**Filed Pursuant to Rule 424(b)(5)**
**Registration No. 333-215154**

**PROSPECTUS SUPPLEMENT (To Prospectus dated January 13, 2017)**

**Asterias Biotherapeutics, Inc.**

**4,000,000 Shares of Series A Common Stock**

*We are offering 4,000,000 shares of our Series A Common Stock (the "Shares") to certain investors pursuant to this prospectus supplement and the accompanying prospectus. Each Share will be sold at a price of $2.60 per share.*

*Our Shares are listed on The NYSE American under the trading symbol "AST." On October 13, 2017, the last reported sale price of our Shares was $2.90 per share.*

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

**Investing in our Shares involves significant risks. See "Risk Factors" beginning on page S-7 of this prospectus supplement and page 6 of the accompanying prospectus as well as in our periodic reports filed with the Securities and Exchange Commission and incorporated by reference into this prospectus supplement and the accompanying prospectus.**

**Neither the U.S. Securities and Exchange Commission nor any other regulatory body has approved or disapproved of these securities, or passed upon the accuracy or adequacy of this prospectus supplement or the accompanying prospectus. Any representation to the contrary is a criminal offense.**

We have retained Chardan to act as our exclusive placement agent in connection with the arrangement of this transaction. We have agreed to pay the placement agent the placement agent fee set forth in the table below, which assumes that we sell all of the shares of common stock we are offering. The placement agent is not required to arrange for the sale of any specific number of shares or dollar amount but will use its "reasonable best efforts" to arrange for the sale of the shares.

| | Per Share | Total |
|---|---|---|
| Public Offering price | $ 2.60 | $ 10,400,000 |
| Placement agent fees | $ 0.12[(1)] | $ 499,800[(1)] |
| Proceeds, before expenses, to us | $ 2.48 | $ 9,900,200 |

(1) Except for any shares sold to certain investors referred by us, with respect to which we will pay the placement agent cash fees equal to three percent (3%).

Because there is no minimum offering amount required as a condition to closing in this offering, the actual offering amount, the placement agent fees and net proceeds to us, if any, in this offering may be substantially less than the maximum offering amounts set forth above.

We expect to deliver the Shares against payment on or about October 18, 2017.

**Chardan**

Prospectus Supplement dated October 16, 2017

## TABLE OF CONTENTS

**Prospectus Supplement**



**Prospectus**

## ABOUT THIS PROSPECTUS SUPPLEMENT

This document is in two parts. The first part is this prospectus supplement, which describes the specific terms of the securities we are offering. The second part, the accompanying prospectus dated January 13, 2017, gives more general information about our securities. You should read this prospectus supplement and the accompanying prospectus, including the information incorporated by reference and any free writing prospectuses we have authorized for use in connection with this offering, in their entirety before making an investment decision.

You should rely only on the information contained or incorporated by reference in this prospectus supplement and the accompanying prospectus, along with the information contained in any free writing prospectuses we have authorized for use in connection with this offering. If the description of the offering varies between this prospectus supplement and the accompanying prospectus, you should rely on the information in this prospectus supplement. We have not authorized anyone to provide you with different or additional information. Under no circumstances should the delivery to you of this prospectus supplement and the accompanying prospectus or any sale made pursuant to this prospectus supplement create any implication that the information contained in this prospectus supplement or the accompanying prospectus is correct as of any time after the respective dates of such information.

Unless the context requires otherwise, the words “Asterias,” “we,” the “company,” “us” and “our” refer to Asterias Biotherapeutics, Inc. and the term “you” refers to a prospective investor.

This prospectus supplement and the accompanying prospectus, including the information incorporated by reference into this prospectus supplement and the accompanying prospectus, include trademarks, service marks and trade names owned by us or others. Asterias Biotherapeutics, the Asterias Biotherapeutics logo and other trademarks of Asterias Biotherapeutics appearing in this prospectus supplement are the property of Asterias Biotherapeutics. All other trademarks, service marks and trade names in this prospectus supplement are the property of their respective owners. We have omitted the ® and ™ designations, as applicable, for the trademarks used in this prospectus supplement or the accompanying prospectus.

## PROSPECTUS SUPPLEMENT SUMMARY

*This summary highlights certain information about us, this offering and information appearing elsewhere in this prospectus supplement or the accompanying prospectus and in the documents we incorporate by reference. This summary is not complete and does not contain all of the information that you should consider before investing in our securities. The following summary is qualified in its entirety by, and should be read in conjunction with, the more detailed information and financial statements and notes thereto appearing elsewhere in this prospectus supplement. Before you decide to invest in our securities, to fully understand this offering and its consequences to you, you should carefully read the entire prospectus supplement carefully, including the matters set forth under the caption "Risk Factors" beginning on page S-7 of this prospectus supplement and page 6 of the accompanying prospectus, and the consolidated financial statements and related notes included or incorporated by reference in this prospectus supplement, the accompanying prospectus and the other documents incorporated by reference herein and therein.*

**Business Overview**

We are a biotechnology company focused on the emerging fields of cell therapy and regenerative medicine. We have two core technology platforms. The first is a type of stem cell capable of becoming all of the cell types in the human body, a property called pluripotency. The second is the use of a cell type called "dendritic cells" to teach cancer patients' immune systems to attack their tumors.

We currently have three clinical stage programs based on these platforms: AST-OPC1 is a therapy derived from pluripotent stem cells that is currently in a Phase 1/2a clinical trial for spinal cord injuries; AST-VAC1 is a patient-specific cancer immunotherapy using dendritic cells that has completed a Phase 2a study in Acute Myeloid Leukemia (AML); and AST-VAC2 is a non-patient specific cancer immunotherapy for which the initiation of a Phase 1 clinical trial in non-small cell lung cancer is planned for 2017. Our technology platforms have the potential for application in additional indications, such as advanced multiple sclerosis and white matter stroke for AST-OPC1 and other additional cancer indications for our cancer immunotherapy platform.

**Products Under Development**


**Product Candidates**

***AST-OPC1 Oligodendrocyte Progenitor Cells***

Our AST-OPC1 product candidate for treatment of spinal cord injuries is comprised of oligodendrocyte progenitor cells, which are cells that become oligodendrocytes after injection into the spinal cord. These cells are produced from a master cell bank of undifferentiated human embryonic stem ("hES") cells that meets current Good Manufacturing Practice ("cGMP") requirements and that has been fully qualified for human use. The hES cells are differentiated under cGMP conditions to make a neural cell type known as oligodendrocyte progenitor cells using a specialized manufacturing method. The resulting AST-OPC1 cells, which are stored frozen until ready for use, are screened for adventitious agents and tested for specific release criteria to ensure their identity, purity, and potency. AST-OPC1 cells have been shown to reproduce the natural functions of oligodendrocytes, including three potentially reparative functions that address the complex pathologies observed at the injury site of a spinal cord injury. These activities of AST-OPC1 include production of neurotrophic factors, stimulation of vascularization, and induction of remyelination of denuded axons, all of which are critical for survival, regrowth and conduction of nerve impulses through axons at the injury site.

*Phase I Safety Trial*

As of December 2016, all five patients in our phase I safety trial of our AST-OPC1 in thoracic spinal cord injury ("SCI") have completed five years of follow up under the protocol. No surgical complications during or post-surgery have been observed, and there have been no significant adverse events to date in any patient attributable to the AST-OPC1 product, the surgery to deliver the cells, or the immunosuppressive regimen. There have been no unexpected neurological changes to date, nor has there been evidence of adverse changes or cavitation on multiple MRIs. MRI results in four of the five patients are consistent with prevention of lesion cavity formation. Immune monitoring, conducted in some of the patients, has not detected any evidence of immune responses to AST-OPC1 at time periods of up to one year post-transplant.

*Phase 1/2a Dose Escalation Study: Patients with Neurologically Complete Cervical Spinal Cord Injuries*

We initiated enrollment of the SCiStar Phase 1/2a dose escalation trial of AST-OPC1 in patients with neurologically complete (American Spinal Injury Association Impairment Scale A; AIS-A) cervical injuries in March 2015. In May 2016, we announced that the FDA had approved expansion of the study to include up to 35 patients, including the addition of two cohorts of 5-8 patients with motor complete, sensory incomplete AIS-B injuries. The trial is designed to assess safety and activity of three escalating doses of AST-OPC1 in motor complete cervical SCI, the first targeted indication for AST-OPC1. The trial is an open-label, single-arm study in patients with sub-acute, C-4 to C-7, motor complete (AIS-A and AIS-B) cervical SCI. AST-OPC1 is administered 21 to 42 days post-injury. Patients are followed by neurological exams and imaging procedures to assess the safety and activity of the product.

We have completed enrollment and dosing in four of the five planned SCiStar study cohorts and as of September 2017 we have enrolled three of the five patients in the fifth and final cohort (Cohort 5) of the SCiStar trial. We will report 6-month efficacy and safety data from Cohort 3 (AIS-A; 20 million cells) and Cohort 4 (AIS-B; 10 million cells) in early 2018 after the 6-month results are collected for the two cohorts. We expect to have multiple data readouts from the SCiStar trial in 2018.

In October 2017, we announced new 12-month efficacy and safety data from Cohort 2 (AIS-A; 10 million cells) of the SCiStar trial. The 12-month data showed 67% (4/6) of Cohort 2 patients have recovered 2 or more motor levels on at least one side through 12 months, which is more than double the rates of recovery seen in both matched historical controls and published data in a similar population. As suggested by existing research, patients with severe spinal cord injuries that show two motor levels of improvement on at least one side may regain the ability to perform daily activities such as feeding, dressing and bathing, which significantly reduces the overall level of daily assistance needed for the patient and associated healthcare costs.

In October 2017, we also announced that FDA granted our request for AST-OPC1 to be designated a Regenerative Medicine Advanced Therapy (RMAT) under the 21st Century Cures Act based on a subset of the Cohort 2 data and other data from the SCiStar trial, based on availability of information as of the time of the RMAT application. Additionally, in February 2016, we announced that FDA had granted our application for Orphan Drug Designation of AST-OPC1 for the treatment of acute spinal cord injury.

We received a Strategic Partnerships Award grant from the California Institute for Regenerative Medicine (CIRM), which provides for up to $14.3 million of non-dilutive funding for the Phase 1/2a clinical trial and other product development activities for AST-OPC1, patients to achieving certain milestones. As of September 2017, we had received the entire $14.3 million from CIRM after achieving the necessary milestones to trigger payment.

***AST-VAC1 and AST-VAC2, Cancer Vaccine Candidates Targeting Telomerase***

We are developing two experimental immunotherapeutic programs, AST-VAC1 and AST-VAC2, each designed to attack cancer cells by targeting the cancer cell's expression of telomerase. Both product candidates use an immune cell type known as dendritic cells to stimulate immune responses to telomerase. Dendritic cells are antigen processing and presenting cells that are potent initiators of a cellular and antibody-mediated immune response. Telomerase is a ubiquitous cancer antigen, expressed at high levels in over 85% of all human cancers, but at very low levels or not at all in normal human cells. The premise underlying these vaccines is to "teach" the patient's own immune system to attack cancer cells while sparing other normal healthy cells. In addition to being used as a monotherapy in certain indications, we believe that AST-VAC1 and AST-VAC2 may be synergistic with immune checkpoint inhibitors currently in development for many cancer indications because immune checkpoint inhibitors function by relieving suppressive mechanisms exerted on T-cells by the tumor, whereas AST-VAC1 and AST-VAC2 are designed to specifically target the T-cells to attack the telomerase expressing tumor cells.

*AST-VAC1: Autologous Telomerase-loaded, Dendritic Cells*

AST-VAC1 is an autologous product candidate, which means that the product is derived from cells that come from the treated patient. AST-VAC1 consists of mature antigen-presenting dendritic cells pulsed with RNA for the protein component of human telomerase ("hTERT") and a portion of a lysosomal targeting signal ("LAMP"). LAMP directs the telomerase protein to the lysosome, enabling presentation of telomerase peptides to CD4+ as well as CD8+ T-cells. AST-VAC1 is injected into the patient's skin, with the objective of the dendritic cells traveling to the lymph nodes and instructing T-cells to kill tumor cells that express telomerase on their surface.

*Process Development for AST-VAC1*

On August 3, 2016, we entered into a Development and Manufacturing Services Agreement (the "Services Agreement") with Cognate BioServices, Inc. ("Cognate"), a fully-integrated contract bioservices organization providing development and cGMP manufacturing services to companies and institutions engaged in the development of cell-based products. Under the Services Agreement, Cognate has been performing development studies in support of our clinical and commercial development activities of AST-VAC1 and production and manufacturing of AST-VAC1 under cGMP.

On August 16, 2017, we amended the Services Agreement to modify the timing of certain process development studies being performed by Cognate.

*Phase 2 Trial of AST-VAC1 in Acute Myeloid Leukemia (AML)*

A Phase 2 clinical trial of AST-VAC1 was conducted in patients with AML in complete clinical remission. This trial completed patient enrollment in December 2009. Thirty-three patients with AML entered the trial in their first or second complete remission. Prior to or shortly after completing consolidation chemotherapy, patients underwent leukapheresis, a procedure for collecting white blood cells directly from the patient. AST-VAC1 was produced at a centralized manufacturing facility from the patient-specific white blood cells. Patient blood cells were differentiated to dendritic cells in culture, modified to express telomerase linked to the LAMP targeting signal, aliquoted and cryopreserved. AST-VAC1 was released for patient dosing contingent on meeting several product specifications that included identity of mature dendritic cells, confirmation of telomerase expression, number of viable cells per dose after thawing, and product sterility.

Twenty-one patients received AST-VAC1 in the trial, including 19 in clinical remission and two in early relapse. AST-VAC1 was found to have a favorable safety and tolerability profile in this study over multiple vaccinations, with up to 32 serial vaccinations administered (median = 17). Idiopathic thrombocytopenic purpura (bleeding into the skin caused by low platelets in blood) (grade 3-4) was reported in one patient. Other toxicities (grade 1-2) included rash or headache. Patient immune response to telomerase after vaccination with AST-VAC1 was evaluated using a test called the enzyme-linked immunosorbent spot ("ELISPOT") assay to measure the presence of activated T-cells specific to hTERT. Positive immune responses were detected in 55% of patients.

We subsequently performed follow-up data collection on the 19 patients treated in complete remission to determine the long-term effects of the AST-VAC1 administration on remission duration and disease-free survival. Eleven of 19 patients (58%) remained in complete remission at a median follow-up of 52 months. These results compare to historical data suggesting that between 20-40% of patients would be expected to be relapse free at 3-4 years. Additionally, of the 7 patients in the higher risk over 60 year old group, 4 (57%) remained relapse free at a median follow up of 54 months. Historically, relapse free survival rates in this population have been 10-20% at 3-4 years.

*AST-VAC2: hES Cell-Derived Allogenic Dendritic Cells*

AST-VAC2 is an allogeneic, or non-patient specific, cancer vaccine candidate designed to stimulate patient immune responses to telomerase. AST-VAC2 is produced from hES cells and can be modified with any antigen. We believe that the use of hES, which does not use patient-specific starting material for AST-VAC2, provides a scalable system for the production of a large number of vaccine doses in a single lot. Allogeneic vaccine production has the potential to lower manufacturing costs, enable "off-the-shelf" availability and broader patient availability, and ensure product consistency. In addition, we believe that this approach has the potential to stimulate a more robust immune response through an adjuvant effect of the immune mismatch between the genetic makeup of AST-VAC2 and patients.

*Product Development Strategy for AST-VAC2*

During September 2014, we entered into a Clinical Trial and Option Agreement with Cancer Research UK and Cancer Research Technology Limited ("CRT"), a wholly-owned subsidiary of Cancer Research UK (the "Cancer Research UK Agreement"). The trial will be sponsored, managed and funded by Cancer Research UK. The clinical trial will examine the safety, immunogenicity and activity of AST-VAC2 and position the immunotherapy to be tested for numerous clinical indications and potentially in combination with other check point or immune pathway inhibitors. We will continue to serve in a collaborative and advisory role with Cancer Research UK throughout this process.

