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

# FORM 10-K

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

For the fiscal year ended December 31, 2016

OR

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

For the transition period from___________ to __________

Commission file number 1-12830

# BioTime, Inc.

(Exact name of registrant as specified in its charter)

| **California** | **94-3127919** |
|---|---|
| (State or other jurisdiction of incorporation or organization) | (I.R.S. Employer Identification No.) |

**1010 Atlantic Avenue, Suite 102**
**Alameda, California 94501**
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code **(510) 521-3390**

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

| **Title of each class** | **Name of exchange on which registered** |
|---|---|
| **Common shares, no par value** | **NYSE MKT** |
| **Common share purchase warrants expiring October 1, 2018** | **NYSE MKT** |

**Securities registered pursuant to Section 12(g) of the Act:**
**None**

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

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

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

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

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

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

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

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

The approximate aggregate market value of voting common shares held by non-affiliates computed by reference to the price at which common shares were last sold as of June 30, 2016 was $165,293,000. Shares held by each executive officer and director and by each person who beneficially owns more than 5% of the outstanding common shares have been excluded in that such persons may under certain circumstances be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of common shares outstanding as of March 9, 2017 was 110,853,754.

Documents Incorporated by Reference

Portions of the registrant's Proxy Statement for 2017 Annual Meeting of Shareholders are incorporated by reference in Part III

**BioTime, Inc.**

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## PART I

*Statements made in this Form 10-K that are not historical facts may constitute forward-looking statements that are subject to risks and uncertainties that could cause actual results to differ materially from those discussed. Words such as "expects," "may," "will," "anticipates," "intends," "plans," "believes," "seeks," "estimates," and similar expressions identify forward-looking statements. See "Risk Factors."*

*References to "BioTime", "we" and "our" means BioTime, Inc. and its subsidiaries unless the context otherwise indicates.*

*The description or discussion, in this Form 10-K, of any contract or agreement is a summary only and is qualified in all respects by reference to the full text of the applicable contract or agreement.*

INDUSTRY AND MARKET DATA

This Annual Report ("Report") on Form 10-K contains market data and industry forecasts that were obtained from industry publications, third party market research and publicly available information. These publications generally state that the information contained therein has been obtained from sources believed to be reliable. While we believe that the information from these publications is reliable, we have not independently verified such information.

This Annual Report on Form 10-K also contains estimates and other statistical data made by independent parties and by us relating to market size and growth and other data about our industry. We obtained the industry and market data in this Report from our own research as well as from industry and general publications, surveys and studies conducted by third parties, some of which may not be publicly available. Such data involves a number of assumptions and limitations and contains projections and estimates of the future performance of the industries in which we operate that are subject to a high degree of uncertainty. We caution you not to give undue weight to such projections, assumptions and estimates.

**Deconsolidation of Asterias Biotherapeutics, Inc. Effective May 13, 2016**

Effective May 13, 2016, BioTime deconsolidated Asterias Biotherapeutics, Inc. ("Asterias") financial statements and results of operations from those of BioTime under applicable generally accepted accounting principles due to the decrease in BioTime's percentage ownership in Asterias from 57.1% to 48.7% as a result of a sale of common stock by Asterias in a public offering. Prior to that date, Asterias was a majority-owned and consolidated subsidiary of BioTime. Since May 13, 2016, BioTime has accounted for Asterias using the equity method of accounting, electing the fair value option, with all subsequent changes in fair value included in BioTime's consolidated statements of operations in other income and expenses. Asterias' assets and liabilities are not included in BioTime's audited consolidated balance sheet at December 31, 2016 due to the deconsolidation. The fair value of Asterias shares owned by BioTime is shown on BioTime's consolidated balance sheet as of December 31, 2016. BioTime's audited consolidated statements of operations for the year ended December 31, 2016 include Asterias' results from January 1, 2016 through May 12, 2016, the day immediately preceding the deconsolidation.

Audited financial statements of Asterias for the year ended December 31, 2016 will be included as financial statement schedules in Part IV, Item 15 by an amendment to this Form 10-K.

For further discussion see the Notes to Consolidated Financial Statements and Management's Discussion and Analysis of Financial Condition and Results of Operations included elsewhere in this Report.

