no

reason to believe such person's conduct was unlawful. A similar standard is applicable in the case of derivative actions, except that indemnification only extends to expenses (including attorneys' fees) incurred in connection with the defense or settlement of such actions, and court approval is required before there can be any indemnification where the person seeking indemnification has been found liable to us. Any amendment of this provision will not reduce our indemnification obligations relating to actions taken before an amendment.

Our Charter, filed as an exhibit to our Registration Statement on Form 10-12B filed with the SEC on July 31, 2013, and our Bylaws, filed as an exhibit to our Current Report on Form 8-K filed with the SEC on March 31, 2016, provide for the indemnification provisions described above and elsewhere herein. In addition, we have entered into separate indemnification agreements, a form of which is attached as Exhibit 10.7 to our Registration Statement on Form 10-12B, filed with the Securities and Exchange Commission on July 31, 2013, with our directors and officers which may be broader than the specific indemnification provisions contained in the Delaware General Corporation Law.

These indemnification agreements generally require us, among other things, to indemnify our officers and directors against liabilities that may arise by reason of their status or service as directors or officers, subject to certain exceptions and limitations. These indemnification agreements also require us to advance any expenses incurred by the directors or officers as a result of any proceeding against them as to which they could be indemnified. In addition, we have obtained policies that insure our directors and officers and those of our subsidiaries against certain liabilities they may incur in their capacity as directors and officers. Under these policies, the insurer, on our behalf, may also pay amounts for which we have granted indemnification to the directors or officers. These indemnification provisions and the indemnification agreements may be sufficiently broad to permit indemnification of our officers and directors for liabilities, including reimbursement of expenses incurred, arising under the Securities Act.

Item 15. Recent Sales of Unregistered Securities.

Set forth below is information regarding the shares of common stock and preferred stock and the warrants issued, and options granted, by us in the three years preceding the filing of this registration statement that were not registered under the Securities Act. The offers, sales and issuances of the securities described below were exempt from registration under the Securities Act by virtue of Section 4(a)(2) of the Securities Act.

Aspire Capital, LLC Transaction

On December 15, 2015, we entered into a Common Stock Purchase Agreement (the "Purchase Agreement") with Aspire Capital Fund, LLC, an Illinois limited liability company ("Aspire Capital"), which provided that, upon the terms and subject to the conditions and limitations set forth therein, Aspire Capital was committed to purchase up to an aggregate of \$15.0 million of shares of our common stock (the "Purchase Shares") over the 30-month term set forth in

the Purchase Agreement.

On December 15, 2015, we issued 150,000 shares of its common stock to Aspire Capital in consideration for entering into the Purchase Agreement (the “Commitment Shares”) and sold 500,000 shares to Aspire Capital for an aggregate purchase price of \$1,000,000 (the “Initial Purchase Shares”). Under the Purchase Agreement, the Purchase Shares could be sold by us to Aspire Capital on any business day in two ways: (1) through a regular purchase of up to 150,000 shares at a known price based on the market price of our common stock prior to the time of each sale, and (2) through a VWAP purchase of a number of shares up to 30% of the volume traded on the purchase date at a price equal to the lesser of the closing sale price or 97% of the volume weighted average price for such purchase date.

On May 12, 2016, we issued 150,000 shares of common stock under this arrangement in exchange for gross proceeds of approximately \$371,000. We terminated the Aspire Purchase Agreement effective as of May 17, 2016.

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May 2016 Offering

On May 15, 2016, we entered into a Securities Purchase Agreement (the “Purchase Agreement”) with certain investors (the “Investors”) for the sale by us of 2,836,880 registered shares of our common stock at a purchase price of \$1.7625 per share. Concurrently with the sale of the shares of our common stock, pursuant to the Purchase Agreement we also sold unregistered warrants to purchase 1,418,440 shares of our common stock. The aggregate gross proceeds for the sale of the shares of common stock and the warrants was approximately \$5.0 million. Subject to certain ownership limitations, the warrants will be initially exercisable commencing six months from the issuance date at an exercise price equal to \$1.7625 per share of common stock, subject to adjustments as provided under the terms of the warrants. The warrants are exercisable for five years from the initial exercise date. The closing of the sales of these securities under the Purchase Agreement occurred on May 19, 2016.