In September 2017, we announced that the Medicines and Healthcare Products Regulatory Agency and the NHS Research Ethics Committee provided the necessary approvals to initiate the trial. The trial will administer AST-VAC2 in up to twenty-four patients in two cohorts. In the first cohort, up to 12 patients with advanced non-small cell lung cancer and a specific immunological marker called HLA-A2 will receive AST-VAC2, and will be followed for safety, immune responses to telomerase, and overall clinical survival. The second cohort will evaluate AST-VAC2 in up to 12 patients with the HLA-A2 marker who have had successful resection of their tumor with no evidence of metastasis and each patient will be followed for safety, immune responses to telomerase, overall clinical survival and time to relapse. Both cohorts will have a control group consisting of patients that meet all inclusion/exclusion criteria for the trial except those patients who do not have the HLA-A2 marker. The trial will examine aspects typically found in a Phase 1/2a trial, including the safety, tolerability, immunogenicity and activity of AST-VAC2, but the trial is listed as a Phase 1 trial under its recently approved protocol.

Upon completion of the trial, we will have an exclusive first option to acquire the data generated in the trial. If we exercise that option we will be obligated to make payments upon the execution of the license agreement, upon the achievement of various milestones, and then royalties on sales of the product candidate if it is approved. In connection with the Cancer Research UK Agreement, we sublicensed to Cancer Research UK certain patents that have been licensed or sublicensed to us by third parties for use in the clinical trials and product manufacturing process. We would also be obligated to make payments to those patent licensors and sublicensors upon the achievement of various milestones, and then royalties on sales of products if AST-VAC2 is successfully developed and commercialized.

**Recent Developments**

On October 2, 2017, we announced new 12-month efficacy and safety data from the first efficacy cohort (Cohort 2) in our ongoing Phase 1/2a SCiStar trial. The 12-month data showed 67% of Cohort 2 patients have recovered two or more motor levels on at least one side through 12 months, which is more than double the rates of recovery seen in both matched historical controls and published data in a similar population. We also announced that the FDA granted our request for AST-OPC1 to be designated a Regenerative Medicine Advanced Therapy (RMAT) under the 21st Century Cures Act.

**Corporate Information**

We are a Delaware corporation. Our corporate headquarters are located at 6300 Dumbarton Circle, Fremont, California 94555 and our telephone number is (510) 456-3800. We maintain a website at http://www.asteriasbiotherapeutics.com. Information contained on or linked to our website is not a part of this prospectus supplement or the accompanying prospectus. Our Series A common stock is listed on The NYSE American under the symbol “AST.”

**Implications of Being an Emerging Growth Company**

As a company with less than $1.07 billion in revenue during our last fiscal year, we qualify as an “emerging growth company” as defined in the Jumpstart Our Business Startups Act of 2012 (JOBS Act). An emerging growth company may take advantage of specified reduced reporting and other burdens that are otherwise applicable generally to public companies. These provisions include:

- a requirement to have only two years of audited financial statements and only two years of related management’s discussion and analysis in our annual reports on Form 10-K and in our registration statements and prospectuses;
- exemption from the auditor attestation requirement on the effectiveness of our internal controls over financial reporting;
- reduced disclosure about the company’s executive compensation arrangements; and
- no non-binding advisory votes on executive compensation or golden parachute arrangements.

We may take advantage of these provisions until December 31, 2019 or until such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company upon the earliest of (i) the last day of the first fiscal year in which our annual gross revenues exceed $1.07 billion, (ii) the date on which we are deemed to be a large accelerated filer under Rule 12b-2 under the Exchange Act and (iii) the date on which we, during the previous three-year period, issued more than $1 billion in non-convertible debt. We may choose to take advantage of some but not all of these reduced burdens.

We have elected to take advantage of certain of the reduced disclosure obligations in this prospectus supplement, the accompanying prospectus and in the documents incorporated herein and therein by reference and may elect to take advantage of other reduced reporting requirements in future filings.

The JOBS Act provides that an emerging growth company can take advantage of an extended transition period for complying with new or revised accounting standards. We have irrevocably elected not to avail ourselves of this exemption and, as a result, we adopt new or revised accounting standards on the relevant dates on which adoption of such standards is required for other public companies that are not emerging growth companies.

**THE OFFERING**

| | |
|---|---|
| Common stock offered by us: | 4,000,000 shares of our Series A common stock |
| Offering price | $2.60 per share of Series A common stock |
| Common stock to be outstanding after the offering: | 54,048,774 shares of Series A common stock. |
| Use of proceeds: | We currently expect to use the net proceeds from this offering for clinical trial and process development activities related to our AST-OPC1 program, research and development, capital expenditures, working capital, and other general corporate purposes. See "Use of Proceeds" on page S-9 of this prospectus supplement. |
| NYSE American symbol: | AST |
| Risk factors: | An investment in our securities involves a high degree of risk. See "Risk Factors" beginning on page S-7 of this prospectus supplement, page 8 of the accompanying prospectus and in the documents incorporated by reference into this prospectus supplement for a discussion of factors you should consider carefully when making an investment decision. |

The number of shares our Series A common stock to be outstanding after the offering is based on 50,048,774 shares of our Series A common stock outstanding as of September 30, 2017 and excludes the following :

- 6,728,651 shares of Series A common stock issuable upon exercise of stock options outstanding as of September 30, 2017, at a weighted average exercise price of $3.34 per share;
- 543,500 shares of Series A common stock issuable upon vesting of restricted stock units outstanding as of September 30, 2017;
- 2,813,159 shares of Series A common stock issuable upon exercise of warrants outstanding as of September 30, 2017, at an exercise price of $4.37 per share, which warrants expire on May 13, 2021;
- 2,721,935 shares of Series A common stock reserved for future grant under our 2013 Equity Incentive Plan; and
- An indeterminate number of shares that we may issue from time to time, at its election in lieu of cash, during the term of our services agreement with Cell Therapy Catapult Services Limited in consideration for services to be rendered, with such outstanding consideration as of September 30, 2017 having a value of up to GBP £1,000,000.

There are no shares of our Series B common stock outstanding.

## SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

Some of the statements in this prospectus supplement, the accompanying prospectus, the documents incorporated by reference and any free writing prospectus that we have authorized for use in connection with this offering are forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended. These statements are based on our current expectations, assumptions, estimates and projections about our business and our industry and involve known and unknown risks, uncertainties and other factors that may cause our or our industry's results, levels of activity, performance or achievements to be materially different from any future results, levels of activity, performance or achievements expressed or implied in, or contemplated by, the forward-looking statements. Words such as "believe," "anticipate," "expect," "intend," "plan," "will," "may," "would," "could," "estimate," "potential," "continue," or the negative of such terms or other similar expressions, identify forward-looking statements, but the absence of these words does not necessarily mean that a statement is not forward-looking. In addition, any statements that refer to expectations, projections or other characterizations of future events or circumstances are forward-looking statements. Our actual results and the timing of events may differ significantly from the results discussed in the forward-looking statements. Factors that might cause such a difference include those discussed under the caption "Risk Factors" beginning on page S-7 of this prospectus supplement, page 6 of the accompanying prospectus, in the documents incorporated by reference, in any free writing prospectus that we have authorized for use in connection with this offering or as a result of other circumstances beyond our control. The forward-looking statements made in this prospectus supplement, the accompanying prospectus and any free writing prospectus that we have authorized for use in connection with this offering speak only as of the date on which the statements are made.

We intend that all forward-looking statements be subject to the safe-harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are subject to many risks and uncertainties that could cause actual results to differ materially from any future results expressed or implied by the forward-looking statements. We caution you therefore against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Examples of the risks and uncertainties include, but are not limited to:

- We will require in the near term, but may be unable to secure, significant additional capital to continue our operations, and support our research and development activities;
- We will need to issue additional equity or debt securities in order to raise additional capital needed to pay our operating expenses;
- We will spend a substantial amount of our capital on research and development but we might not succeed in developing products and technologies that are useful in medicine;
- Risks relating to the progress of our clinical trials, including our ability to obtain FDA approval;
- We are subject to government regulation;
- Risks relating to intellectual property rights, such as our ability to obtain or enforce patents, the possibility that we may be subject to patent infringement claims, or the possibility that we may lose our rights to key technologies on which our business depends;
- We have no experience in manufacturing, marketing, selling or distributing products and will depend on third parties to develop and commercialize many of our product candidates and to provide the manufacturing, regulatory compliance, sales, marketing and distribution capabilities required for the success of our business;
- Failure of our internal control over financial reporting could harm our business and financial results; and
- BioTime is our largest shareholder and BioTime has substantial influence on our business and operations.

The forward-looking statements contained in this prospectus supplement or the documents incorporated by reference herein speak only as of their respective dates. Factors or events that could cause our actual results to differ may emerge from time to time and it is not possible for us to predict them all. Except to the extent required by applicable laws, rules or regulations, we do not undertake any obligation to publicly update any forward-looking statements or to publicly announce revisions to any of the forward-looking statements, whether as a result of new information, future events or otherwise.

## RISK FACTORS

*Investing in our securities involves a high degree of risk. You should consider the following risk factors, the risk factors contained in the accompanying prospectus beginning on page 6 and in our Form 10-K for the year ended December 31, 2016 and in our quarterly and current reports filed thereafter, as well as other information contained or incorporated by reference in this prospectus supplement, before deciding to purchase any of our securities. The risks and uncertainties described below and incorporated by reference herein are not the only ones we face. Additional risks and uncertainties not presently known to us or that we currently deem immaterial also may become important factors that affect us. If any of these risks occur, our business could suffer, the market price of our common stock could decline and you could lose all or part of your investment in our securities.*

**Risks Related to this Offering and Our Securities**

**The market price of our common stock historically has been and likely will continue to be highly volatile.**

The market price for our Shares historically has been highly volatile, and the market for our Shares has from time to time experienced significant price and volume fluctuations, based both on our operating performance and for reasons that appear to us unrelated to our operating performance. The market price of our Shares may fluctuate significantly in response to a number of factors, including:

- the level of our financial resources;
- announcements of entry into or consummation of a financing or strategic transaction;
- changes in the regulatory status of our product candidates, including results of any clinical trials and other research and development programs;
- FDA or foreign regulatory actions and regulatory developments in the United States and foreign countries;
- announcements of new products or technologies, commercial relationships or other events (including clinical trial results and regulatory events and actions) by us or our competitors;
- market conditions in the pharmaceutical, biopharmaceutical, specialty pharmaceutical and biotechnology sectors;
- developments concerning intellectual property rights generally or those of us or our competitors;
- changes in securities analysts' estimates of our financial performance or deviations in our business and the trading price of our common stock from the estimates of securities analysts;
- events affecting any future collaborations, commercial agreements and grants;
- fluctuations in stock market prices and trading volumes of similar companies;
- sales of large blocks of our common stock, including sales by significant stockholders, our executive officers or our directors or pursuant to shelf or resale registration statements that register shares of our common stock that may be sold by us or certain of our current or future stockholders;
- discussion of us or our stock price by the financial and scientific press and in online investor communities;
- commencement of delisting proceedings by the NYSE American; and
- additions or departures of key personnel.

**Our management will have broad discretion with respect to the use of the proceeds of this offering.**

Although we have highlighted the intended use of proceeds for this offering, our management will have broad discretion as to the application of these net proceeds and could use them for purposes other than those contemplated at the time of this offering. Our stockholders may not agree with the manner in which our management chooses to allocate and spend the net proceeds. It is possible that the proceeds will be invested in a way that does not yield a favorable, or any, return for our company.

**You will experience immediate dilution in the book value per share of the Shares you purchase.**

Investors who purchase our Shares in this offering will experience immediate dilution in their net tangible book value per share to the extent of the difference between the public offering price per share and the "as adjusted" net tangible book value per share after giving effect to the offering. After giving effect to an assumed sale of an aggregate of four million Shares, the reported closing price of our Shares on the NYSE American on June 30, 2017, and after deducting the commissions and the estimated aggregate offering expenses payable by us, and our net tangible book value as of June 30, 2017, investors would suffer an immediate dilution of $2.04 per share in the net tangible book value of their Shares. This calculation assumes that all sales in this offering will occur at once. See "Dilution" on page S-11 for a more detailed discussion of the dilution you will incur in this offering.

**If we raise additional capital in the future, your ownership in us could be diluted.**

Any issuance of equity we may undertake in the future to raise additional capital could cause the price of our Shares to decline, or require us to issue shares at a price that is lower than that paid by holders of our Shares in the past, which would result in those newly issued shares being dilutive. If we obtain funds through a credit facility or through the issuance of debt or preferred securities, these securities would likely have rights senior to your rights as a common shareholder, which could impair the value of our Shares.

## USE OF PROCEEDS

We estimate that the net proceeds from the sale of the Shares that we are offering, after deducting the placement agent fee, will be approximately $9.9 million.

We will retain broad discretion over the use of the net proceeds from this offering. We currently expect to use the net proceeds from this offering for clinical trial and process development activities related to its AST-OPC1 program, research and development, capital expenditures, working capital, and other general corporate purposes.

Pending the use of the net proceeds, we expect to invest the net proceeds in investment grade, interest-bearing securities.

## CAPITALIZATION

The following sets forth our cash and cash equivalents and capitalization on a consolidated basis as of June 30, 2017. We have presented our capitalization on both an actual and an as adjusted basis to reflect the issuance and sale of the Shares offered hereby, but not the application of the net proceeds from the issuance and sale of such Shares. See "Use of Proceeds." You should read the following table along with our financial statements and the accompanying notes to those statements, together with the information set forth under "Management's Discussion and Analysis of Financial Condition and Results of Operations" in our Annual Report on Form 10-K for the year ended December 31, 2016, and in our subsequent Quarterly Reports and Current Reports, which are incorporated by reference in this prospectus supplement and the accompanying prospectus.

| | As of June 30, 2017 (in thousands, except par value) | |
|---|---|---|
| | Actual | As Adjusted |
| Cash and Cash Equivalents | $ 11,875 | $ 21,775 |
| Debt | - | - |
| Stockholders' equity: | | |
| Preferred stock, $0.0001 par value, 5,000 shares authorized; none issued or outstanding | - | - |
| Common Stock, $0.0001 par value, authorized 75,000 Series A Common Stock and 75,000 Series B Common Stock; 49,556 shares Series A Common Stock issued and outstanding at June 30, 2017; no Series B Common Stock issued and outstanding at June 30, 2017 | 5 | 5 |
| Additional paid-in capital | 138,659 | 148,559 |
| Accumulated other comprehensive gain (loss) on available-for-sale investments | (3,206) | (3,206) |
| Accumulated deficit | (98,743) | (98,743) |
| Total stockholders' equity | 36,715 | 46,615 |
| Total capitalization | $ 36,715 | $ 46,615 |

The foregoing discussion and table are based on 49,555,959 shares issued and outstanding as of June 30, 2017, and excludes:

- 6,865,212 Shares underlying options outstanding, at a weighted average exercise price of $3.36 per share;
- 593,500 Shares issuable upon vesting of restricted stock units;
- 2,813,159 Shares underlying warrants issued May 13, 2016 outstanding, at an exercise price of $4.37 per share, expiring May 13, 2021;
- 2,670,792 Shares available for future grant under our 2013 Equity Incentive Plan; and
- An indeterminate number of shares that we may issue from time to time, at our election in lieu of cash, during the term of the Company's services agreement with Cell Therapy Catapult Services Limited in consideration for services to be rendered having a value of up to GBP £1,300,000.

## DIVIDEND POLICY

We have never declared or paid cash dividends on our capital stock. We currently intend to retain our future earnings, if any, for use in our business and therefore do not anticipate paying cash dividends in the foreseeable future. Payment of future dividends, if any, will be at the discretion of our board of directors after taking into account various factors, including our financial condition, operating results, current and anticipated cash needs and plans for expansion.

## DILUTION

Our net tangible book value as of June 30, 2017 was approximately $19.9 million, or $0.40 per Share. Net tangible book value per share is determined by dividing our total tangible assets, less total liabilities, by the number of shares of our common stock outstanding as of June 30, 2017. Dilution with respect to net tangible book value per share represents the difference between the amount per share paid by purchasers of our Shares in this offering and the net tangible book value per share of our Shares immediately after this offering.