**Deconsolidation of OncoCyte Corporation Effective February 17, 2017**

Effective February 17, 2017, BioTime deconsolidated OncoCyte Corporation's ("OncoCyte") financial statements and results of operations from those of BioTime under applicable generally accepted accounting principles. This deconsolidation occurred due to the decrease in BioTime's percentage ownership in OncoCyte from 51.1% to 49.9% as a result of the issuance of 625,000 shares of OncoCyte common stock to certain investors who exercised OncoCyte warrants. Prior to that exercise, and for all the financial statement periods presented in this Annual Report, OncoCyte was a majority-owned and consolidated subsidiary of BioTime. Beginning on February 17, 2017, BioTime will no longer include the results of operations and cash flows of OncoCyte in its consolidated results and cash flows. As of February 17, 2017, BioTime plans to account for OncoCyte using the equity method of accounting by electing the fair value option. The fair value option requires BioTime to present the fair value of its interest in OncoCyte on its consolidated balance sheet, with changes in the fair value included in BioTime's consolidated statements of operations in other income and expenses. As of, and for each reporting period after February 17, 2017, the fair value of BioTime's interest in OncoCyte will be determined by the number of shares of OncoCyte held by BioTime and the closing price of the OncoCyte common stock as quoted on NYSE MKT: OCX.

For further discussion, see the Notes to Consolidated Financial Statements and Management's Discussion and Analysis of Financial Condition and Results of Operations included elsewhere in this Report.

**Item 1. Business**

**Overview**

BioTime is a clinical-stage biotechnology company focused on developing and commercializing products addressing degenerative diseases. Our clinical programs are based on two platform technologies: pluripotent stem cells and cell/drug delivery platform technologies. The foundation of our core therapeutic technology platform is pluripotent cells that are capable of becoming any of the cell types in the human body. The foundation of our cell delivery platform is its *HyStem*® cell and drug delivery matrix technology. Our current clinical programs are targeting three primary sectors, aesthetics, ophthalmology and cell/drug delivery.

We also have significant equity holdings in two publicly traded companies, Asterias Biotherapeutics, Inc. ("Asterias") and OncoCyte Corporation ("OncoCyte"), which we founded and which, until recently, were our majority-owned consolidated subsidiaries. Asterias (NYSE MKT: AST) is presently focused on advancing three clinical-stage programs that have the potential to address areas of very high unmet medical need in the fields of neurology (spinal cord injury) and oncology (Acute Myeloid Leukemia and lung cancer). OncoCyte (NYSE MKT: OCX) is developing confirmatory diagnostic tests for lung cancer, breast cancer, and bladder cancer utilizing novel liquid biopsy technology. The combined market value of BioTime's holdings in Asterias and OncoCyte was about $146 million as of March 9, 2017.

BioTime, Inc. and its subsidiaries and affiliates are sometimes referred to as the "BioTime Family of Companies." BioTime is also enabling early-stage programs in new technologies through its own research programs as well as through other members of the BioTime Family of Companies. These technologies have the potential to significantly improve the treatment of diseases associated with aging, including diseases such as diabetes and cardiovascular and metabolic disorders, that affect large numbers of people. We are also researching other novel technologies that may help the body regenerate certain types of degenerated cells and tissues.

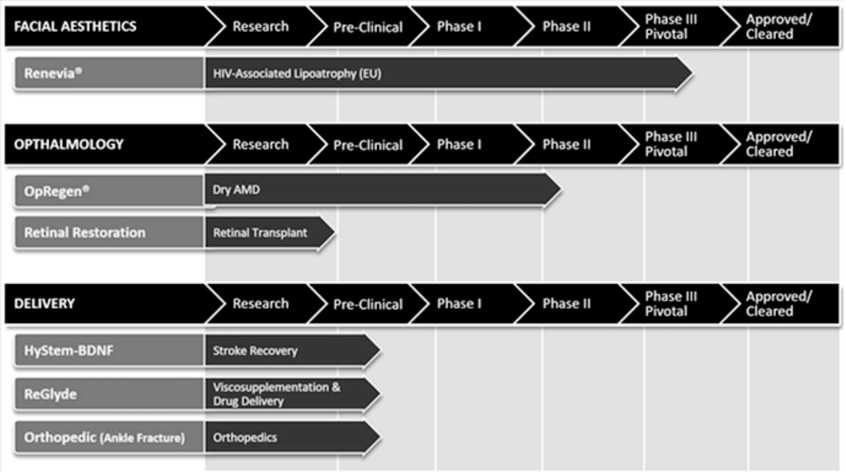
The BioTime Family of Companies currently has seven product candidates in human clinical trials, one of which is in a late-stage, pivotal study in Europe, one cancer diagnostic that is expected to be commercially launched in the U.S. later this year and several exciting early-stage programs that may help address some of the biggest unmet medical needs faced by our aging population.