We entered into an engagement letter (the “Engagement Letter”) H.C. Wainwright & Co., LLC (“Wainwright”), pursuant to which Wainwright agreed to serve as exclusive placement agent for the issuance and sale of our shares of common stock and the warrants. Pursuant to the Engagement Letter, we granted to Wainwright unregistered warrants to purchase up to 5% of the aggregate number of shares sold in the transactions (the “Wainwright Warrants”). The Wainwright Warrants have substantially the same terms as the warrants.

Item 16. Exhibits and Financial Statement Schedules.

A list of exhibits filed with this registration statement on Form S-1 is set forth on the Exhibit Index and is incorporated herein by reference.

Item 17. Undertakings.

The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or

decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Securities and Exchange Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than a 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

provided, however, that paragraphs (a)(1)(i), (a)(1)(ii) and (a)(1)(iii) of this section do not apply if the information required to be included in a post-effective amendment by those paragraphs is contained in reports filed with or furnished to the Securities and Exchange Commission by the registrant pursuant to Section 13 or Section 15(d) of the Securities Exchange Act of 1934 that are incorporated by reference in the registration statement;

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof;

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering;

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(i) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(ii) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5), or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii), or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in the prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which that prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof; *provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date;

(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of the undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser;

(6) That, for purposes of determining any liability under the Securities Act of 1933, each filing of the registrant's annual report pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934 (and, where applicable, each filing of an employee benefit plan's annual report pursuant to Section 15(d) of the Securities Exchange Act of 1934) that is incorporated by reference in the registration statement shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial bona fide offering thereof; and

(7) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Securities Act of 1933 and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Securities Act of 1933 and will be governed by the final adjudication of such issue.

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SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant has duly caused this Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the Town of Holliston, Commonwealth of Massachusetts, on this 3rd day of January, 2017.

BIOSTAGE, INC.

By: /s/ James J. McGorry
 James J. McGorry
 President and Chief Executive Officer

KNOW ALL BE THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints James McGorry and Thomas McNaughton, and each of them singly (with full power to each of them to act alone), as such person's true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for such person and in such person's name, place and stead, in any and all capacities, to sign any or all amendments (including, without limitation, post-effective amendments) to this registration statement (or any registration statement for the same offering that is to be effective upon filing pursuant to Rule 462(b) under the Securities Act of 1933), and to file the same, with all exhibits thereto, and all documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as such person might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, or any substitute or substitutes of them, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, this Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

Signature	Title	Date
/s/ James J. McGorry James J. McGorry	President and Chief Executive Officer and Director (Principal Executive Officer)	January 3, 2017
/s/ Thomas W. McNaughton Thomas W. McNaughton	Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	January 3, 2017
/s/ John F. Kennedy John F. Kennedy	Chairman	January 3, 2017
/s/ John J. Canepa	Director	January 3, 2017