After giving effect to the sale of 4,000,000 Shares in this offering at the offering price of $2.60 per Share, and after deducting placement agent fees for this offering, our as adjusted net tangible book value as of June 30, 2017, would have been approximately $29.8 million, or $0.56 per share. This represents an immediate increase in net tangible book value of $0.16 per Share to existing stockholders and immediate dilution in net tangible book value of $2.04 per Share to investors purchasing our Shares in this offering at the public offering price. The following table illustrates this dilution on a per Share basis:

| | | |
|---|---|---|
| Public offering price per Share | $ | 2.60 |
| Net tangible book value per Share of as June 30, 2017 | $ | 0.40 |
| Increase in net tangible book value per Share attributable to investors in this offering | | 0.16 |
| As adjusted net tangible book value per Share after this offering | | 0.56 |
| Dilution per Share to investors in this offering | | 2.04 |

The number of Shares to be outstanding after the offering is based on the number of Shares outstanding as of June 30, 2017. As of that date, we had 49,555,959 Shares outstanding, excluding:

- 6,865,212 Shares underlying options outstanding, at a weighted average exercise price of $3.36 per share;
- 593,500 Shares issuable upon vesting of restricted stock units;
- 2,813,159 Shares underlying warrants issued May 13, 2016 outstanding, at an exercise price of $4.37 per share, expiring May 13, 2021;
- 2,670,792 Shares available for future grant under our 2013 Equity Incentive Plan; and
- An indeterminate number of shares that the Company may issue from time to time, at its election in lieu of cash, during the term of the Company's services agreement with Cell Therapy Catapult Services Limited in consideration for services to be rendered having a value as of June 30, 2017 of up to GBP £1,300,000.

In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe that 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.

## PLAN OF DISTRIBUTION

Pursuant to a placement agency agreement between us and Chardan Capital Markets, LLC ("Chardan") we have engaged Chardan as our exclusive placement agent to solicit offers to purchase the shares in this offering. The placement agent is not purchasing or selling any of the shares we are offering, and it is not required to arrange the purchase or sale of any specific number of shares or dollar amount, but it has agreed to use commercially reasonable efforts to arrange for the sale of the shares. The placement agent may retain sub-agents and selected dealers in connection with this offering.

The placement agent proposes to arrange for the sale of the shares we are offering pursuant to this prospectus supplement to one or more investors through securities purchase agreements directly between the purchasers and us. All of the shares will be sold at the same price and, we expect, at a single closing. We established the price following negotiations with prospective investors and with reference to the prevailing market price of our common stock, recent trends in such price and other factors. It is possible that not all of the shares we are offering pursuant to this prospectus supplement will be sold at the closing, in which case our net proceeds would be reduced. We anticipate that the sale of the shares will be completed on the date indicated on the cover page of this prospectus supplement, subject to customary closing conditions. On the closing date, the following will occur:

- we will receive funds in the amount of the aggregate purchase price;
- Chardan, as placement agent, will receive the placement agent fees in accordance with the terms of the placement agency agreement; and
- we will deliver the shares to the investors.

In connection with this offering, the placement agent may distribute this prospectus supplement and the accompanying prospectus electronically.

We will pay the placement agent cash fees equal to six percent (6%) of the gross proceeds from the sale of the shares in this offering, other than any shares sold to certain investors referred by us, with respect to which we will pay the placement agent cash fees equal to three percent (3%), and have agreed to reimburse the placement agent for its expenses (including legal fees of its counsel) incurred in connection with the offering . The following table shows the per share and total placement agent fee we will pay to the placement agent in connection with the sale of the shares, assuming the purchase of all of the shares we are offering.

| | | |
|---|---|---|
| Per share | $ | $0.12[1] |
| Total | $ | 499,800[1] |

[1] Except for any shares sold to certain investors referred by us, with respect to which we will pay the placement agent cash fees equal to three percent (3%).

After deducting certain fees due to the placement agent and our estimated offering expenses, we expect the net proceeds from this offering to be approximately $9,900,200

We have agreed to indemnify the placement agent against certain liabilities, including liabilities under the Securities Act of 1933, as amended ("Securities Act"), and liabilities arising from breaches and representations and warranties by us as contained in the placement agency agreement. We have also agreed to contribute to payments the placement agent may be required to make in respect of such liabilities.

The placement agency agreement is included as an exhibit to our Current Report on Form 8-K that we will file with the SEC in connection with this offering.

Chardan 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 shares sold by it while acting as principal might be deemed to be underwriting discounts or commissions under the Securities Act. As an underwriter, Chardan would be required to comply with the requirements of the Securities Act and the Securities Exchange Act of 1934, as amended ("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 by Chardan acting as principal. Under these rules and regulations, Chardan:

- 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.

**Electronic Distribution**

A prospectus supplement in electronic format may be made available on websites or through other online services maintained by the placement agent of the offering, or by its affiliates. Other than the prospectus supplement in electronic format, the information on the placement agent's websites and any information contained in any other website maintained by the placement agent is not part of this prospectus supplement or the registration statement of which this prospectus supplement forms a part, has not been approved and/or endorsed by us or the placement agent in its capacity as placement agent and should not be relied upon by investors.

**Listing**

Our Series A common stock is listed on the NYSE American under the symbol "AST."

**Selling Restrictions**

No action has been taken in any jurisdiction (except in the United States) that would permit a public offering of our common stock, or the possession, circulation or distribution of this prospectus supplement, the accompanying prospectus or any other material relating to us or our common stock in any jurisdiction where action for that purpose is required. Accordingly, our common stock may not be offered or sold, directly or indirectly, and none of this prospectus supplement, the accompanying prospectus or any other offering material or advertisements in connection with our common stock may be distributed or published, in or from any country or jurisdiction, except in compliance with any applicable rules and regulations of any such country or jurisdiction.

The placement agent may arrange to sell common stock offered hereby in certain jurisdictions outside the United States, either directly or through affiliates, where they are permitted to do so.

**Affiliations**

The placement agent and its affiliates have provided, and may in the future provide, various investment banking, financial advisory and other financial services to us and our affiliates for which they have received, and in the future may receive, advisory or transaction fees, as applicable.

## LEGAL MATTERS

The validity of the issuance of the securities offered hereby will be passed upon by Dentons US LLP, New York, New York. Loeb & Loeb LLP has acted as counsel for the placement agent.

## EXPERTS

OUM & Co. LLP, our independent registered public accounting firm, has audited our financial statements included in our Annual Report on Form 10-K for the year ended December 31, 2016 and 2015, and the effectiveness of our internal control over financial reporting as of December 31, 2016 and 2015, as set forth in their reports, which are incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on OUM & Co. LLP's reports, given on their authority as experts in accounting and auditing.

## WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and periodic reports, proxy statements and other information with the Commission. You may read and copy any materials that we file with the Commission at the Commission's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. You may obtain information on the operation of the Public Reference Room by calling the Commission at 1-800-SEC-0330. Many of our Commission filings are also available to the public from the Commission's website at http://www.sec.gov. We make available free of charge our annual, quarterly and current reports, proxy statements and other information upon request. To request such materials, please send an e-mail to InvestorRelations@asteriasbio.com or contact Investor Relations, at the following address or telephone number: Asterias Biotherapeutics, Inc., 6300 Dumbarton Circle, Fremont, California 94555, Attention: Investor Relations; (510) 456-3800. Exhibits to the documents will not be sent, unless those exhibits have specifically been incorporated by reference in this prospectus.

We maintain our corporate website at http://www.asteriasbiotherapeutics.com. Our website and the information contained therein or connected thereto is not incorporated into this Registration Statement.

We have filed with the Commission a registration statement on Form S-3 under the Securities Act relating to the securities we are offering by this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules to the registration statement. Please refer to the registration statement and its exhibits and schedules for further information with respect to us and our securities. Statements contained in this prospectus as to the contents of any contract or other document are not necessarily complete and, in each instance, we refer you to the copy of that contract or document filed as an exhibit to the registration statement. You may read and obtain a copy of the registration statement and its exhibits and schedules from the Commission, as described in the preceding paragraph.

## INCORPORATION BY REFERENCE

The Commission allows us to "incorporate by reference" the information we file with them, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus supplement, and information that we file later with the Commission will automatically update and supersede this information. We incorporate by reference the documents filed with Commission listed below:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2016, filed on March 28, 2017;
- our Quarterly Reports on Form 10-Q for the quarter ended March 31, 2017 and June 30, 2017, filed on May 11, 2017 and August 14, 2017, respectively;
- our Current Reports on Form 8-K filed with the Commission on May 23, 2017, June 16, 2017, August 17, 2017; September 26, 2017 and October 16, 2017;
- the information contained in our definitive proxy statement on Schedule 14A for our 2017 annual meeting of stockholders, filed with the SEC on May 1, 2017, as supplemented on May 23, 2017; and
- the description of our Shares contained in our Registration Statement on Form 8-A filed with the Commission on September 6, 2014.

All reports and other documents subsequently filed by us with the Commission pursuant to Sections 13(a), 13(c), 14, or 15(d) of the Securities Exchange Act of 1934 after the date of this prospectus and before the termination of the offering shall be deemed to be incorporated by reference in this prospectus and to be a part of this prospectus from the date of filing of such reports and documents. This prospectus also incorporates by reference any documents that we file with the Commission after the date that the initial registration statement is filed with the Commission and before the effectiveness of the registration statement. Any statement contained in any document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or in any other subsequently filed document which also is or is deemed to be incorporated by reference in this prospectus modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

You may request a copy of these filings, at no cost, by sending an e-mail to InvestorRelations@asteriasbio.com and requesting any one or more of such filings or by contacting Investor Relations, at the following address or telephone number: Asterias Biotherapeutics, Inc., 6300 Dumbarton Circle, Fremont, CA 94555, Attention: Investor Relations; (510) 456-3800. Exhibits to the documents will not be sent, unless those exhibits have specifically been incorporated by reference in this prospectus.

Table of Contents

# PROSPECTUS

## $75,000,000

**Asterias Biotherapeutics, Inc.**

**Preferred Stock**
**Series A Common Stock**
**Warrants**

---

From time to time, we may offer and sell preferred stock, common stock or warrants or any combination of those securities, either individually or in units, in one or more offerings. The aggregate public offering price of the securities offered by us pursuant to this prospectus will not exceed $75,000,000.00.

This prospectus provides you with a general description of the securities that we may offer. Each time we offer securities, we will provide a prospectus supplement that will contain more specific information about the terms of that offering, including the prices at which those securities will be sold. We may also add, update or change in the prospectus supplement any of the information contained in this prospectus. You should carefully read this prospectus, together with any prospectus supplements and information incorporated by reference in this prospectus and any prospectus supplements, before you decide to invest. **This prospectus may not be used to offer or sell any securities unless accompanied by a prospectus supplement.**

The securities offered by us pursuant to this prospectus may be sold directly to investors, through agents, underwriters or dealers as designated from time to time, through a combination of these methods or in any other manner as described under the heading "Plan of Distribution" and in the corresponding section in the applicable prospectus supplement. Each time we offer securities, the relevant prospectus supplement will provide the specific terms of the plan of distribution for such offering and the net proceeds that we expect to receive from such offering.

Shares of our Series A Common Stock (the "Common Stock") are listed on the NYSE MKT LLC under the trading symbol "AST." Any securities sold pursuant to this prospectus and any prospectus supplement may be listed on that exchange, subject to official notice of issuance. Each prospectus supplement to this prospectus will contain information, where applicable, as to any other listing of the securities covered by the prospectus supplement on any national securities exchange.

Investing in our securities involves significant risks. See "Risk Factors" beginning on page 6.

Neither the U.S. Securities and Exchange Commission (the "Commission") nor any state securities commission has approved or disapproved of these securities or determined if this prospectus is truthful or complete. Any representation to the contrary is a criminal offense.

The date of this prospectus is January 13, 2017.

**TABLE OF CONTENTS**

## ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Commission utilizing a "shelf" registration process or continuous offering process, which allows us to offer and sell any combination of the securities described in this prospectus in one or more offerings. You should rely only on the information we have provided or incorporated by reference in this prospectus or any prospectus supplement. We have not authorized anyone to provide you with additional or different information. We are not making an offer of these securities in any state or other jurisdiction where the offer is not permitted. You should not assume that the information in this prospectus is accurate as of any date other than the date on the front of the prospectus. Using this prospectus, we may offer up to a total dollar amount of $75,000,000 of these securities.

This prospectus provides you with a general description of the securities we may offer. Each time we sell securities pursuant to the registration statement of which this prospectus is a part, we will provide a prospectus supplement that will contain specific information about the terms of that offering. That prospectus supplement may include additional risk factors about us and the terms of that particular offering. Prospectus supplements may also add to, update or change the information contained in this prospectus. To the extent that any statement that we make in a prospectus supplement is inconsistent with statements made in this prospectus, the statements made in this prospectus will be deemed modified or superseded by those made in such prospectus supplement. In addition, as we describe in the section entitled "Where You Can Find More Information," we have filed and plan to continue to file other documents with the Commission that contain information about us and the business conducted by us. Before you decide whether to invest in any of these securities, you should read this prospectus, the prospectus supplement that further describes the offering of these securities and the information we file with the Commission.

In this prospectus and any prospectus supplement, unless otherwise indicated, the terms "Asterias," the "Company," "we," "us" and "our" refer and relate to Asterias Biotherapeutics, Inc.

## SPECIAL NOTE REGARDING FORWARD-LOOKING INFORMATION

This prospectus and the documents incorporated by reference herein contains "forward-looking statements" within the meaning of Section 27A of the Securities Act and Section 21E of the Securities Exchange Act of 1934. The forward-looking statements are only predictions and provide our current expectations or forecasts of future events and financial performance and may be identified by the use of forward-looking terminology, including such terms as "believes," "estimates," "anticipates," "expects," "plans," "intends," "may," "will" or "should" or, in each case, their negative, or other variations or comparable terminology, though the absence of these words does not necessarily mean that a statement is not forward-looking. Forward-looking statements include all matters that are not historical facts and include, without limitation, statements concerning: our business strategy, outlook, objectives, future milestones, plans, intentions, goals, and future financial condition, including the period of time during which our existing resources will enable us to fund our operations. Forward-looking statements also include our financial, clinical, development and potential regulatory plans to secure marketing authorization for our products under development, starting with AST-OPC1, AST-VAC1 and AST-VAC2, if approved and our expectations, timing and anticipated outcomes of submitting regulatory filings for our products under development.

We intend that all forward-looking statements be subject to the safe-harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are subject to many risks and uncertainties that could cause actual results to differ materially from any future results expressed or implied by the forward-looking statements. We caution you therefore against relying on any of these forward-looking statements. They are neither statements of historical fact nor guarantees or assurances of future performance. Examples of the risks and uncertainties include, but are not limited to:

- We will require in the near term, but may be unable to secure, significant additional capital to continue our operations, and support our research and development activities;
- We will need to issue additional equity or debt securities in order to raise additional capital needed to pay our operating expenses;
- We will spend a substantial amount of our capital on research and development but we might not succeed in developing products and technologies that are useful in medicine;
- Risks relating to the progress of our clinical trials, including our ability to obtain FDA approval;
- We are subject to government regulation;
- Risks relating to intellectual property rights, such as our ability to obtain or enforce patents, the possibility that we may be subject to patent infringement claims, or the possibility that we may lose our rights to key technologies on which our business depends;
- We have no experience in manufacturing, marketing, selling or distributing products and may depend on third parties to develop and commercialize many of our product candidates and to provide the manufacturing, regulatory compliance, sales, marketing and distribution capabilities required for the success of our business;
- Failure of our internal control over financial reporting could harm our business and financial results; and
- BioTime is our largest shareholder and BioTime has substantial influence on our business and operations.

Pharmaceutical, biotechnology and medical technology companies have suffered significant setbacks conducting clinical trials, even after obtaining promising earlier preclinical and clinical data. Moreover, data obtained from clinical trials are susceptible to varying interpretations, which could delay, limit or prevent regulatory approval. After gaining approval of a drug product, pharmaceutical and biotechnology companies face considerable challenges in marketing and distributing their products, and may never become profitable.

The forward-looking statements contained in this prospectus or the documents incorporated by reference herein speak only as of their respective dates. Factors or events that could cause our actual results to differ may emerge from time to time and it is not possible for us to predict them all. Except to the extent required by applicable laws, rules or regulations, we do not undertake any obligation to publicly update any forward-looking statements or to publicly announce revisions to any of the forward-looking statements, whether as a result of new information, future events or otherwise.

## PROSPECTUS SUMMARY

*This summary highlights certain information about us and information appearing elsewhere in this prospectus and in the documents we incorporate by reference. This summary is not complete and does not contain all of the information that you should consider before investing in our securities. The following summary is qualified in its entirety by, and should be read in conjunction with, the more detailed information appearing elsewhere in this prospectus and the financial statements and notes thereto appearing in our Annual and Quarterly Reports, which are incorporated herein by reference. Before you decide to invest in our securities, to fully understand this offering and its consequences to you, you should carefully read this entire prospectus carefully, including the matters set forth under the caption "Risk Factors," any accompanying prospectus supplement and the other documents incorporated by reference herein and therein.*

### Business Overview

We are a clinical-stage biotechnology company focused on developing and commercializing novel therapies in the emerging fields of cell therapy and regenerative medicine. We have two core technology platforms. The first is our pluripotent stem cell platform. Pluripotent cells are a type of stem cell capable of becoming all of the cell types in the human body. The second is an immunotherapy platform to teach cancer patients' immune systems to attack their tumors. We are focused on developing therapies to treat conditions with high unmet medical needs and inadequate available therapies, with an initial focus on the therapeutic areas of neurology and oncology.