***Core Technology Platforms***

We believe the BioTime Family of Companies has the world's premier collection of pluripotent stem cell assets and a proprietary therapeutic delivery platform with many potential uses. Pluripotent stem cells are capable of becoming any of the cell types in the human body. Cell types derived from pluripotent stem cells have potential applications in many areas of medicine with large unmet patient needs, including various tissue injuries and age-related degenerative diseases and degenerative conditions for which there presently are no cures. Unlike pharmaceuticals which almost always require a molecular target, cell therapy strategies use cell types derived from pluripotent stem cells to regenerate, replace or augment affected cells and tissues, and therefore may have broader applicability and impact than traditional pharmaceutical products. Our pluripotent stem cell technology is complemented by our *HyStem*® technology, which includes a family of unique, biocompatible resorbable hydrogels to deliver bioactive compositions for therapeutic benefit. *HyStem*® was designed to enable the effective transfer, engraftment and metabolic support for cells, whether derived from pluripotent stem cells or from a patient's own somatic or adult stem cells. The flexibility of the *HyStem*® technology also allows for direct therapeutic use and the sustained delivery of therapeutics.

***Clinical Therapeutic Product Candidates Being Developed By BioTime***

Our near term therapeutic focus is in three core areas: Aesthetics, Ophthalmology, and Delivery



Facial Aesthetics

*Renevia*®, our lead facial aesthetics product, is a potential treatment for facial lipoatrophy. "Lipoatrophy" is another word for "fat loss or deficiency." It is currently in a pivotal clinical trial in Europe to assess its safety and efficacy in restoring normal skin contours in patients whose subcutaneous fat, or adipose tissue, has been lost due to the use of certain drugs often used to treat patients with HIV. While this pivotal trial, if successful, is expected to enable a filing for marketing authorization in the European Union, BioTime sees this trial as also supportive of U.S. development of *Renevia*®, for the much larger market opportunity, for treating additional forms of facial volume restorations, whether from drugs, trauma or aging. *Renevia*® consists of our cell-transplantation delivery matrix (*HyStem*®) combined with the patient's own adipose progenitor cells. Developed as a superior alternative for traditional fat transfer procedures, *Renevia*® is designed to mimic the naturally-occurring extracellular matrix and provide a 3-D scaffold that enables effective cell transplant, engraftment and proliferation. *Renevia*®, is being developed with the goal of providing a natural, long-lasting improvement to the patient's skin contouring.

Ophthalmology

*OpRegen*® is our lead product for ophthalmological disorders. It is a suspension of retinal pigment epithelial (RPE) cells that are derived from pluripotent stem cells. RPE cells form the back lining of the retina, and support the function of photoreceptors (rods and cones). RPE cells can be damaged and lost in various forms of retinal degeneration. The *OpRegen*® therapeutic approach is to replace damaged or lost RPE cells and possibly slow disease progression and/or preserve or restore visual function. It is currently in a Phase I/IIa clinical trial for the treatment of the dry form of age-related macular degeneration ("AMD"). AMD affects approximately 1.6 million newly diagnosed people annually in the U.S and is the leading cause of blindness in people over the age of 60. Approximately 90 percent of AMD patients suffer from the dry form ("dry-AMD"), for which there are no FDA-approved therapies.

In February 2017, we expanded our ophthalmology portfolio through the acquisition of exclusive global rights to technology from University of Pittsburgh through the execution of an Exclusive License Agreement. This technology allows the generation of three-dimensional laminated human retinal tissue derived from human pluripotent stem cells. This tissue contains all the cell types and layers of the human retina and has shown evidence of functional integration in proof of concept animal models for advanced retinal degeneration. The technology is being developed for implantation in patients to potentially treat or prevent a variety of retinal degenerative diseases.