John J. Canepa

/s/ Blaine H. McKee
Blaine H. McKee

Director

January 3, 2017

/s/ Thomas Robinson
Thomas Robinson

Director

January 3, 2017

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EXHIBITS

EXHIBIT INDEX

Exhibit Number	Description of Exhibit
2.1§ ⁽³⁾	Separation and Distribution Agreement between Biostage, Inc. and Harvard Bioscience, Inc. dated as of October 31, 2013.
3.1 ⁽¹⁾	Amended and Restated Certificate of Incorporation of Biostage, Inc.
3.2 ⁽¹³⁾	Certificate of Amendment to Amended and Restated Certificate of Incorporation of Biostage, Inc., dated as of March 30, 2016
3.3 ⁽¹³⁾	Second Amended and Restated By-laws of the Biostage, Inc.
3.4 ⁽²⁾	Certificate of Designations, Preferences and Rights of Series A Preferred Stock of Biostage, Inc. classifying and designating the Series A Junior Participating Cumulative Preferred Stock.
3.5 ⁽⁶⁾	Certificate of Designation of Series B Convertible Preferred Stock of Biostage, Inc. classifying and designating the Series B Convertible Preferred Stock.
3.6**	Form of Certificate of Designation of Series C Convertible Preferred Stock of Biostage, Inc. classifying and designating the Series C Convertible Preferred Stock.
4.1**	Form of Warrant.
4.3 ⁽¹⁾	Specimen Stock Certificate evidencing shares of common stock.
4.4 ⁽⁷⁾	Specimen Series B Convertible Preferred Stock Certificate.
4.5**	Specimen Series C Convertible Preferred Stock Certificate.
4.6 ⁽²⁾	Shareholder Rights Agreement, dated as of October 31, 2013, between Biostage, Inc. and Registrar and Transfer Company, as Rights Agent.
4.7 ⁽⁶⁾	Amendment to Shareholder Rights Agreement, dated as of February 12, 2015 between Biostage, Inc. and Computershare Trust Company, N.A., as successor to Registrar and Transfer Company.
4.8 ⁽¹⁰⁾	Registration Rights Agreement, dated December 15, 2015, between Biostage, Inc. and Aspire Capital Fund, LLC.
4.9 ⁽¹⁴⁾	Form of Common Stock Purchase Warrant, dated as of May 2016.
5.1**	Opinion of Burns & Levinson LLP
10.1 ⁽³⁾	Intellectual Property Matters Agreement between Biostage, Inc. and Harvard Bioscience, Inc. dated as of October 31, 2013.
10.2 ⁽³⁾	Product Distribution Agreement between Biostage, Inc. and Harvard Bioscience, Inc. dated as of October 31, 2013.
10.3 ⁽³⁾	Tax Sharing Agreement between Biostage, Inc. and Harvard Bioscience, Inc. dated as of October 31, 2013.
10.4 ⁽³⁾	Transition Services Agreement between Biostage, Inc. and Harvard Bioscience, Inc. dated as of October 31, 2013.
10.5 ⁽³⁾	Sublease by and between Biostage, Inc. and Harvard Bioscience, Inc. dated as of October 31, 2013.
10.6# ⁽³⁾	Employment Agreement between Biostage, Inc. and David Green dated as of October 31, 2013.
10.7# ⁽³⁾	Employment Agreement between Biostage, Inc. and Thomas McNaughton dated as of October 31, 2013.
10.8 ⁽¹⁾	Form of Indemnification Agreement for Officers and Directors.
10.8 ⁽¹⁾	2013 Equity Incentive Plan.
10.9 ⁽¹⁾	Employee Stock Purchase Plan.
10.10 ⁽¹⁾	Form of Incentive Stock Option Agreement.
10.11 ⁽¹⁾	Form of Non-Qualified Stock Option Agreement for executive officers.

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- 10.12 ⁽¹⁾ Form of Non-Qualified Stock Option Agreement for directors.
- 10.13 ⁽¹⁾ Form of Deferred Stock Award Agreement.
- 10.14# ⁽¹⁾ Director Compensation Arrangements.
Sublicense Agreement dated as of December 7, 2012 between Biostage, Inc. and Harvard Bioscience, Inc.,
- 10.15 ⁽⁴⁾ and related Trademark License Agreement, dated December 19, 2002, by and between Harvard Bioscience, Inc. and President and Fellows of Harvard College.
- 10.16 ⁽¹⁾ Patent Rights Assignment dated December 21, 2012 between Biostage, Inc. and Dr. Paolo Macchiarini.