### Products Under Development


### Product Candidates

***AST-OPC1 Oligodendrocyte Progenitor Cells***

Our AST-OPC1 product candidate for treatment of spinal cord injuries is comprised of oligodendrocyte progenitor cells, which are cells that become oligodendrocytes after injection, derived from a cGMP master cell bank of undifferentiated hES cells that has been fully qualified for human use. These cells, which are stored frozen until ready for use, are produced under cGMP conditions and screened for adventitious agents.

*Phase I Safety Trial*

As of December 2016, all five subjects in our phase I safety trial of our AST-OPC1 in thoracic spinal cord injury ("SCI") have completed five years of follow up under the protocol. No surgical complications during or post-surgery have been observed, and there have been no significant adverse events to date in any patient attributable to the AST-OPC1 product, the surgery to deliver the cells, or the immunosuppressive regimen. There have been no unexpected neurological changes to date, nor has there been evidence of adverse changes or cavitation on multiple MRIs. MRI results in four of the five subjects are consistent with prevention of lesion cavity formation. Immune monitoring, conducted in some of the subjects, has not detected any evidence of immune responses to AST-OPC1 at time periods of up to one year post-transplant.

*Phase 1/2a Dose Escalation Study: Subjects with Neurologically Complete Cervical Spinal Cord Injuries*

We initiated enrollment of the SCiStar Phase 1/2a dose escalation trial of AST-OPC1 in subjects with neurologically complete (American Spinal Injury Association Impairment Scale A; AIS-A) cervical injuries in March 2015. In May 2016, we announced that the FDA had approved expansion of the study to include up to 35 subjects, including the addition of two cohorts of 5-8 subjects with motor complete, sensory incomplete AIS-B injuries. The trial is designed to assess safety and activity of three escalating doses of AST-OPC1 in motor complete cervical SCI, the first targeted indication for AST-OPC1. The trial is an open-label, single-arm study in subjects with sub-acute, C-5 to C-7, motor complete (AIS-A and AIS-B) cervical SCI. AST-OPC1 is administered 14 to 30 days post-injury. Subjects are followed by neurological exams and imaging methods to assess the safety and activity of the product. We completed enrollment in the first (AIS-A; two million cells) dose cohort in August 2015, and of the second (AIS-A; ten million cells) dose cohort in July 2016. We are currently open for concurrent enrollment in the third (AIS-A; 20 million cells) and fourth (AIS-B; 10 million cells) cohorts. No serious adverse events related to AST-OPC1, the administration procedure, or the immunosuppressive regimen have been observed to date. . In September 2016, we announced early but promising interim efficacy data from the study and we intend to provide our next interim update in January 2017.

We received a Strategic Partnerships Award grant from the California Institute for Regenerative Medicine, which provides for up to $14.3 million of non-dilutive funding for the Phase 1/2a clinical trial and other product development activities for AST-OPC1, subject to achieving certain milestones. As of December 1, 2016, $10.3 million of payments have been received by Asterias, $2.5 million is payable to Asterias based on recent milestone achievement, and $1.5 million remains payable upon achievement of future milestones. Additionally, in February 2016, we announced that the FDA had granted our application for Orphan Drug Designation of AST-OPC1 for the treatment of acute spinal cord injury.

***AST-VAC1 and AST-VAC2, Cancer Vaccine Candidates Targeting Telomerase***

We are developing two experimental immunotherapeutic programs, AST-VAC1 and AST-VAC2, each designed to attack cancer cells by targeting the cancer cell's expression of telomerase. Both product candidates use an immune cell type known as dendritic cells to stimulate immune responses to telomerase. Dendritic cells are antigen processing and presenting cells which are potent initiators of a cellular and antibody-mediated immune response Telomerase is a ubiquitous cancer antigen, expressed at high levels in nearly all human cancers, but at very low levels or not at all in normal human cells. The premise underlying these vaccines is to "teach" the patient's own immune system to attack cancer cells while sparing other normal healthy cells.

*AST-VAC1: Autologous Telomerase-loaded, Dendritic Cells*

AST-VAC1 is an autologous product candidate, or a product that is derived from cells that come from the treated patient. AST-VAC1 consists of mature antigen-presenting dendritic cells pulsed with RNA for the protein component of human telomerase ("hTERT") and a portion of a lysosomal targeting signal ("LAMP"). LAMP directs the telomerase RNA to the lysosome, the subcellular organelle that directs the RNA to a particular part of the cell membrane. AST-VAC1 is injected into the patient's skin, with the objective of the dendritic cells traveling to the lymph nodes and instructing cytotoxic T-cells to kill tumor cells that express telomerase on their surface.

*AST-VAC2: hES Cell-Derived Allogeneic Dendritic Cells*

AST-VAC2 is an allogeneic, or non-patient specific, cancer vaccine candidate designed to stimulate patient immune responses to telomerase. AST-VAC2 is produced from hES cells and can be modified with any antigen. We believe that the use of hES, as opposed to collecting and using the patient's own blood, as the starting material for AST-VAC2 provides a scalable system for the production of a large number of vaccine doses in a single lot. Allogeneic vaccine production has the potential to lower manufacturing costs, "off-the-shelf" availability and broader patient availability, and ensure product consistency. In addition, we believe that this approach has the potential to stimulate a more robust immune response through an adjuvant effect of the immune mismatch between the genetic makeup of AST-VAC2 and patients. Further, we believe AST-VAC2 may be synergistic with immune checkpoint inhibitors currently in development for many cancer indications because immune checkpoint inhibitors function by relieving suppressive mechanisms exerted on T-cells by the tumor, whereas AST-VAC2 is designed to specifically target the T-cells to attack the telomerase expressing tumor cells.

*Product Development Strategy for AST-VAC2*

During September 2014, we entered into a Clinical Trial and Option Agreement with Cancer Research UK ("CRUK") and Cancer Research Technology Limited, ("CRT"), a wholly-owned subsidiary of CRUK (the "CRUK Agreement"). In January 2016 we announced that we had completed the technology transfer of the AST-VAC2 manufacturing process to CRUK. CRUK is now producing AST-VAC2 in its facility under current good manufacturing practice ("cGMP"). Cancer Research UK's Centre for Drug Development ("CDD") intends to submit a Clinical Trial Authorization application to the UK regulatory authorities for the Phase 1/2 clinical trial in non-small cell lung cancer in Q1 2017. This trial will be sponsored, managed and funded by CDD. The clinical trial will examine the safety, immunogenicity and activity of AST-VAC2 and position the immunotherapy to be tested for numerous clinical indications. We will continue to serve in a collaborative and advisory role with CRUK throughout this process.

Upon completion of the Phase 1/2 study, we will have an exclusive first option to acquire the data generated in the trial. If we exercise that option we will be obligated to make payments upon the execution of the license agreement, upon the achievement of various milestones, and then royalties on sales of products. In connection with the CRUK Agreement, we sublicensed to CRUK certain patents that have been licensed or sublicensed to us by third parties for use in the clinical trials and product manufacturing process. We would also be obligated to make payments to those patent licensors and sublicensors upon the achievement of various milestones, and then royalties on sales of products if AST-VAC2 is successfully developed and commercialized.

**Corporate Information**

We are a Delaware corporation. Our corporate headquarters are located at 6300 Dumbarton Circle Fremont, California 94555 and our telephone number is (510) 456-3800. We maintain a website at http://www.asteriasbiotherapeutics.com. Information contained on or linked to our website is not a part of this prospectus supplement summary. Our Series A Common Stock is listed on The NYSE MKT, under the symbol "AST."

**Trademark Notice**

Asterias Biotherapeutics, the Asterias Biotherapeutics logo and other trademarks of Asterias Biotherapeutics appearing in this prospectus are the property of Asterias Biotherapeutics. All other trademarks, service marks and trade names in this prospectus are the property of their respective owners. We have omitted the ® and ™ designations, as applicable, for the trademarks used in this prospectus.

**Ratio of Earnings to Combined Fixed Charges and Preferred Stock Dividends**

If we offer preference equity securities under this prospectus, then we will, if required at that time, provide a ratio of combined fixed charges and preference dividends to earnings in the applicable prospectus supplement for such offering.

## RISK FACTORS

*An investment in our securities involves significant risks. You should carefully consider the risks described below or in any applicable prospectus supplement and other information, including our financial statements and related notes previously included in our periodic reports, filed with the Commission, and in the documents incorporated therein by reference before deciding to invest in our securities. However, those risks are not the only ones that we face. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations. The following risks, among others, could cause our actual results, performance, achievements or industry results to differ materially from those expressed in our forward-looking statements contained herein and presented elsewhere by management from time to time. If any of the following risks actually occurs, our business prospects, financial condition or results of operations could be materially harmed. In such case, the market price of our securities would likely decline and you could lose all or part of your investment.*

### Risks Related to Our Business

**We have a history of operating losses and negative cash flows.**

Since our inception in September 2012, we have incurred operating losses and negative cash flow, and we expect to continue to incur losses and negative cash flow in the future. Our net losses for the fiscal years ended December 31, 2015, 2014, and 2013 were $15.0 million, $10.1 million, and $22.4 million respectively, and we had an accumulated deficit of $48.2 million and $33.2 million as of December 31, 2015 and 2014, respectively. For the nine months ended September 30, 2016, we had net losses of $26.1 million and an accumulated deficit of $74.4 million. Our net loss for the year ended December 31, 2013 and our accumulated deficit as of that date include $17.5 million charged as in-process research and development expenses ("IPR&D") in accordance with Accounting Standards Codification ("ASC") 805-50 on account of our acquisition of certain assets from Geron. See Notes 2 and 3 to the Financial Statements. BioTime previously funded our formation and operating costs but we do not expect BioTime to continue to do so in the future. We have limited cash resources and will depend upon future equity financings, research grants, financings through collaborations with third parties, and sales of BioTime common shares that we have as a source of funding for our operations. There is no assurance that we will be able to obtain the financing we need from any of those sources, or that any such financing that may become available will be on terms that are favorable to us and our shareholders.

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

Under Section 382 of the Internal Revenue Code of 1986, as amended, if a corporation undergoes an "ownership change," generally defined as a greater than 50% change (by value) in its equity ownership over a three year period, the corporation's ability to use its pre-change net operating loss carryforwards and other pre-change tax attributes (such as research tax credits) to offset its post-change income may be limited. Since the Company's formation, the Company has raised capital through the issuance of capital stock on several occasions which, combined with disposition of shares by shareholders, may have resulted in one or more changes of control, as defined by Section 382. If the Company has experienced such a change of control, its NOL carryforwards and tax credits may not be available, or their utilization could be subject to an annual limitation under Section 382. In addition, since we will need to raise substantial additional funding to finance our operations, we may undergo further ownership changes in the future. If we have net taxable income, our ability to use our pre-change net operating loss carryforwards to offset United States federal taxable income may be subject to limitations, which could potentially result in increased future tax liability to us. Similar rules and limitations may apply for state income tax purposes.

**Failure to attract and retain skilled personnel and key relationships could impair our research and development efforts.**

Some of our operations are still in the start-up stage and we had only 55 employees as of December 1, 2016. We will need to recruit and hire additional qualified research scientists, laboratory technicians, clinical development, and management personnel. Competition for these types of personnel is intense and we may experience delays in hiring the qualified people that we need. The inability to attract and retain sufficient qualified management, scientific, or technical personnel may significantly delay or prevent the achievement of our product development and other business objectives and could have a material adverse effect on our business, operating results and financial condition. We partially rely on BioTime to provide certain services related to financial accounting management and reporting. We will also rely on consultants and advisors who are either self-employed or employed by other organizations, and they may have conflicts of interest or other commitments, such as consulting or advisory contracts with other organizations, that may affect their ability to perform services for us.

**We will spend a substantial amount of our capital on research and development but we might not succeed in developing products and technologies that are useful in medicine.**

The product development work we plan to do is costly, time consuming and uncertain as to its results. We will attempt to develop new medical products and technologies that might not prove to be safe and efficacious in human medical applications. Many of the products and technologies that we will seek to develop have not been applied in human medicine and have only been used in laboratory studies in vitro or in animals. Only two of the product candidates that we have acquired have been used in clinical trials, and those were early stage trials involving only a small number of subjects. If we are successful in developing a new technology or product, refinement of the new technology or product and definition of the practical applications and limitations of the technology or product may take years and require the expenditure of large sums of money.

**The amount and pace of research and development work that we can do or sponsor, and our ability to commence and complete clinical trials required to obtain FDA and foreign regulatory approval of our products, depends upon the amount of money available to us.**

We may have to limit our laboratory research and development work based on the amount of our cash resources. We plan to continue to seek research and development grants from government agencies and to enter into collaborative product development agreements through which third parties will provide funding or otherwise bear the cost of research and development or clinical trials of our product candidates. There is no assurance that the amount of any grants that we may receive will be adequate for our needs. The agreements we entered into to date with CIRM and CRUK are subject to termination if certain milestones are not achieved. Hence, there is no assurance that we will receive the full value of the agreement with either entity. Unless we are able to generate sufficient revenue or raise additional funds when needed, it is likely that we will be unable to continue our planned activities, even if we make progress in our research and development projects.

**We will need to issue additional equity or debt securities in order to raise additional capital needed to pay our operating expenses.**

We plan to incur substantial research and product development expenses, and we will need to raise additional capital to pay operating expenses until we are able to generate sufficient revenues from product sales, royalties, and license fees. It is likely that additional sales of equity or debt securities will be required in the near future to meet our short-term capital needs, unless we receive substantial research grants and revenues from the sale of any products that receive regulatory approval or we are successful in licensing or sublicensing our technology and we receive substantial licensing fees and royalties. Sales of additional equity securities could result in the dilution of the interests of present shareholders.

**The condition of certain cells, cell lines and other biological materials that we acquired from Geron could impact the time and cost of commencing our research and product development programs.**

The cells, cell lines and other biological materials that we acquired are being stored under cryopreservation protocols intended to preserve their functionality. We have successfully completed the verification of the viability of three lots of AST-OPC1 cells that we intend to use in clinical trials. However, the functional condition of the other materials cannot be certified until they are tested in an appropriate laboratory setting by qualified scientific personnel using validated equipment. We intend to perform that testing on the cells that we intend to use in our research and development programs as the need arises.

To the extent that the cells we plan to use are not sufficiently functional for our purposes, we would need to incur the time and expense of regenerating cell lines from cell banks, or regenerating cell banks from cell stocks, which could delay and increase the cost of our research and development work using those cells.

**Sales of any products we may develop may be adversely impacted by the availability of competing products.**

In order to compete with other products, particularly those that sell at lower prices, our products will have to provide medically significant advantages. Physicians and hospitals may be reluctant to try a new product due to the high degree of risk associated with the application of new technologies and products in the field of human medicine. There also is a risk that our competitors may succeed at developing safer or more effective products that could render our products and technologies obsolete or noncompetitive.

**Any products that receive regulatory approval may be difficult and expensive to manufacture on a commercial scale.**

hES derived therapeutic cells have only been produced on a small scale and not in quantities and at levels of purity and viability that will be needed for wide scale commercialization. If we are successful in developing products that consist of hES cells or other cells or products derived from hES or other cells, we will need to develop, alone or in collaboration with one or more pharmaceutical companies or contract manufacturers, technology for the commercial production of those products. Our hES cell or other cell-based products are likely to be more expensive to manufacture on a commercial scale than most other drugs on the market today. The high cost of manufacturing a product will require that we charge our customers a high price for the product in order to cover our costs and earn a profit. If the price of our products is too high, hospitals and physicians may be reluctant to purchase our products, especially if lower priced alternative products are available, and we may not be able to sell our products in sufficient volumes to recover our costs of development and manufacture or to earn a profit.

**We do not have our own marketing, distribution, and sales resources for the commercialization of any products that we might successfully develop.**

If we are successful in developing marketable products, we will need to build our own marketing, distribution, and sales capability for our products, which would require the investment of significant financial and management resources, or we will need to find collaborative marketing partners, independent sales representatives, or wholesale distributors for the commercial sale of our products. If we market products through arrangements with third parties, we may pay sales commissions to sales representatives or we may sell or consign products to distributors at wholesale prices. As a result, our gross profit from product sales may be lower than it would be if we were to sell our products directly to end users at retail prices through our own sales force. There can be no assurance that we will able to negotiate distribution or sales agreements with third parties on favorable terms to justify our investment in our products or achieve sufficient revenues to support our operations.