Delivery

In addition to *Renevia*®, we have two additional primary programs utilizing our proprietary *HyStem*® technology. *HyStem*®-BDNF is a preclinical development program for the delivery of recombinant human brain-derived neurotrophic factor (BDNF) directly into the stroke cavity of patients with the goal of aiding in tissue repair and functional recovery. *ReGlyde*™ is in preclinical development as a device for viscosupplementation and a combination product for drug delivery in osteoarthritis (OA). The viscosupplementation device program aims to administer *ReGlyde*™ directly into OA affected joints provide joint lubrication to reduce pain and improve quality of life. The drug delivery programs seek to enable the sustained release of therapeutics in affected OA joints to slow or reverse disease progression, in addition to improving pain and joint function. Also, included in our delivery platform is *Premvia*™, which is a *HyStem*® hydrogel formulation for the management of wounds including partial and full-thickness wounds, ulcers, tunneled/undermined wounds, surgical wounds, and burns. *Premvia*™ was cleared by the FDA via a 510(k) device approval pathway.

In addition to these programs, BioTime is developing *HyStem*® product enhancements. Current efforts are focused on the development of a frozen liquid product format, which, if successful, will make significant improvements in end-user convenience.

*Products for Orthopedic Indications*

We have a regenerative medicine orthopedic program that is a collaboration between our subsidiary OrthoCyte Corporation ("OrthoCyte"), and Heraeus Medical GmbH. The companies are developing innovative bone grafting therapies to address difficult to heal and/or compromised bone fractures based on the use of our proprietary *PureStem*® human embryonic progenitor cell ("hEPC") technology.

***Product Candidates of Public Affiliates***

BioTime has retained a significant, non-strategic equity interest in two public companies that were founded by BioTime, Asterias, and OncoCyte are focused on neurology, oncology and diagnostics. As of March 9, 2017, the combined value of these holdings was approximately $146 million.

<u>Therapeutic Products in Neurology and Oncology</u>

Asterias is presently focused on advancing three clinical-stage programs, which have the potential to address areas of very high unmet medical need in the fields of neurology and oncology. Asterias' lead products are:

- *AST-OPC1* is a therapy derived from pluripotent stem cells that is currently in a Phase I/IIa clinical trial for spinal cord injuries, with positive early efficacy data reported in September 2016.

- *AST-VAC1* is a patient-specific cancer immunotherapy with promising Phase II clinical trial data in acute myeloid leukemia ("AML").

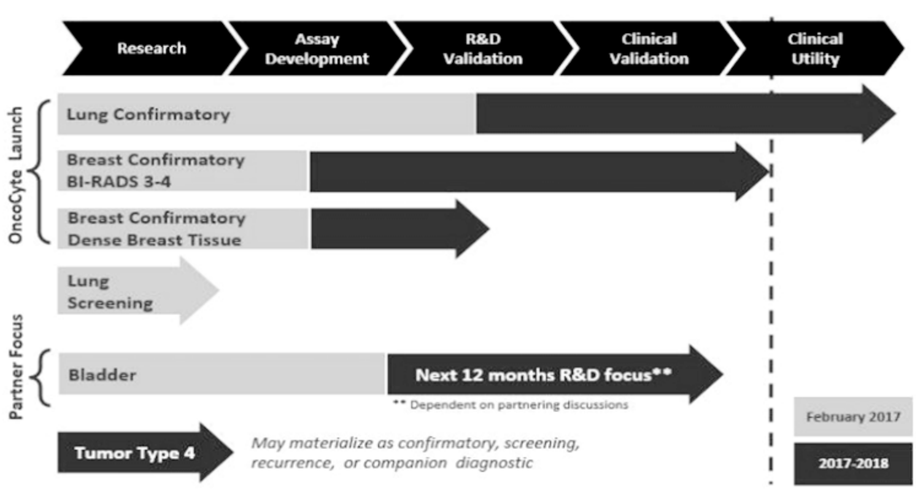
- *AST-VAC2* is a non-patient specific cancer immunotherapy for which the initiation of a Phase I/IIa clinical trial in non-small cell lung cancer is planned for the first half of 2017.