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- 10.17⁽¹⁾ Sponsored Research Agreement dated August 5, 2009 by and among Biostage, Inc. (as assignee of Harvard Bioscience, Inc.), Sara Mantero, Maria Adelaide Asnaghi, and Department of Bioengineering of the Politecnico Di Milano
- 10.18⁽⁵⁾ Exclusive License Agreement dated August 6, 2009 by and between Biostage, Inc. (as assignee of Harvard Bioscience, Inc.) and Sara Mantero and Maria Adelaide Asnaghi.
- 10.19⁽¹⁾ Novel Surgery Agreement dated as of May 21, 2012 between Biostage, Inc. and State Budget Institution of Public Health Department Regional Clinical Hospital #1 and Vladimir Alekseevich Porhanov.
- 10.20⁽¹⁾ Novel Surgery Agreement dated as of May 24, 2012 between Biostage, Inc. and OSF Healthcare System, owner and operator of Saint Francis Medical Center and Children’s Hospital of Illinois, and Mark Holterman, M.D.
- 10.21⁽¹⁾ Amendment to Novel Surgery Agreement dated as of April 5, 2013 between Biostage, Inc. and OSF Healthcare System, owner and operator of Saint Francis Medical Center and Children’s Hospital of Illinois, and Mark Holterman, M.D.
- 10.22⁽¹⁾ Amendment to Novel Surgery Agreement dated as of June 26, 2013 between Biostage, Inc. and State Budget Institution of Public Health Department Regional Clinical Hospital #1 and Igor S. Polyakov.
- 10.23⁽⁶⁾ Underwriting Agreement dated as of February 12, 2015, between Biostage, Inc. and National Securities Corporation as representative of the underwriters named therein.
- 10.24⁽⁸⁾ Employment Agreement between Biostage, Inc. and James McGorry dated as of June 23, 2015.
- 10.25⁽⁹⁾ Employment Agreement between Biostage, Inc. and Saverio LaFrancesca, M.D. dated as of April 8, 2014.
- 10.26⁽¹⁰⁾ Common Stock Purchase Agreement, dated December 15, 2015 between Biostage, Inc. and Aspire Capital Fund, LLC.
- 10.27⁽¹¹⁾ Amendment to Employment Agreement between Biostage, Inc. and Saverio LaFrancesca, M.D. dated as of March 24, 2016.
- 10.28⁽¹⁴⁾ Form of Securities Purchase Agreement, dated May 15, 2016, between Biostage, Inc. and the Purchasers listed therein.
- 10.29⁽¹⁴⁾ Engagement Letter, dated May 15, 2016, between Biostage, Inc. and Rodman & Renshaw, a unit of H.C. Wainwright & Co., LLC.
- 10.30⁽¹⁵⁾ Amendment to Engagement Letter, dated May 18, 2016, between Biostage, Inc. and Rodman & Renshaw, a unit of H.C. Wainwright & Co., LLC.
- 10.31** Form of Placement Agency Agreement.
- 10.32** Form of Securities Purchase Agreement.
- 21.1⁽¹²⁾ Subsidiaries of the Biostage, Inc.
- 23.1** Consent of Burns & Levinson LLP (included in Exhibit 5.1)
- 23.2* Consent of KPMG LLP
- 24.1* Power of Attorney (included in signature page)

(1) Previously filed as an exhibit to the Company’s Registration Statement on Form 10-12B (filed July 31, 2013) and incorporated by reference thereto.

(2) Previously filed as an exhibit to the Company’s Registration Statement on Form 8-A (filed October 31, 2013) and incorporated by reference thereto.

(3) Previously filed as an exhibit to the Company’s Current Report on Form 8-K (filed on November 6, 2013) and incorporated by reference thereto.

- (4) Previously filed as an exhibit to the Company's Amendment No. 2 to Form S-1 Registration Statement (filed on February 15, 2013) and incorporated by reference thereto.

- (5) Previously filed as Exhibit 10.19 to the Registrant's Amendment No. 2 to Form S-1 Registration Statement (filed on February 15, 2013) and incorporated by reference thereto.

- (6) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on February 12, 2015) and incorporated by reference thereto.

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- (7) Previously filed as an exhibit to the Company's Annual Report on Form 10-K (filed on March 27, 2015) and incorporated by reference thereto.
- (8) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on July 6, 2015) and incorporated by reference thereto.
- (9) Previously filed as an exhibit to the Company's Quarterly Report on Form 10-Q (filed on August 14, 2015) and incorporated by reference thereto.
- (10) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on December 15, 2015) and incorporated by reference thereto.
- (11) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on March 24, 2016) and incorporated by reference thereto.
- (12) Previously filed as an exhibit to the Company's Annual Report on Form 10-K (filed on March 30, 2016) and incorporated by reference thereto.
- (13) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on March 31, 2016) and incorporated by reference thereto.
- (14) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on May 16, 2016) and incorporated by reference thereto.
- (15) Previously filed as an exhibit to the Company's Current Report on Form 8-K (filed on May 20, 2016) and incorporated by reference thereto.

* Filed herewith.

**To be filed by amendment.

Management contract or compensatory plan or arrangement.

The schedules and exhibits to the Separation and Distribution Agreement have been omitted. A copy of any omitted § schedule or exhibit will be furnished to the SEC supplementally upon request. The Company will furnish to stockholders a copy of any exhibit without charge upon written request.

†

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Confidential portions of this exhibit have been redacted and filed separately with the SEC pursuant to a confidential treatment request in accordance with Rule 24b-2 of the Securities Exchange Act of 1934, as amended.

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