**We do not have the ability to independently conduct clinical trials required to obtain regulatory approvals for our therapeutic product candidates.**

We will need to rely on third parties, such as CRUK, contract research organizations, data management companies, contract clinical research associates, medical institutions, clinical investigators and contract laboratories to conduct any clinical trials that we may undertake for our products. We may also rely on third parties to assist with our preclinical development of therapeutic product candidates. If we outsource clinical trials, we may be unable to directly control the timing, conduct and expense of our clinical trials. If we enlist third parties to conduct clinical trials and they fail to successfully carry out their contractual duties or regulatory obligations or fail to meet expected deadlines, if the third parties need to be replaced or if the quality or accuracy of the data they obtain is compromised due to the failure to adhere to clinical protocols or regulatory requirements or for other reasons, our preclinical development activities or clinical trials may be extended, delayed, suspended or terminated, and we may not be able to obtain regulatory approval for or successfully commercialize our therapeutic product candidates.

**We will have certain obligations and may incur liabilities arising from clinical trials, and we do not yet know the scope of any resulting expenses that might arise.**

We face the risk of incurring liabilities to subjects who participate in clinical trials of our product candidates if they incur any injuries as a result of their participation. We will also be obligated to obtain information and prepare reports about the health of the clinical trial subjects. In addition, we have assumed Geron's obligations to obtain information and prepare reports about the health of subjects, and we have assumed any liabilities to those subjects that might arise from any injuries they may have incurred, as a result of their participation in the clinical trials of Geron's GRN-OPC1 cell replacement therapy for spinal cord damage and its GRN-VAC1 immunological therapy for certain cancers. We are not aware of any claims by subjects alleging injuries suffered as a result of any of those clinical trials, but if any claims are made and if liability can be established, the amount of any liability that we may incur, depending upon the nature and extent of any provable injuries, could exceed our insurance coverage, and the amount of the liability could be material to our financial condition.

**Our business could be adversely affected if we lose the services of the key personnel upon whom we depend.**

Our research programs are directed primarily by our President of Research and Development, Dr. Jane S. Lebkowski, our Chief Operating Officer, Dr. Katharine E. Spink, and our Chief Medical Officer, Dr. Edward D. Wirth. In addition, our success depends to a large extent on our President and CEO, Stephen L. Cartt, and our Chief Financial Officer and General Counsel, Ryan D. Chavez. If any of these key personnel should leave our employ we may be unable to locate and recruit sufficient replacement personnel without undue delay or additional cost or we may be unable to replace them at all. Any such delay or inability could delay or terminate some or all of our research programs, the commercialization of our products, or our ability to raise capital to fund our business. Even if we are able to attract suitable replacement personnel, we may incur delays during a transition period. Therefore, the loss of these key employees could have a material adverse effect on us.

**Our business and operations could suffer in the event of system failures**

Despite the implementation of security measures, our internal computer systems and those of our contractors and consultants are vulnerable to damage from computer viruses, unauthorized access, natural disasters, terrorism, war and telecommunication and electrical failures. Such events could cause interruption of our operations. For example, the loss of data for our product candidates could result in delays in our regulatory filings and development efforts and significantly increase our costs. To the extent that any disruption or security breach was to result in a loss of or damage to our data, or inappropriate disclosure of confidential or proprietary information, we could incur liability and the development of our product candidates could be delayed.

**Failure of our internal control over financial reporting could harm our business and financial results.**

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting for external purposes in accordance with accounting principles generally accepted in the U.S. Internal control over financial reporting includes maintaining records that in reasonable detail accurately and fairly reflect our transactions; providing reasonable assurance that transactions are recorded as necessary for preparation of our financial statements; providing reasonable assurance that receipts and expenditures of our assets are made in accordance with management authorization; and providing reasonable assurance that unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements would be prevented or detected on a timely basis. Because of its inherent limitations, internal control over financial reporting is not intended to provide absolute assurance that a misstatement of our financial statements would be prevented or detected. Our growth and entry into new products, technologies and markets will place significant additional pressure on our system of internal control over financial reporting. Any failure to maintain an effective system of internal control over financial reporting could limit our ability to report our financial results accurately and timely or to detect and prevent fraud.

We continue to rely in part on financial systems maintained by BioTime and upon services provided by BioTime personnel. BioTime allocates certain expenses among itself, us, and BioTime's other subsidiaries, which creates a risk that the allocations may not accurately reflect the benefit of an expenditure or use of financial or other resources by us, BioTime as our parent company, and the BioTime subsidiaries among which the allocations are made.

## Risks Related to Our Industry

We will face certain risks arising from regulatory, legal, and economic factors that affect our business and the business of other pharmaceutical and biological product development companies. Because we are a small company with limited revenues and limited capital resources, we may be less able to bear the financial impact of these risks than larger companies that have substantial income and available capital.

**If we do not receive FDA and other regulatory approvals we will not be permitted to sell our products.**

The cell-based products that we are developing cannot be sold until the FDA and corresponding foreign regulatory authorities approve the products for medical use. To date, long-term safety and efficacy has not been demonstrated in clinical trials for any of our therapeutic product candidates. The need to obtain regulatory approval to market a new product means that:

- we will have to conduct expensive and time consuming clinical trials of new products. The full cost of conducting and completing clinical trials necessary to obtain FDA and foreign regulatory approval of a new product cannot be presently determined, but could exceed our current financial resources;
- clinical trials and the regulatory approval process for a cell-based product can take several years to complete. As a result, we will incur the expense and delay inherent in seeking FDA and foreign regulatory approval of new products, even if the results of clinical trials are favorable;
- data obtained from preclinical and clinical studies is susceptible to varying interpretations that could delay, limit, or prevent regulatory agency approvals. Delays in the regulatory approval process or rejections of an application for approval of a new drug or cell-based product may be encountered as a result of changes in regulatory agency policy;
- because the therapeutic products we plan to develop with hES technology involve the application of new technologies and approaches to medicine, the FDA or foreign regulatory agencies may subject those products to additional or more stringent review than drugs or biologics derived from other technologies. No therapeutic product based on hES technology has been approved by the FDA to date.
- a product that is approved may be subject to restrictions on use;
- the FDA can limit or withdraw approval of a product if problems arise; and
- we will face similar regulatory issues in foreign countries.

**Clinical trial failures can occur at any stage of the testing and we may experience numerous unforeseen events during, or as a result of, the clinical trial process that could delay or prevent commercialization of our current or future therapeutic product candidates.**

All of our product candidates are either at early stages of clinical development or at the preclinical or research stages of development. Clinical trial failures or delays can occur at any stage of the trials, and may be directly or indirectly caused by a variety of factors, including but not limited to:

- delays in securing clinical investigators or trial sites for our clinical trials;
- delays in obtaining Institutional Review Board ("IRB") and other regulatory approvals to commence a clinical trial;
- slower than anticipated rates of patient recruitment and enrollment, or failing to reach the targeted number of subjects due to competition for subjects from other trials;
- limited or no availability of coverage, reimbursement and adequate payment from health maintenance organizations and other third party payors for the use of agents used in our clinical trials;
- negative or inconclusive results from clinical trials;
- unforeseen side effects interrupting, delaying, or halting clinical trials of our therapeutic product candidates, and possibly resulting in the FDA or other regulatory authorities denying approval of our therapeutic product candidates;
- unforeseen safety issues;
- uncertain dosing issues;
- approval and introduction of new therapies or changes in standards of practice or regulatory guidance that render our clinical trial endpoints or the targeting of our proposed indications obsolete;
- inability to monitor subjects adequately during or after treatment or problems with investigator or patient compliance with the trial protocols;
- inability to replicate in large controlled studies safety and efficacy data obtained from a limited number of subjects in uncontrolled trials;
- inability or unwillingness of medical investigators to follow our clinical protocols; and
- unavailability of clinical trial supplies.

**Government imposed bans or restrictions, and religious, moral and ethical concerns on the use of hES cells could prevent us from developing and successfully marketing stem cell products.**

Government imposed bans or restrictions on the use of embryos or hES cells research and development in the United States and abroad could generally constrain stem cell research, thereby limiting the market and demand for any of our products that receive regulatory approval. In March 2009, President Barack Obama lifted certain restrictions on federal funding of research involving the use of hES cells, and in accordance with President Obama's executive order, the National Institutes of Health has adopted new guidelines for determining the eligibility of hES cell lines for use in federally funded research. The central focus of the proposed guidelines is to assure that hES cells used in federally funded research were derived from human embryos that were created for reproductive purposes, were no longer needed for this purpose, and were voluntarily donated for research purposes with the informed written consent of the donors. hES cells that were derived from embryos created for research purposes rather than reproductive purposes, and other hES cells that were not derived in compliance with the guidelines, are not eligible for use in federally funded research.

In May 2016, the Select Investigative Panel on Infant Lives of the United States House of Representatives Committee on Energy and Commerce (the "Panel") submitted a formal request that we provide certain information relating to, among other things, whether we have used fetal tissue in our research. We fully complied with this request and have provided evidence, to the Panel's full satisfaction, that we have never used fetal tissue in our research, as we only use specific hES cell lines that were deemed eligible for federal funding based on their original derivation by third parties according to ethical principles. Then President George W. Bush in August 2001 signed an executive order approving, for research purposes, the use of these specific cell lines, among certain others, and approval for their use was subsequently reconfirmed under President Obama's March 2009 executive order.

California law requires that stem cell research be conducted under the oversight of a stem cell research oversight ("SCRO") committee. Many kinds of stem cell research, including the derivation of new hES cell lines, may only be conducted in California with the prior written approval of the SCRO. A SCRO could prohibit or impose restrictions on the research we plan to do.

The use of hES cells gives rise to religious, moral and ethical issues regarding the appropriate means of obtaining the cells and the appropriate use and disposal of the cells. These considerations could lead to more restrictive government regulations or could generally constrain stem cell research thereby limiting the market and demand for any of our products that receive regulatory approval. From time to time, social views on religious, moral and ethical issues could change that could affect political viewpoints and government regulations. Therefore, it is difficult to forecast with certainty whether there will be additional government imposed bans or restrictions, and religious, moral and ethical concerns on our use of hES cells that could potentially give rise to proceedings, litigation or disputes that could cause us to incur substantial expense, require significant time and attention from our management and result in civil penalties against us. The results of any such proceedings, litigation or disputes could have a material adverse effect on our business and results of operations. Furthermore, it is possible that such proceedings, litigation or disputes could negatively impact the ability of our vendors, suppliers or collaborators to conduct their operations, which could also have a material adverse effect on our business and results of operations.

## Risks Related to Our Intellectual Property

**If our efforts to protect our proprietary technologies are not adequate, we may not be able to compete effectively in our market.**

We rely upon a combination of patents, trade secret protection and contractual arrangements to protect the intellectual property related to our technologies. We will only be able to protect our products and proprietary information and technology by preventing unauthorized use by third parties to the extent that our patents, trade secrets, and contractual position allow us to do so. Any disclosure to or misappropriation by third parties of our trade secrets or confidential information could compromise our competitive position. Moreover, we have in the past been involved in, and may in the future be involved in legal or administrative proceedings involving our intellectual property and initiated by third parties, which proceedings can result in significant costs and commitment of management time and attention. As our product candidates continue in development, third parties may attempt to challenge the validity and enforceability of our patents and proprietary information and technologies.

We also have in the past been involved in, and may in the future be involved in initiating legal or administrative proceedings involving the product candidates and intellectual property of our competitors. These proceedings can result in significant costs and commitment of management time and attention, and there can be no assurance that our efforts would be successful in preventing or limiting the ability of our competitors to market competing products. Composition-of-matter patents relating to the active pharmaceutical ingredient are generally considered to be the strongest form of intellectual property protection for pharmaceutical products, as such patents provide protection not limited to any one method of use or manufacture. Method-of-use and method-of-manufacture patents protect the use or manufacture of a product for the specified method(s), and do not prevent a competitor from making and marketing a product that is identical to our product for an indication that is outside the scope of the patented method. We rely on a combination of these and other types of patents to protect our product candidates, and there can be no assurance that our intellectual property will create and sustain the competitive position of our product candidates.

Biotechnology and pharmaceutical product patents involve highly complex legal and scientific questions and can be uncertain. Any patent applications that we own or license may fail to result in issued patents. Even if patents do successfully issue from our applications, third parties may challenge their validity or enforceability, which may result in such patents being narrowed, invalidated, or held unenforceable. Even if our patents and patent applications are not challenged by third parties, those patents and patent applications may not prevent others from designing around our claims and may not otherwise adequately protect our product candidates. If the breadth or strength of protection provided by the patents and patent applications we hold with respect to our product candidates is threatened, competitors with significantly greater resources could threaten our ability to commercialize our product candidates.

Subject to meeting other requirements for patentability, for United States patent applications filed prior to March 16, 2013, the first to invent the claimed invention is entitled to receive patent protection for that invention while, outside the United States, the first to file a patent application encompassing the invention is entitled to patent protection for the invention. The United States moved to a “first to file” system under the Leahy-Smith America Invents Act, or AIA, effective March 16, 2013. Discoveries are generally published in the scientific literature well after their actual development, and patent applications in the United States and other countries are typically not published until 18 months after filing, and in some cases are never published. Accordingly, we cannot be certain that we or our licensors were the first to make the inventions claimed in our owned and licensed United States patents or patent applications filed prior to March 16, 2013, or that we or our licensors were the first to file for patent protection for inventions claimed in foreign patents or foreign patent applications and United States patents or patent applications filed on or after March 16, 2013. The AIA also includes new procedures for challenging issued patents and pending patent applications, which creates additional uncertainty. We may become involved in opposition or interference proceedings challenging our patents and patent applications or the patents and patent applications of others, and the outcome of any such proceedings are highly uncertain. An unfavorable outcome in any such proceedings could reduce the scope of, or invalidate, our patent rights, allow third parties to commercialize our technology and compete directly with us, or result in our inability to manufacture, develop or commercialize our product candidates without infringing the patent rights of others.

In addition to the protection afforded by patents, we seek to rely on trade secret protection and confidentiality agreements to protect proprietary know-how, information, or technology that is not covered by our patents. Although our agreements require all of our employees to assign their inventions to us, and we require all of our employees, consultants, advisors and any third parties who have access to our trade secrets, proprietary know-how and other confidential information and technology to enter into appropriate confidentiality agreements, we cannot be certain that our trade secrets, proprietary know-how and other confidential information and technology will not be subject to unauthorized disclosure or that our competitors will not otherwise gain access to or independently develop substantially equivalent trade secrets, proprietary know-how and other information and technology. Furthermore, the laws of some foreign countries do not protect proprietary rights to the same extent or in the same manner as the laws of the United States. As a result, we may encounter significant problems in protecting and defending our intellectual property globally. If we are unable to prevent unauthorized disclosure of our intellectual property related to our product candidates and technology to third parties, we may not be able to establish or maintain a competitive advantage in our market, which could materially adversely affect our business and operations.

**Intellectual property disputes with third parties and competitors may be costly and time consuming, and may negatively affect our competitive position.**

Our commercial success may depend on our avoiding infringement of the patents and other proprietary rights of third parties as well as on enforcing our patents and other proprietary rights against third parties. Pharmaceutical and biotechnology intellectual property disputes are characterized by complex, lengthy and expensive litigation over patents and other intellectual property rights. We may initiate or become a party to, or be threatened with, future litigation or other proceedings regarding intellectual property rights with respect to our product candidates and competing products.

As our product candidates progress toward commercialization, we or our collaboration partners may be subject to patent infringement claims from third parties. We attempt to ensure that our product candidates do not infringe third party patents and other proprietary rights. However, the patent landscape in competitive product areas is highly complex, and there may be patents of third parties of which we are unaware that may result in claims of infringement. Accordingly, there can be no assurance that our product candidates do not infringe proprietary rights of third parties, and parties making claims against us may seek and obtain injunctive or other equitable relief, which could potentially block further efforts to develop and commercialize our product candidates. Any litigation involving defense against claims of infringement, regardless of the merit of such claims, would involve substantial litigation expense and would be a substantial diversion of management time.