| PROGRAM | PRECLIN | PHASE 1 | PHASE 2 | PHASE 3 | STATUS |
|---|---|---|---|---|---|
| **AST-OPC1*** Spinal Cord Injury (subacute) Potential for application in advanced MS, stroke | Phase 1/2a in progress; positive data presented 9/2016 and 1/2017 | | | | Ph 1/2a ongoing CIRM |
| **AST-VAC1**** Leukemia (AML) Autologous Potential in multiple cancer types/stages as well as combination therapy | Process development in progress | | | | Process development & enhancement in progress |
| **AST-VAC2**** Lung Cancer Allogeneic Potential in multiple cancer types/stages as well as combination therapy | Phase 1/2a first patient to be enrolled H2 2017 | | | | Ph 1/2a First patient to enroll H2 2017 CANCER RESEARCH UK |

<u>Liquid Biopsies for Diagnosis of Cancer</u>

Our affiliate OncoCyte is developing confirmatory diagnostic tests for lung cancer, breast cancer, and bladder cancer utilizing novel liquid biopsy technology. While current biopsy tests use invasive surgical procedures to provide tissue samples to determine if a tumor is benign or malignant, OncoCyte is developing a next generation of diagnostic tests that will be based on liquid biopsies using blood or urine samples.

OncoCyte recently conducted a 300-patient study of its lung cancer test. On March 6, 2017 OncoCyte announced the successful completion of the study.



***Early-Stage and Other Research and Development***

We are also developing technology related to an exciting area of regenerative medicine relevant to diseases of aging. This technology, known as "induced Tissue Regeneration" or "iTR," may provide a new means of treating diseases caused by the degeneration of tissues. In 2016, our Co-Chief Executive Officer, Dr. Michael West, Ph.D., presented data generated from iTR. We are also developing technologies related to metabolic disorders based on the properties of brown fat, and therapies for vascular diseases, defects, and disorders. We also have several other early stage programs including our *PureStem*® cell therapy assets.

As part of our simplification strategy, we are looking at ways to attempt to unlock potential shareholder value associated with our early stage programs and the unique skills of Dr. West. One option under consideration is the consolidation of these early stage assets under the leadership of Dr. West.

We are also exploring other ways to fund these early stage opportunities that is consistent with our focus on clinical progress.

**Strategy**

We are transitioning BioTime into a clinical and commercial-ready company. Our near-term focus is to achieve three primary objectives:

***Clinical Progress***

Our efforts are focused on progressing our therapeutic products through clinical development. Our organizational capabilities are being aligned to execute on this objective to better position us to design, execute and oversee trials, with the goal of generating significant value-creating data in the near-term, and enabling future commercialization. Clinical progress success will allow the company to create greater value for investors, as well as allow us to better resource several other programs that are based on our core technologies.

***Simplification***

We will continue to work on simplifying our corporate, financial and organizational structure to allow us to execute our objectives more efficiently, while also making it much easier for investors, and other external stakeholders, to better understand our company.

***Unlocking value***

Our purpose is to deliver therapies for significant unmet, or under-met, needs to patients, while creating value for our investors. We believe that we have several valuable assets within the BioTime Family of Companies. We have been successful in unlocking the value of these assets through the execution of various strategies, including partnering, or sale, of non-core assets, creation of companies, spin-outs, distributions, simplification actions and other tactics we may develop.

**2016 Highlights**

The BioTime Family of Companies achieved numerous strategic accomplishments during 2016, including advancing clinical trials and product development in several key programs.

***Clinical Progress***

- We presented positive early *Renevia*® data at the International Federation for Adipose Therapeutics and Science meeting (IFATS) meeting in November. The data related to the treatment of the initial 9 run-in patients for BioTime's ongoing pivotal clinical trial in Europe assessing the efficacy of *Renevia*® for the treatment of HIV-associated lipoatrophy. In December, we achieved the recruitment milestone of 50 patients enrolled in the trial. We plan to stop enrollment in the trial in the first half of 2017 and to file for EU CE marking in the second half of 2017.

- We presented positive early *OpRegen*® data at the International Symposium on Ocular Pharmacology and Therapeutics (ISOPT) in December. The data from the first cohort in the Phase I/IIa clinical trial of *OpRegen*® in the advanced form of dry age-related macular degeneration (dry-AMD). By end of year 2017, some 1-year follow-up of cohort 2 and data from cohort 3 and beginning enrollment of cohort 4 are expected to be completed. *OpRegen*® has received Fast Track designation from the FDA.