We intend, if necessary, to vigorously enforce our intellectual property in order to protect the proprietary position of our product candidates. Active efforts to enforce our patents may include litigation, administrative proceedings, or both, depending on the potential benefits that might be available from those actions and the costs associated with undertaking those efforts against third parties. We carefully review and monitor publicly available information regarding products that may be competitive with our product candidates and assert our intellectual property rights where appropriate.

We may consider administrative proceedings and other means for challenging third party patents and patent applications. Third parties may also challenge our patents and patent applications, through interference, reexamination, ***inter partes*** review, and post-grant review proceedings before the USPTO or through other comparable proceedings, such as oppositions or invalidation proceedings, before foreign patent offices. An unfavorable outcome in any such challenge could require us to cease using the related technology and to attempt to license rights to it from the prevailing third party, which may not be available on commercially reasonable terms, if at all, in which case our business could be harmed. Even if we are successful, participation in administrative proceedings before the USPTO or a foreign patent office may result in substantial costs and time on the part of our management and other employees.

Furthermore, there is a risk that any public announcements concerning the status or outcomes of intellectual property litigation or administrative proceedings may adversely affect the price of our stock. If securities analysts or our investors interpret such status or outcomes as negative or otherwise creating uncertainty, our common stock price may be adversely affected.

**Our reliance on third parties and agreements with collaboration partners requires us to share our trade secrets, which increases the possibility that a competitor may discover them or that our trade secrets will be misappropriated or disclosed.**

Our reliance on third party contractors to develop and manufacture our product candidates is based upon agreements that limit the rights of the third parties to use or disclose our confidential information, including our trade secrets and know-how. Despite the contractual provisions, the need to share trade secrets and other confidential information increases the risk that such trade secrets and information are disclosed or used, even if unintentionally, in violation of these agreements. In the highly competitive markets in which our product candidates are expected to compete, protecting our trade secrets, including our strategies for addressing competing products, is imperative, and any unauthorized use or disclosure could impair our competitive position and may have a material adverse effect on our business and operations.

In addition, our collaboration partners are larger, more complex organizations than ours, and the risk of inadvertent disclosure of our proprietary information may be increased despite their internal procedures and contractual obligations in place with our collaboration partners. Despite our efforts to protect our trade secrets and other confidential information, a competitor's discovery of such trade secrets and information could impair our competitive position and have an adverse impact on our business.

**We have an extensive worldwide patent portfolio. The cost of maintaining our patent protection is high and maintaining our patent protection requires continuous review and compliance in order to maintain worldwide patent protection. We may not be able to effectively maintain our intellectual property position throughout the major markets of the world.**

The USPTO and foreign patent authorities require maintenance fees and payments as well as continued compliance with a number of procedural and documentary requirements. Noncompliance may result in abandonment or lapse of the subject patent or patent application, resulting in partial or complete loss of patent rights in the relevant jurisdiction. Non-compliance may result in reduced royalty payments for lack of patent coverage in a particular jurisdiction from our collaboration partners or may result in competition, either of which could have a material adverse effect on our business.

We have made, and will continue to make, certain strategic decisions in balancing costs and the potential protection afforded by the patent laws of certain countries. As a result, we may not be able to prevent third parties from practicing our inventions in all countries throughout the world, or from selling or importing products made using our inventions in and into the United States or other countries. Third parties may use our technologies in territories in which we have not obtained patent protection to develop their own products and, further, may infringe our patents in territories which provide inadequate enforcement mechanisms, even if we have patent protection. Such third party products may compete with our product candidates, and our patents or other intellectual property rights may not be effective or sufficient to prevent them from competing.

**The laws of some foreign countries do not protect proprietary rights to the same extent as do the laws of the United States, and we may encounter significant problems in securing and defending our intellectual property rights outside the United States.**

Many companies have encountered significant problems in protecting and defending intellectual property rights in certain countries. The legal systems of certain countries do not always favor the enforcement of patents, trade secrets, and other intellectual property rights, particularly those relating to pharmaceutical and biotechnology products, which could make it difficult for us to stop infringement of our patents, misappropriation of our trade secrets, or marketing of competing products in violation of our proprietary rights. Proceedings to enforce our intellectual property rights in foreign countries could result in substantial costs and divert our efforts and attention from other aspects of our business, and could put our patents in these territories at risk of being invalidated or interpreted narrowly, or our patent applications at risk of not granting, and could provoke third parties to assert claims against us. We may not prevail in all legal or other proceedings that we may initiate and, if we were to prevail, the damages or other remedies awarded, if any, may not be commercially meaningful. Accordingly, our efforts to enforce our intellectual property rights around the world may be inadequate to obtain a significant commercial advantage from the intellectual property that we develop or license.

**Intellectual property rights do not address all potential threats to any competitive advantage we may have.**

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

- Others may be able to make cellular treatments that are the same as or similar to our current or future product candidates but that are not covered by the claims of the patents that we own or have exclusively licensed.
- We or any of our licensors or strategic partners might not have been the first to make the inventions covered by the issued patent or pending patent application that we own or have exclusively licensed.
- We or any of our licensors or strategic partners might not have been the first to file patent applications covering certain of our inventions.
- Others may independently develop similar or alternative technologies or duplicate any of our technologies without infringing our intellectual property rights.
- The prosecution of our pending patent applications may not result in granted patents.

- Granted patents that we own or have exclusively licensed may not provide us with any competitive advantages, or may be held invalid or unenforceable, as a result of legal challenges by our competitors.

- Patent protection on our product candidates may expire before we are able to develop and commercialize the product, or before we are able to recover our investment in the product.

- Our competitors might conduct research and development activities in the United States and other countries that provide a safe harbor from patent infringement claims for such activities, as well as in countries in which we do not have patent rights, and may then use the information learned from such activities to develop competitive products for sale in markets where we intend to market our product candidates.

**If we fail to meet our obligations under license agreements, we may lose our rights to key technologies on which our business depends.**

Our business will depend in part on several technologies that are based in part on technology licensed from third parties, including the University of California, and the Wisconsin Alumni Research Foundation. Those third-party license agreements impose obligations on us, including payment obligations and obligations to pursue development of commercial products under the licensed patents or technology. If a licensor believes that we have failed to meet our obligations under a license agreement, the licensor could seek to limit or terminate our license rights, which could lead to costly and time-consuming litigation and, potentially, a loss of the licensed rights. During the period of any such litigation our ability to carry out the development and commercialization of potential products, and our ability to raise capital, could be significantly and negatively affected. If our license rights were restricted or ultimately lost, we would not be able to continue to use the licensed technology in our business.

**The price and sale of any of our products that receive regulatory approval may be limited by health insurance coverage and government regulation.**

Success in selling any of our products that receive regulatory approval may depend in part on the extent to which health insurance companies, HMOs, and government health administration authorities such as Medicare and Medicaid will pay for the cost of the products and related treatment. Until we actually introduce a new product into the medical market place we will not know with certainty whether adequate health insurance, HMO, and government coverage will be available to permit the product to be sold at a price high enough for us to generate a profit. In some foreign countries, pricing or profitability of health care products is subject to government control which may result in low prices for our products. In the United States, there have been a number of federal and state proposals to implement similar government controls, and new proposals are likely to be made in the future.

**The implementation of the ACA in the United States may adversely affect our business.**

As a result of the March 2010 adoption of the ACA in the United States, substantial changes are being made to the current system for paying for healthcare in the United States, including programs to extend medical benefits to millions of individuals who currently lack insurance coverage. The changes contemplated by the ACA are subject to rule-making and implementation timelines that extend for several years, as well as initiatives in Congress to amend or repeal the law, and this uncertainty limits our ability to forecast changes that may occur in the future. However, implementation of the ACA has already begun with respect to certain significant cost-saving measures, including changes to several government healthcare programs that may cover the cost of our future products, including Medicaid, Medicare Parts B and D, and these efforts could have a materially adverse impact on our future financial prospects and performance. For example, with respect to Medicaid, in order for a manufacturer's products to be reimbursed by federal funding under Medicaid, the manufacturer must enter into a Medicaid rebate agreement with the Secretary of the United States Department of Health and Human Services, and must pay certain rebates to the states based on utilization data provided by each state to the manufacturer and to CMS, and based on pricing data provided by the manufacturer to the federal government. The states share this savings with the federal government, and sometimes implement their own additional supplemental rebate programs. Under the Medicaid drug rebate program, the rebate amount for most branded drug products was previously equal to a minimum of 15.1% of the Average Manufacturer Price, or AMP, or the AMP less Best Price, whichever is greater. Effective January 1, 2010, the ACA generally increases the size of the Medicaid rebates paid by manufacturers for single source and innovator multiple source (brand name) drug product from a minimum of 15.1% to a minimum of 23.1% of the AMP, subject to certain exceptions, for example, for certain clotting factors, the increase is limited to a minimum of 17.1% of the AMP. For non-innovator multiple source (generic) products, the rebate percentage is increased from a minimum of 11.0% to a minimum of 13.0% of AMP. In 2010, the ACA also newly extended this rebate obligation to prescription drugs covered by Medicaid managed care organizations. These increases in required rebates may adversely affect our future financial prospects and performance. The ACA also creates new rebate obligations for products under Medicare Part D, a partial, voluntary prescription drug benefit created by the United States federal government primarily for persons 65 years old and over. The Part D drug program is administered through private insurers that contract with CMS. Beginning in 2011, the healthcare reform law generally requires that in order for a drug manufacturer's products to be reimbursed under Medicare Part D, the manufacturer must enter into a Medicare Coverage Gap Discount Program agreement with the Secretary of the United States Department of Health and Human Services, and reimburse each Medicare Part D plan sponsor an amount equal to 50% savings for the manufacturer's brand name drugs and biologics which the Part D plan sponsor has provided to its Medicare Part D beneficiaries who are in the "donut hole" (or a gap in Medicare Part D coverage for beneficiaries who have expended certain amounts for drugs). The Part D plan sponsor is responsible for calculating and providing the discount directly to its beneficiaries and for reporting these amounts paid to CMS's contractor, which notifies drug manufacturers of the rebate amounts it must pay to each Part D plan sponsor. The rebate requirement could adversely affect our future financial performance, particularly if contracts with Part D plans cannot be favorably renegotiated or the Part D plan sponsors fail to accurately calculate payments due in a manner that overstates our rebate obligation. The ACA also introduced a biosimilar pathway that will permit companies to obtain FDA approval of generic versions of existing biologics based upon reduced documentation and data requirements deemed sufficient to demonstrate safety and efficacy than are required for the pioneer biologics. The new law provides that a biosimilar application may be submitted as soon as four years after the reference product is first licensed, and that the FDA may not make approval of an application effective until 12 years after the reference product was first licensed. With the likely introduction of biosimilars in the United States, we expect in the future to face greater competition from biosimilar products, including a possible increase in patent challenges. The FDA has reported meeting with sponsors who are interested in developing biosimilar products, and is developing regulations to implement the abbreviated regulatory review pathway. Regarding access to our products, the ACA established and provided significant funding for a Patient-Centered Outcomes Research Institute to coordinate and fund Comparative Effectiveness Research, or CER. While the stated intent of CER is to develop information to guide providers to the most efficacious therapies, outcomes of CER could influence the reimbursement or coverage for therapies that are determined to be less cost-effective than others. Should any of our products be determined to be less cost effective than alternative therapies, the levels of reimbursement for these products, or the willingness to reimburse at all, could be impacted, which could materially impact our future financial prospects and results.

## Risks Related to Our Relationship With BioTime

**BioTime has a significant influence on our business operations.**

As of December 1, 2016, BioTime owns approximately 47% of our issued and outstanding Common Stock. Because BioTime is by far our largest shareholder and owns close to a majority of the outstanding Common Stock, it has the voting power to significantly impact any matter that requires shareholder approval. Furthermore, three of the nine members of our Board of Directors are also directors of BioTime, and another director is an employee of Broadwood Capital, Inc., which is the general partner of Broadwood Partners, L.P., the partnership that is the largest shareholder of BioTime. Some of our directors also serve on the Boards of Directors of one or more of BioTime's other subsidiaries. As a result of the relationships described above, BioTime has significant influence over our business operations, and therefore, BioTime could cause corporate actions to be taken even if the interests of BioTime conflict with the interests of our other shareholders. This concentration of voting power could have the effect of deterring or preventing a change in control that might be beneficial to our other shareholders.

**We partially rely upon BioTime for certain services and resources**

Although we have our own research facilities, scientific personnel, and some management and administrative personnel, we partially rely on BioTime to provide certain management and administrative services, including financial services related to financial accounting and reporting. We have entered into a Shared Facilities and Services Agreement with BioTime under which we have agreed to bear costs allocated to us by BioTime for the use of BioTime human resources and for services and materials provided for our benefit by BioTime. We pay BioTime 105% of its costs of providing personnel and services to us, and for any use of its facilities by us, including an allocation of general overhead based on that use. We may also share the services of some research personnel with BioTime.

If BioTime's personnel that we rely upon to provide these services are not sufficient to serve both BioTime's needs and ours, we will have to hire additional personnel of our own, either on a full-time or part-time basis, as employees or as consultants, and the cost of doing so could be greater than the costs that would be allocated to us by BioTime. Also, any new personnel that we may need to hire may not be as familiar with our business or operations as BioTime's personnel, which means that we would incur the expense and inefficiencies related to training new employees or consultants.

**Conflicts of interest may arise from our relationship with BioTime**

Our relationship with BioTime could give rise to certain conflicts of interest that could have an impact on our research and development programs, business opportunities, and operations generally.

- We and BioTime or any of its other subsidiaries may determine to engage in research and development of the same or similar products or technologies, or products that would otherwise compete in the market place. Even if we utilize different technologies than BioTime or its other subsidiaries, we could find ourselves in competition with them for research scientists, financing and other resources, licensing, manufacturing, and distribution

- Because of our relationship with BioTime as described in the prior risk factor, BioTime could prevent us from engaging in research and development programs, investments, business ventures, or agreements to develop, license, or acquire products or technologies that would or might compete with those owned, licensed, or under development by BioTime or any of its other subsidiaries.

- In February 2016, we entered into a certain Cross-License Agreement (the "Cross License") with BioTime a subsidiary of BioTime, ES Cell International Pte Ltd. Under this Cross-License Agreement, we received a fully-paid, non-royalty-bearing, world-wide, non-exclusive, sub-licensable license under certain patents and related patent rights owned by BioTime and ES Cell International, and in exchange, we granted BioTime and ES Cell International a fully-paid, non-royalty-bearing, world-wide, non-exclusive, sub-licensable license certain patents and related patent rights we own. In the future, we may enter into additional license or sublicense agreements with BioTime or another BioTime subsidiary. Conflicts of interest could arise in determining the scope and financial terms of any such licenses or sublicenses, including the fields of use permitted, licensing fees, and royalties, if any, and other matters.

- BioTime and its other subsidiaries will engage for their own accounts in research and product development programs, investments, and business ventures, and we will not be entitled to participate or to receive an interest in those programs, investments, or business ventures. BioTime and its other subsidiaries will not be obligated to present any particular research and development, investment, or business opportunity to us, even if the opportunity would be within the scope of our research and development plans or programs, business objectives, or investment policies. These opportunities may include, for example, opportunities to acquire businesses or assets, including but not limited to patents and other intellectual property that could be used by us or by BioTime or by any of BioTime's other subsidiaries. Our respective boards of directors will have to determine which company should pursue those opportunities, taking into account relevant facts and circumstances at the time, such as the financial and other resources of the companies available to acquire and utilize the opportunity, and the best "fit" between the opportunity and the business and research and development programs of the companies. However, by virtue of their significant voting power, BioTime may have the significant influence in decision making with respect to the allocation of opportunities.

- Under the Cross License, Bio and ES Cell International may have a conflict of interest in determining how and when they should enforce their rights under the Cross License if they were to default or otherwise fail to perform any of their obligations under the Cross License.

- One of our significant assets is 3,852,880 BioTime common shares that we held as of December 1, 2016. We may sell the BioTime common shares from time to time, or to pledge those shares as collateral for loans, to raise capital to finance our operations. Because a sale of those shares could have a depressing effect on the market value of BioTime common shares, BioTime will have a continuing interest in the number of shares we sell, the prices at which we sell the shares, and time and manner in which the shares are sold. Further, we may need or find it desirable to sell BioTime common shares at the same time as BioTime, or other BioTime subsidiaries that hold BioTime common shares, also desire to sell some of their BioTime common shares. Concurrent sales of BioTime common shares by us, BioTime, or other BioTime subsidiaries could have a depressing effect on the market price of the BioTime common shares, lowering the price at which we and they are able to sell BioTime common shares and resulting in lower net proceeds from the sales. We may coordinate any future sales of our BioTime common shares with BioTime and its other subsidiaries in order to provide an orderly and controlled process for raising capital through the sale of BioTime shares. This may include an agreement as to the number of shares to be sold, the time period or "market window" for selling shares, the use of a common securities broker-dealer, and a fair allocation of net sales based on average sales prices during any trading day on which we and they sell BioTime shares.