- Initial feasibility of our next-generation retinal restoration technology demonstrates engraftment of laboratory grown three-dimensional laminated human retinal tissue and functional recovery of blind rats, which was described in three presentations at the annual meeting of the Society for Neuroscience in November 2016 in San Diego by Dr. Igor Nasonkin, lab head at BioTime and at a presentation at the ISSCR congress in Basel Switzerland in February 2017.

- In November 2016, Asterias successfully administered the highest dose of 20 million cells of AST-OPC1 to a patient with complete cervical spinal cord injury (SCI) as part of the SCiStar Phase I/IIa clinical trial. In January 2017, Asterias announced positive efficacy results that showed additional motor function improvement at 6-months and 9-months following administration of 10 million AST-OPC1 cells in 6 AIS-A patients with complete cervical SCI. The results suggest that the improvements in arm, hand and finger function observed earlier in the study have been maintained and even further enhanced over time in most patients. Twelve-month efficacy and safety data for this cohort, as well as 6-month efficacy and safety data for the currently-enrolling AIS-A 20 million cell and AIS-B 10 million cell cohorts are expected during the third quarter of 2017. Asterias also plans to initiate discussions with the FDA in mid-2017 to determine the most appropriate clinical and regulatory path forward for AST-OPC1.

- On March 6, 2017, in relation to its blood-based diagnostic test designed to aid physicians in the early detection of lung cancer, OncoCyte announced the successful completion of a study of 300 blood samples from patients with lung nodules that had been determined to be malignant or benign, and that it has locked the prediction algorithm of the test. Based on the study results, OncoCyte announced that it will begin ramping-up its commercial capabilities in anticipation of the potential commercial launch of the test. OncoCyte will initiate a clinical validation phase for the diagnostic. During this phase, OncoCyte will also continue to carry out analytical validation studies to refine its operational stage laboratory processes, and will apply for certification of its CLIA diagnostic testing lab. Upon CLIA certification, OncoCyte will conduct a small CLIA lab validation study to demonstrate that the full assay system utilized in the CLIA lab provides the same results on clinical samples as those obtained in the R&D lab. OncoCyte will then begin a clinical validation study on a new set of at least 300 blinded prospectively collected blood samples to confirm whether the sensitivity and specificity of the test remain within commercial parameters in a CLIA operational setting. Assuming successful completion of these steps, OncoCyte anticipates launching the test commercially in the second half of 2017.

- OncoCyte presented data from an early study of the OncoCyte's breast cancer test in a poster session at the 2016 San Antonio Breast Cancer Symposium (SABCS) in December. In January 2017, OncoCyte announced commencement of a 300-patient study for their breast cancer diagnostic test which is designed to replicate the successful findings from the earlier study. OncoCyte expects to complete this 300-patient study during mid-2017.

***Simplification***

- In May 2016, Asterias' financial statements were deconsolidated from BioTime's consolidated financial statements. The deconsolidation was a result of Asterias' successful completion of an equity financing, which brought our ownership in Asterias to below 50%. Although our financial statements no longer include Asterias' assets, liabilities or financial results, the value and changes in value of our shares of Asterias common stock will be reflected in our financial statements, which we believe will simplify our financial statements and may help investors better understand the financial performance and condition of BioTime's operations. GAAP requires the consolidation of 100% of a majority-owned subsidiaries' financials and results of operations even if the parent owns only a little over 50%.

- Similarly, as a result of the exercise of certain OncoCyte warrants held by certain OncoCyte investors, in February of 2017 OncoCyte's financials were deconsolidated from BioTime's consolidated financial statements. This deconsolidation is not reflected in this Report, but was reported in a Form 8-K that was filed on February 21, 2017, and will be reflected in BioTime's future quarterly and annual consolidated financial statements to be filed with the Securities and Exchange Commission (the "SEC").

***Unlocking Value***

- On January 4, 2016, OncoCyte shares were listed and began trading "regular way" on the NYSE MKT under the symbol OCX. This event triggered enhanced liquidity for BioTime shareholders who received one share of OncoCyte for every 20 shares of BioTime as a dividend at the end of 2015.

*Patent Portfolio*

- During 2016, the BioTime Family of Companies collectively had 44 new patents issued worldwide.

*Non-dilutive Funding*

- In 2016, our subsidiary, Cell Cure Neurosciences Ltd. ("Cell Cure"), was awarded a grant of 8.4 million shekels (approximately $2.2 million) from the Israel Innovation Authority, or the IIA (formerly the Office of the Chief Scientist of Israel) of the Ministry of Economy and Industry to help finance the development of *OpRegen*®. This brings the total grants received to date to approximately $9 million.

*Other Company News*

- In June 2016, we raised $20.1 million gross proceeds from new and previous investors in an underwritten public offering of our common shares.

**The BioTime Family of Companies (Affiliates & Subsidiary Ownership)**

The following table shows the operating companies within the BioTime Family of Companies, their respective principal fields of business, our percentage ownership, directly and through subsidiaries, as of December 31, 2016, and the country where their principal business is located:

| Subsidiaries and Affiliates | Field of Business | BioTime Ownership | Country |
|---|---|---|---|
| Cell Cure Neurosciences Ltd. | Products to treat age-related macular degeneration | 62.5%(1) | Israel |
| ES Cell International Pte. Ltd. | Stem cell products for research, including clinical grade cell lines produced under cGMP | 100% | Singapore |
| LifeMap Sciences, Inc. | Biomedical, gene, disease, and stem cell databases and tools | 77.9% | USA |
| OncoCyte Corporation (2) | Cancer diagnostics | 51.1% | USA |
| OrthoCyte Corporation | Developing bone grafting products for orthopedic diseases and injuries | 100% | USA |
| ReCyte Therapeutics, Inc. | Research and development involved in stem cell-derived endothelial and cardiovascular related progenitor cells for the treatment of vascular disorders, ischemic conditions and brown adipocytes for type-2 diabetes and obesity | 94.8% | USA |
| Asterias Biotherapeutics, Inc.(3) | Therapeutic products derived from pluripotent stem cells, and immunotherapy products. Clinical programs include: AST-OPC1 for spinal cord injury, AST-VAC1 for acute myelogenous leukemia, and AST-VAC2 for non-small cell lung cancer | 46% | USA |

(1) Includes shares owned by BioTime and ES Cell International Pte. Ltd. Does not include shares that would be owned by BioTime, if BioTime were to convert certain convertible debt into Cell Cure ordinary shares (see below for an explanation).

(2) See Note 16 to our consolidated financial statements included elsewhere in this Report. Beginning February 17, 2017, BioTime deconsolidated OncoCyte and OncoCyte is no longer a subsidiary of BioTime as of that date, but remains an affiliate and significant investee of BioTime.

(3) Since the deconsolidation of Asterias in May 2016, Asterias is a significant affiliate of BioTime.

<u>Our Ownership of Cell Cure</u>

We presently own, directly and through our subsidiary ES Cell International Pte. Ltd. ("ESI"), approximately 62.5% of the outstanding ordinary shares of Cell Cure. We also hold certain Cell Cure convertible promissory notes that entitle us to acquire additional Cell Cure ordinary shares by converting those notes into ordinary shares. If we were to convert the convertible promissory notes into Cell Cure ordinary shares, and if no other ordinary shares are issued to third parties, our percentage ownership of Cell Cure would increase to 82.3%, based on the number of ordinary shares outstanding on February 28, 2017. Cell Cure has adopted stock option plans under which it may issue up to 125,363 of its ordinary shares to officers, directors, employees, and consultants. As of December 31, 2016, options to purchase 80,986 ordinary shares of common stock had been granted.

We and ESI entered into a Third Amended and Restated Shareholders Agreement with Cell Cure and its other principal shareholders Teva Pharmaceutical Industries, Ltd., ("Teva") and Hadasit Bio-Holdings Ltd ("HBL") pertaining to certain corporate governance matters and rights of first refusal among the shareholders to purchase on a pro rata basis any additional shares that Cell Cure may issue. Under the agreement, the shareholders also granted each other a right of first refusal to purchase any Cell Cure shares that they may determine to sell or otherwise transfer in the future. The number of members on the Cell Cure board of directors is set at seven, of which we are entitled to elect four directors, HBL is entitled to elect two directors, and Teva is entitled to elect one director. These provisions were also included in an amendment to Cell Cure's Articles of Association.