- Each conflict of interest will be resolved by our respective boards of directors in keeping with their fiduciary duties and such policies as they may implement from time to time. However, the terms and conditions of patent and technology licenses and other agreements between us and BioTime or other BioTime subsidiaries will not be negotiated on an arm's-length basis due to BioTime's ownership of a controlling interest in us and due to the commonality of directors serving on our respective boards of directors.

## Risks Related to Our Dependence on Third Parties

**We could lose our CIRM grant if we fail to meet the clinical trial milestones that are a condition to CIRM's obligation to provide funding.**

We are depending upon our grant from CIRM as a source of financing for the costs of conducting our Phase 1/2a clinical trial and process development of AST-OPC1. Under the terms of the CIRM grant, as amended effective March 2, 2016, we must meet certain progress milestones pertaining to the clinical trial in order to receive additional payments. If we fail to meet the milestones, payments will be delayed. Additionally, under the agreement CIRM has the right to suspend payment upon the occurrence of certain Suspension Events, which could force us to postpone, delay, or discontinue the clinical trial and development work for the product.

**Establishing and maintaining strategic alliances is a key component of our business strategy. If we are unable to establish and maintain strategic alliances for our therapeutic product candidates, we may have to reduce or delay our product development or increase our expenditures.**

A key component of our current strategy for developing, manufacturing and commercializing our therapeutic product candidates will be entering into strategic alliances with pharmaceutical companies or other industry participants to advance our programs and enable us to maintain our financial and operational capacity. We will face significant competition in seeking appropriate alliances. We may not be able to negotiate alliances on acceptable terms, if at all. If our strategic alliances do not result in the successful development and commercialization of our product candidates or if one or more of our collaborators terminates its agreement with us, we may not receive any future research and development funding or milestone or royalty payments under the collaboration. If we do not receive the funding we expect under these agreements, our continued development of our product candidates could be delayed and we may need to obtain additional funding, which may be unavailable or available only on unfavorable terms.

If we are able to enter into product development and marketing arrangements with pharmaceutical companies, we may license product development, manufacturing, and marketing rights to the pharmaceutical company or to a joint venture company formed with the pharmaceutical company. Under such arrangements we might receive only a royalty on sales of the products developed or an equity interest in a joint venture company that develops the product. As a result, our revenues from the sale of those products may be substantially less than the amount of revenues and gross profits that we might receive if we were to develop, manufacture, and market the products ourselves.

**We may become dependent on possible future collaborations to develop and commercialize many of our product candidates and to provide the manufacturing, regulatory compliance, sales, marketing and distribution capabilities required for the success of our business.**

We may enter into various kinds of collaborative research and development, manufacturing, and product marketing agreements to develop and commercialize our products. Any future milestone payments and cost reimbursements from collaboration agreements could provide an important source of financing for our research and development programs, thereby facilitating the application of our technology to the development and commercialization of our products, but there are risks associated with entering into collaboration arrangements.

There is a risk that we could become dependent upon one or more collaborative arrangements for product development or manufacturing or as a source of revenues from the sale of any products that may be developed by us alone or through one of the collaborative arrangements. A collaborative arrangement upon which we might depend might be terminated by our collaboration partner or they might determine not to actively pursue the development or commercialization of our products. A collaboration partner also may not be precluded from independently pursuing competing products and drug delivery approaches or technologies.

There is a risk that a collaboration partner might fail to perform its obligations under the collaborative arrangements or may be slow in performing its obligations. In addition, a collaboration partner may experience financial difficulties at any time that could prevent it from having available funds to contribute to the collaboration. If a collaboration partner fails to conduct its product development, manufacturing, commercialization, regulatory compliance, sales and marketing or distribution activities successfully and in a timely manner, or if it terminates or materially modifies its agreements with us, the development and commercialization of one or more product candidates could be delayed, curtailed or terminated because we may not have sufficient financial resources or capabilities to continue product development, manufacturing, and commercialization on our own.

**Industry and other market data used in this Prospectus, including those undertaken by us or our engaged consultants, may prove to be unrepresentative of current and future market conditions or future results.**

This Prospectus includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties, and surveys and studies we commissioned, regarding the market potential for our product candidates. Although we believe that such information has been obtained from sources believed to be reliable, neither the sources of such data, nor we, can guarantee the accuracy or completeness of such information. While we believe these industry publications and third party research, surveys and studies are reliable, we have not independently verified such data. With respect to the information from third party consultants, the results of that study represent the independent consultants' own methodologies, assumptions, research, analysis, projections, estimations, composition of respondent pool, presentation of data, and adjustments, each of which may ultimately prove to be incorrect, and cause actual results and market viability to differ materially from those presented in such report. Readers should not place undue reliance on this information.

## Risks Pertaining to Our Common Stock

Ownership of our common stock will entail certain risks associated with the volatility of prices for our shares and the fact that we do not pay dividends on our common stock.

**The price of our common stock may rise and fall rapidly.**

The market price of our common stock like that of the shares of many biotechnology companies, is highly volatile. The price of our common stock may rise or fall rapidly as a result of a number of factors, including:

- sales or potential sales of substantial amounts of our common stock;
- results of preclinical testing or clinical trials of our product candidates or those of our competitors;
- announcements about us or about our competitors, including clinical trial results, regulatory approvals, new product introductions and commercial results;
- the cost of our development programs;
- the success of competitive products or technologies;
- litigation and other developments relating to our issued patents or patent applications or other proprietary rights or those of our competitors;
- conditions in the pharmaceutical or biotechnology industries;
- actual or anticipated changes in estimates as to financial results, development timelines or recommendations by securities analysts;
- variations in our financial results or those of companies that are perceived to be similar to us, including the failure of our earnings to meet analysts' expectations; and
- general economic, industry and market conditions.

Many of these factors are beyond our control. The stock markets in general, and the market for pharmaceutical and biotechnological companies in particular, have been experiencing extreme price and volume fluctuations which have affected the market price of the equity securities without regard to the operating performance of the issuing companies. Broad market fluctuations, as well as industry factors and general economic and political conditions, may adversely affect the market price of our common stock.

**The JOBS Act allows us to postpone the date by which we must comply with certain laws and regulations intended to protect investors and to reduce the amount of information we provide in our reports filed with the Commission, which could undermine investor confidence in our company and adversely affect the market price of our securities.**

The JOBS Act is intended to reduce the regulatory burden on "emerging growth companies." As defined in the JOBS Act, a public company whose initial public offering of common equity securities occurred after December 8, 2011 and whose annual gross revenues are less than $1.0 billion will, in general, qualify as an emerging growth company until the earliest of:

- the last day of its fiscal year following the fifth anniversary of the date of its initial public offering of common equity securities;
- the last day of its fiscal year in which it has annual gross revenue of $1.0 billion or more;
- the date on which it has, during the previous three-year period, issued more than $1.0 billion in non-convertible debt; and
- the date on which it is deemed to be a "large accelerated filer," which will occur at such time as we (a) have an aggregate worldwide market value of common equity securities held by non-affiliates of $700 million or more as of the last business day of its most recently completed second fiscal quarter, (b) have been required to file annual and quarterly reports under the Securities Exchange Act of 1934 for a period of at least 12 months, and (c) have filed at least one annual report pursuant to the Securities Exchange Act of 1934.

Under this definition, we are an emerging growth company and could remain an emerging growth company until as late as December 31, 2019.

The JOBS Act provides that, so long as we qualify as an emerging growth company, we will, among other things:

- be exempt from the provisions of Section 404(b) of the Sarbanes-Oxley Act requiring that our independent registered public accounting firm provide an attestation report on the effectiveness of our internal control over financial reporting;
- be exempt from the "say on pay" provisions (requiring a non-binding stockholder vote to approve compensation of certain executive officers) and the "say on golden parachute" provisions (requiring a non-binding stockholder vote to approve golden parachute arrangements for certain executive officers in connection with mergers and certain other business combinations) of the Dodd-Frank Act and certain disclosure requirements of the Dodd-Frank Act relating to compensation of our chief executive officer;
- be permitted to omit the detailed compensation discussion and analysis from proxy statements and reports filed under the Securities Exchange Act of 1934 and instead provide a reduced level of disclosure concerning executive compensation; and
- be exempt from any rules that may be adopted by the Public Company Accounting Oversight Board requiring mandatory audit firm rotation or a supplement to the auditor's report on the financial statements.

Although we are still evaluating the JOBS Act, we currently take advantage of the reduced regulatory and reporting requirements that are available to us so long as we qualify as an "emerging growth company," except that we have irrevocably elected not to take advantage of the extension of time to comply with new or revised financial accounting standards available under Section 102(b) of the JOBS Act. Among other things, this means that our independent registered public accounting firm will not be required to provide an attestation report on the effectiveness of our internal control over financial reporting so long as we qualify as an emerging growth company, which may increase the risk that weaknesses or deficiencies in our internal control over financial reporting go undetected. Likewise, so long as we qualify as an emerging growth company, we may elect not to provide you with certain information, including certain financial information and certain information regarding compensation of our executive officers, that we would otherwise have been required to provide in filings we make with the Commission, which may make it more difficult for investors and securities analysts to evaluate our company. As a result, investor confidence in our company and the market price of our securities may be materially and adversely affected.

**Our stock price could decline due to the large number of outstanding shares of our common stock eligible for future sale.**

Sales of substantial amounts of our common stock in the public market, or the perception that those sales could occur, could cause the market price of our common stock to decline. Sales of substantial amounts of common stock could also make it more difficult for us to sell equity or equity-related securities in the future at a time and price that we deem appropriate.

**We do not currently intend to pay dividends on any of our classes of securities and, consequently, your ability to achieve a return on your investment will depend on the appreciation in the price of our securities.**

We have never declared or paid any cash dividends on any class of our securities. We currently intend to retain any future earnings to fund our future growth and do not expect to declare or pay any dividend on any class of our securities in the foreseeable future. As a result, you may only realize a gain on your investment in our securities if the market price of our securities appreciates and you sell your securities at a price above your cost after accounting for any taxes. The price of our securities may not appreciate in value or ever exceed the price that you paid for our securities.

**The price of our common stock, and the value of our assets, will be affected by changes in the value of the BioTime common shares that we own.**

As of December 1, 2016, we held 3,852,880 BioTime common shares. The value of our common stock will reflect, in part, the value of the BioTime common shares that we hold. The value of the BioTime common shares we hold will vary with the price at which BioTime common shares trade in the public market. The market price of BioTime common shares will be impacted by a number of factors, including the results of BioTime's operations.

**If securities analysts do not publish research or reports about our business or if they downgrade our stock, the price of our securities could decline.**

The current trading market for our common stock relies in part on the research and reports that industry or financial analysts publish about us, our business, our markets and our competitors. We do not control these analysts. If securities analysts do not cover us, the lack of research coverage may adversely affect the market price of our common stock. Furthermore, if one or more of the analysts who do cover us downgrade our stock or if those analysts issue other unfavorable commentary about us or our business, our stock price would likely decline. If one or more of these analysts cease coverage of us or fails to regularly publish reports on us, we could lose visibility in the market and interest in our stock could decrease, which in turn could cause our stock price or trading volume to decline.

**You may experience dilution of your ownership interests because of the future issuance of additional shares of our common stock and our preferred stock.**

In the future, we may issue our authorized but previously unissued equity securities, resulting in the dilution of the ownership interests of our present shareholders. We are currently authorized to issue an aggregate of 150,000,000 shares of common stock, consisting of 75,000,000 Series A Shares, which we refer to as the "Common Stock" here in this prospectus, and 75,000,000 of our Series B Common Stock, of which none are currently outstanding. We are also authorized to issue 5,000,000 shares of "blank check" preferred stock. As of December 1, 2016, we had issued and outstanding 46,686,410 shares of Common Stock. We have also reserved 6,697,870 shares of Common Stock for issuance upon the exercise of outstanding warrants. We have also reserved 11,000,000 shares of Common Stock for issuance under a stock option and stock purchase plan, of which, 2,222,254 shares were available for issuance.

We may issue additional shares of Common Stock or other securities in order to raise additional capital, or in connection with hiring or retaining employees or consultants, or in connection with future acquisitions of licenses to technology or rights to acquire products, in connection with future business acquisitions, or for other business purposes. The future issuance of any such additional shares of common stock or other securities may create downward pressure on the trading price of our Common Stock.

We may also issue 5,000,000 shares of preferred stock having rights, preferences, and privileges senior to the rights of our common stock with respect to dividends, rights to share in distributions of our assets if we liquidate our company, or voting rights. Any preferred stock may also be convertible into Series A Shares on terms that would be dilutive to holders of common stock.

## USE OF PROCEEDS

We will retain broad discretion over the use of net proceeds to us from the sale of our securities offered hereby. Except as may be otherwise described in a prospectus supplement, we currently anticipate using any net proceeds to us for general corporate purposes. The amounts and timing of our actual expenditures may vary significantly depending upon numerous factors.

Pending the application of such proceeds, we may invest the proceeds in short-term, interest bearing, investment-grade marketable securities or money market obligations.

## DESCRIPTION OF CAPITAL STOCK

### General

Our Amended and Restated Certificate of Incorporation currently authorizes us to issue an aggregate of 155,000,000 shares of capital stock, of which (i) 150,000,000 are shares of common stock comprised of 75,000,000 shares of Series A Common Stock, par value $0.0001 per share (which we refer to as the "Common Stock" in this prospectus), and 75,000,000 shares of Series B Common Stock, par value $0.0001 per share (the "Series B Common Stock"), and (ii) 5,000,000 are shares of "blank check" preferred stock (the "Preferred Stock"), par value $0.0001 per share.

As of December 1, 2016, we had 46,686,410 shares of Common Stock issued and outstanding and an additional 8,920,124 shares of Common Stock issuable upon exercise of outstanding options and warrants. No Series B Common Stock or shares of Preferred Stock are issued and outstanding.

The following summary description of our capital stock is based on the provisions of our certificate of incorporation and bylaws and the applicable provisions of the Delaware General Corporation Law. This information is qualified entirely by reference to the applicable provisions of our certificate of incorporation, bylaws and the Delaware General Corporation Law. For information on how to obtain copies of our certificate of incorporation and bylaws, which are exhibits to the registration statement of which this prospectus is a part, see "Where You Can Find Additional Information."

### Preferred Stock

Our certificate of incorporation currently authorizes the issuance of up to 5,000,000 shares of Preferred Stock. We may issue Preferred Stock in one or more series, at any time, with such powers, preferences, and rights, and qualifications, limitations and restrictions as our Board of Directors may determine, all without further action of our shareholders. Our Board of Directors may, by resolution, increase or decrease (but not below the number of shares of such series then outstanding) the number of shares of any series of Preferred Stock subsequent to the issue of shares of that series. Any series of Preferred Stock which may be authorized by the Board of Directors in the future may be senior to and have greater rights and preferences than the Common Stock. There are no shares of Preferred Stock presently outstanding and we have no present plan, arrangement or commitment to issue any Preferred Stock.

### Common Stock

#### *Rights and Preferences*

Holders of Common Stock have no preemptive, conversion or subscription rights and there are no redemption or sinking fund provisions applicable to the Common Stock. The rights, preferences and privileges of the 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 in the future.

#### *Voting Rights*

Each holder of record of Common Stock or Series B Common Stock is entitled to one vote for each outstanding share of Common Stock or Series B Common Stock owned on every matter properly submitted to the shareholders for their vote. The Common Stock and Series B Common Stock will vote together as a single class, without distinction as to series on all matters except as may otherwise be required by Delaware law.

Subject to any voting rights that might be afforded to holders of any Preferred Stock that might be outstanding, matters submitted to our shareholders for a vote will generally require for approval the affirmative vote of a majority of the shares of stock entitled to vote on the matter, without distinction as to class or series, present and voting at a meeting of shareholders at which a quorum is present, unless Delaware law requires a different vote. Delaware law requires the following vote for approval of the following matters:

- A merger or consolidation for which a vote of our shareholders is required, or a sale of all or substantially all of our assets, or a corporate dissolution, will require the affirmative vote of a majority of the outstanding shares of stock entitled to vote on the matter, without distinction as to class or series.

- An amendment of our certificate of incorporation will require the affirmative vote of a majority of the outstanding stock entitled to vote on the amendment, and a majority of the outstanding stock of each class entitled to vote on the amendment as a class. Under Delaware law, the holders of the outstanding shares of a class shall be entitled to vote as a class upon a proposed amendment, whether or not entitled to vote on the amendment by our certificate of incorporation, if the amendment would increase or decrease the aggregate number of authorized shares of the class, increase or decrease the par value of the shares of the class, or alter or change the powers, preferences, or special rights of the shares of the class so as to affect them adversely. If any proposed amendment would alter or change the powers, preferences, or special rights of one or more series of any class so as to affect them adversely, but shall not so affect the entire class, then only the shares of the series so affected by the amendment shall be considered a separate class for the purposes of the vote required to approve the amendment.

- Directors may be elected by a plurality of the shares of stock entitled to vote, voted at a meeting at which a quorum is present.

- Any director or the entire Board of Directors may be removed, with or without cause, by the holders of a majority of the shares then entitled to vote at an election of directors.

A majority of the shares entitled to vote, present in person or represented by proxy, shall constitute a quorum at a meeting of shareholders. Any action required or that may be taken at any annual or special meeting of our shareholders may be taken without a meeting, without prior notice and without a vote, if a consent or consents in writing, setting forth the action so taken, shall be signed by the holders of outstanding stock having not less than the minimum number of votes that would be necessary to authorize or take the action at a meeting at which all shares entitled to vote on the matter were present and voted.

***Dividend Rights***

Subject to the dividend rights of holders of any shares of the Preferred Stock that may be issued from time to time, holders of our Common Stock are entitled to any dividend declared by the Board of Directors out of funds legally available for that purpose. We have not paid any cash dividends on either the Common Stock or Series B Common Stock, and it is unlikely that any cash dividends will be declared or paid on any series of our Common Stock in the foreseeable future. Instead, we plan to retain our cash for use in financing our future operations and growth. We may declare and pay dividends or other distributions on Common Stock without paying a corresponding dividend or distribution on the Series B Common Stock.

***Liquidation Rights***

Subject to the prior payment of the liquidation preference to holders of any shares of Preferred Stock that may be issued, holders of Common Stock are entitled to receive on a pro rata basis, without a distinction between Common Stock and Series B Common Stock, all of our remaining assets available for distribution to the holders of Common Stock in the event of the liquidation, dissolution, or winding up of our operations.

***Preemptive Rights***

Holders of our Common Stock or Series B Common Stock do not have any preemptive rights to become subscribers or purchasers of additional shares of any series of our capital stock.

**Delaware Law**

***Delaware Statutory Business Combinations Provision***

We are subject to the anti-takeover 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 period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is, or the transaction in which the person became an interested stockholder was, approved in a prescribed manner or another prescribed exception applies. For purposes of Section 203, a "business combination" is defined broadly to include a merger, asset sale or other transaction resulting in a financial benefit to the interested stockholder, and, subject to certain exceptions, an "interested stockholder" is a person who, together with his or her affiliates and associates, owns (or within three years prior, did own) 15% or more of the corporation's voting stock. Section 203 could discourage or make it more difficult to effect a change in our management or the acquisition of control by a holder of a substantial amount of our voting stock, even if our stockholders might consider such a change to be in their best interest. These provisions are intended to enhance the likelihood of continuity and stability in the composition of our board of directors and in the policies formulated by the board of directors and to discourage certain types of transactions that may involve an actual or threatened change of control of us. These provisions are designed to reduce our vulnerability to an unsolicited acquisition proposal. The provisions also are intended to discourage certain tactics that may be used in proxy fights. Such provisions also may have the effect of preventing changes in our management.

**Transfer Agent and Registrar**

The Transfer Agent and Registrar for our Common Stock is American Stock Transfer and Trust Company LLC, 6201 15th Avenue, Brooklyn, New York 11219.

**Stock Exchange Listing**

Our Common Stock is listed on the NYSE MKT LLC under the trading symbol "AST."

## DESCRIPTION OF WARRANTS

As of December 1, 2016, there are 6,697,870 shares of Common Stock issuable upon the exercise of outstanding warrants, at a weighted average exercise price of $4.68.

| Number of Warrants | Shares Issuable(1) | Exercise Price(1) | Expiration Date |
|---|---|---|---|
| 409,152 | 409,152 | $4.28 | February 15, 2017 |
| 3,329,159 | 3,329,159 | $5.00 | February 15, 2017 |
| 2,959,559 | 2,959,559 | $4.37 | May 13, 2021 |

(1) The number of common shares and exercise price will be proportionally adjusted in the event of a stock split, stock dividend, combination, or similar recapitalization of the common shares, and upon the occurrence of certain other transactions.

***General***

Pursuant to this prospectus, we may issue, in one or more series, warrants to purchase Preferred Stock or Common Stock. The warrants may be issued independently or together with any securities and may be attached to or separate from the securities. If the warrants are issued pursuant to warrant agreements, we will so specify in the prospectus supplement relating to the warrants being offered pursuant to the prospectus supplement. While the following terms described below will apply generally to any warrants we may offer, we will describe the particular terms of any series of warrants in the applicable prospectus supplement. The terms of any warrants offered under a prospectus supplement for a particular series of warrants may specify different or additional terms than those specified below.

The prospectus supplement relating to any warrants that we may offer will contain the specific terms of the warrants. These terms may include the following:

- the title of the warrants;
- the securities (i.e., Preferred Stock or Common Stock) for which the warrants are exercisable;
- the price or prices at which the warrants will be issued;
- if applicable, the designation and terms of the Preferred Stock or Common Stock with which the warrants are issued, and the number of warrants issued with each share of Preferred Stock or Common Stock;
- the aggregate number of warrants;
- the date on which the right to exercise the warrants will commence, and the date on which the right will expire;
- any other terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of warrants.

Holders of warrants will not be entitled, by virtue of being such holders, to vote, consent, receive dividends, receive notice as stockholders with respect to any meeting of stockholders for the election of our directors or any other matter, or to exercise any rights whatsoever as our stockholders.

***Exercise of Warrants***

Each warrant will entitle the holder to purchase for cash such principal amount of securities or shares of stock at such exercise price as shall in each case be set forth in, or be determinable as set forth in, the prospectus supplement relating to the warrants offered thereby. Warrants may be exercised at any time up to the close of business on the expiration date set forth in the prospectus supplement relating to the warrants offered thereby. After the close of business on the expiration date, unexercised warrants will become void.

The warrants may be exercised as set forth in the prospectus supplement relating to the warrants offered thereby. Upon receipt of payment and the taking of other action specified in the applicable prospectus supplement, we will, as soon as practicable, forward the securities purchasable upon exercise. If less than all of the warrants represented by such warrant certificate are exercised, a new warrant certificate will be issued for the remaining warrants.

Each warrant agent will act solely as our agent under the applicable warrant agreement and will not assume any obligation or relationship of agency or trust with any holder of any warrant. A single bank or trust company may act as warrant agent for more than one issue of warrants. A warrant agent will have no duty or responsibility in case of any default by us under the applicable warrant agreement or warrant, including any duty or responsibility to initiate any proceedings at law or otherwise, or to make any demand upon us. Any holder of a warrant may, without the consent of the related warrant agent or the holder of any other warrant, enforce by appropriate legal action its right to exercise, and receive the securities purchasable upon exercise of, its warrants.

## PLAN OF DISTRIBUTION

We may sell the securities being offered by us in this prospectus pursuant to underwritten public offerings, negotiated transactions, block trades or any combination of such methods. We may sell the securities to or through underwriters, dealers, agents or directly to one or more purchasers. We and our agents reserve the right to accept and to reject in whole or in part any proposed purchase of securities. A prospectus supplement or post-effective amendment, which we will file each time we effect an offering of any securities, will provide the names of any underwriters, dealers or agents, if any, involved in the sale of such securities, and any applicable fees, commissions, or discounts to which such persons shall be entitled to in connection with such offering.

We and our agents, dealers and underwriters, as applicable, may sell the securities being offered by us in this prospectus from time to time in one or more transactions at:

- a fixed price or prices, which may be changed;
- market prices prevailing at the time of sale;
- prices related to such prevailing market prices;
- varying prices determined at the time of sale; or
- negotiated prices.

We may determine the price or other terms of the securities offered under this prospectus by use of an electronic auction. We will describe how any auction will determine the price or any other terms, how potential investors may participate in the auction and the nature of the underwriters' obligations in the applicable prospectus supplement or amendment.

We may solicit directly offers to purchase securities. We may also designate agents from time to time to solicit offers to purchase securities. Any agent that we designate, who may be deemed to be an underwriter as that term is defined in the Securities Act, may then resell such securities to the public at varying prices to be determined by such agent at the time of resale.

We may engage in at the market offerings of our securities. An at the market offering is an offering of our securities at a fixed price through a market maker. We shall name any underwriter that we engage for an at the market offering in a post-effective amendment to the registration statement containing this prospectus. We shall also describe any additional details of our arrangement with such underwriter, including commissions or fees paid, or discounts offered, by us and whether such underwriter is acting as principal or agent, in the related prospectus supplement.

If we use underwriters to sell securities, we will enter into an underwriting agreement with the underwriters at the time of the sale to them, which agreement shall be filed with the Commission. Underwriters may also receive commissions from purchasers of the securities. Underwriters may also use dealers to sell securities. In such an event, the dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for whom they may act as agents.

Underwriters, dealers, agents and other persons may be entitled, under agreements that may be entered into with us, to indemnification by us against certain civil liabilities, including liabilities under the Securities Act or to contribution with respect to payments which they may be required to make in respect of such liabilities. Underwriters and agents may engage in transactions with, or perform services for, us in the ordinary course of business.

If so indicated in the applicable prospectus supplement, we may authorize underwriters, dealers or other persons to solicit offers by certain institutions to purchase the securities offered by us under this prospectus pursuant to contracts providing for payment and delivery on a future date or dates. The obligations of any purchaser under these contracts will be subject only to those conditions described in the applicable prospectus supplement, and the prospectus supplement will set forth the price to be paid for securities pursuant to those contracts and the commissions payable for solicitation of the contracts.

Any underwriter may engage in over-allotment, stabilizing and syndicate short covering transactions and penalty bids in accordance with Regulation M of the Exchange Act. Over-allotment involves sales in excess of the offering size, which create a short position. Stabilizing transactions involve bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Syndicate short covering transactions involve purchases of securities in the open market after the distribution has been completed in order to cover syndicate short positions. Penalty bids permit the underwriters to reclaim selling concessions from dealers when the securities originally sold by such dealers are purchased in covering transactions to cover syndicate short positions. These transactions may cause the price of the securities sold in an offering to be higher than it would otherwise be. These transactions, if commenced, may be discontinued by the underwriters at any time.

Our Common Stock is listed on the NYSE MKT LLC under the symbol "AST." The other securities offered hereby are not listed on any securities exchange or other stock market and, unless we state otherwise in the applicable prospectus supplement, we do not intend to apply for listing of the other securities on any securities exchange or other stock market. Any underwriters to whom we sell securities for public offering and sale may make a market in the securities that they purchase, but the underwriters will not be obligated to do so and may discontinue any market making at any time without notice. Accordingly, we give you no assurance as to the development or liquidity of any trading market for the securities.

The anticipated date of delivery of the securities offered hereby will be set forth in the applicable prospectus supplement relating to each offering.

In order to comply with certain state securities laws, if applicable, the securities may be sold in such jurisdictions only through registered or licensed brokers or dealers. In certain states, the securities may not be sold unless the securities have been registered or qualified for sale in such state or an exemption from regulation or qualification is available and is complied with. Sales of securities must also be made by us in compliance with all other applicable state securities laws and regulations.

We shall pay all expenses of the registration of the securities.

## LEGAL MATTERS

If and when the securities being registered hereunder are issued, the validity of such issuance will be passed upon for us by Dentons US LLP, New York, New York.

## EXPERTS

OUM & Co. LLP, our independent registered public accounting firm, has audited our financial statements included in our Annual Reports on Form 10-K for the years ended December 31, 2015 and 2014, and the effectiveness of our internal control over financial reporting as of December 31, 2015 and 2014, as set forth in their reports, which are incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements are incorporated by reference in reliance on OUM & Co. LLP's reports, given on their authority as experts in accounting and auditing.

Our statements of operations, comprehensive loss, stockholders' equity and cash flows for the year ended December 31, 2013 have been audited by Rothstein Kass, independent public accounting firm, as stated in their report which is incorporated herein by reference. Such financial statements are incorporated herein by reference in reliance on the report of such firm given upon their authority as experts in accounting and auditing.

## WHERE YOU CAN FIND MORE INFORMATION

We file annual, quarterly and periodic reports, proxy statements and other information with the Commission. You may read and copy any materials that we file with the Commission at the Commission's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. You may obtain information on the operation of the Public Reference Room by calling the Commission at 1-800-SEC-0330. Many of our Commission filings are also available to the public from the Commission's website at http://www.sec.gov. We make available free of charge our annual, quarterly and current reports, proxy statements and other information upon request. To request such materials, please send an e-mail to InvestorRelations@asteriasbio.com or contact Investor Relations, at the following address or telephone number: Asterias Biotherapeutics, Inc., 6300 Dumbarton Circle, Fremont, California 94555, Attention: Investor Relations; (510) 456-3800. Exhibits to the documents will not be sent, unless those exhibits have specifically been incorporated by reference in this prospectus.

We maintain our corporate website at http://www.asteriasbiotherapeutics.com. Our website and the information contained therein or connected thereto is not incorporated into this Registration Statement.

We have filed with the Commission a registration statement on Form S-3 under the Securities Act relating to the securities we are offering by this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules to the registration statement. Please refer to the registration statement and its exhibits and schedules for further information with respect to us and our securities. Statements contained in this prospectus as to the contents of any contract or other document are not necessarily complete and, in each instance, we refer you to the copy of that contract or document filed as an exhibit to the registration statement. You may read and obtain a copy of the registration statement and its exhibits and schedules from the Commission, as described in the preceding paragraph.

## INCORPORATION BY REFERENCE

The Commission allows us to "incorporate by reference" the information we file with it, which means that we can disclose important information to you by referring you to those documents. The information incorporated by reference is considered to be part of this prospectus, and information that we file later with the Commission will automatically update and supersede this information. We incorporate by reference the documents filed with Commission listed below:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2015, filed on March 29, 2016;
- our Quarterly Reports on Form 10-Q for the quarter ended March 31, 2016, filed on May 16, 2016, the quarter ended June 30, 2016, filed on August 15, 2016 and the quarter ended September 30, 2016, filed on November 14, 2016;
- our Current Reports on Form 8-K filed with the Commission on January 22, 2016, February 18, 2016, March 3, 2016; March 8, 2016; March 14, 2016; March 16, 2016; March 24, 2016; April 12, 2016; April 29, 2016; May 10, 2016; June 14, 2016; August 9, 2016; September 19, 2016; and November 17, 2016;
- the description of our Common Stock contained in our Registration Statement on Form 8-A filed with the Commission on September 26, 2014.

All reports and other documents subsequently filed by us with the Commission pursuant to Sections 13(a), 13(c), 14, or 15(d) of the Securities Exchange Act of 1934 after the date of this prospectus and before the termination of the offering shall be deemed to be incorporated by reference in this prospectus and to be a part of this prospectus from the date of filing of such reports and documents. This prospectus also incorporates by reference any documents that we file with the Commission after the date that the initial registration statement is filed with the Commission and before the effectiveness of the registration statement. Any statement contained in any document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or in any other subsequently filed document which also is or is deemed to be incorporated by reference in this prospectus modifies or supersedes such statement. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

We will provide, without charge to each person, including any beneficial owner, to whom this prospectus is delivered, upon written or oral request of such person, a copy of any or all of the documents incorporated by reference in this prospectus other than exhibits, unless such exhibits specifically are incorporated by reference into such documents or this prospectus. Requests for such documents may be made by sending an e-mail to InvestorRelations@asteriasbio.com and requesting any one or more of such filings or by contacting Investor Relations, at the following address or telephone number: Asterias Biotherapeutics, Inc., 6300 Dumbarton Circle, Fremont, CA 94555, Attention: Investor Relations; (510) 456-3800.

Table of Contents


# Asterias Biotherapeutics, Inc.

## 4,000,000 Shares of Series A Common Stock

## PROSPECTUS SUPPLEMENT

## Chardan

October 16, 2017