To date, Cell Cure has received grants totaling approximately $9 million from the IIA for the development of *OpRegen*®. Under the terms of the grant agreement between Cell Cure and IIA, Cell Cure will be required to pay royalties on future product sales, if any, up to the amounts received from the IIA, plus interest indexed to LIBOR. Israeli law pertaining to such government grants contain various conditions, including substantial penalties and restrictions on the transfer of intellectual property, or the manufacture, or both, of products developed under the grant outside of Israel, as defined by the IIA.

*Our Ownership of Asterias*

As of March 9, 2017, we owned 44.5% of the outstanding Asterias common stock. Asterias common stock is listed for trading on the NYSE MKT under the symbol AST. Asterias has adopted an Equity Incentive Plan under which Asterias has reserved 8,000,000 shares of common stock for the grant of stock options, and other equity-based awards to officers, directors, employees, and consultants. As of December 31, 2016, Asterias had outstanding warrants to purchase 6,552,479 shares of Asterias common stock, options to purchase a total of 6,065,938 shares of Asterias common stock and 52,509 restricted stock units.

*Our Ownership of OncoCyte*

On December 31, 2015, we distributed to our shareholders on a pro rata basis a portion of the shares of OncoCyte common stock we then owned. As of March 9, 2017, we owned 49.98% of the OncoCyte common stock outstanding. OncoCyte common stock is listed for trading on the NYSE MKT under the symbol OCX. OncoCyte has adopted a stock option plan under which it may issue up to 4,000,000 shares of its common stock to officers, directors, employees, and consultants of OncoCyte. As of December 31, 2016, options to purchase 3,017,087 shares of OncoCyte common stock had been granted.

*Our Ownership of OrthoCyte*

As of March 9, 2017, we owned 99.99% of the outstanding common stock of OrthoCyte. OrthoCyte has adopted a stock option plan under which it may issue up to 4,000,000 shares of its common stock to officers, directors, employees, and consultants of OrthoCyte and BioTime. As of December 31, 2016, options to purchase 1,300,000 shares of OrthoCyte common stock had been granted.

*Our Ownership of ReCyte Therapeutics*

As of March 9, 2017, we owned 94.8% of the ReCyte Therapeutics common stock outstanding. Two private investors and a foundation own the other shares of ReCyte Therapeutics common stock outstanding. ReCyte Therapeutics has adopted a stock option plan under which it may issue up to 4,000,000 shares of its common stock to officers, directors, employees, and consultants of ReCyte Therapeutics and BioTime. As of December 31, 2016, options to purchase 1,250,000 shares of ReCyte Therapeutics common stock had been granted.

*Our Ownership of LifeMap Sciences*

As of March 9, 2017, we owned 77.9% of the LifeMap Sciences, Inc. ("LifeMap Sciences") common stock outstanding. Certain current and former officers and directors of LifeMap Sciences and other investors own the other shares of LifeMap Sciences common stock outstanding. LifeMap Sciences has adopted a stock option plan under which it may issue up to 2,342,269 shares of its common stock to officers, directors, employees, and consultants of LifeMap Sciences and BioTime. As of December 31, 2016, options to purchase 1,596,123 shares of LifeMap Sciences common stock had been granted.

**Additional Information**

BioTime is incorporated in the State of California. Our common shares trade on the NYSE MKT and the Tel Aviv Stock Exchange ("TASE") under the symbol "BTX." Our principal executive offices are located at 1010 Atlantic Avenue, Suite 102, Alameda, CA 94501, and our phone number at that address is (510) 521-3390. Our website address is www.biotimeinc.com. The information on, or that can be accessed through our website is not part of this Report. We also make available, free of charge through our website, our most recent annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and any amendments to those reports, as soon as reasonably practicable after the reports are electronically filed with or furnished to the Securities and Exchange Commission (the "SEC").

*HyStem*®, *Hextend*®, *PureStem*® and *Renevia*® are registered trademarks of BioTime, Inc., and *ReGlyde*™ and *Premvia*™ are trademarks of BioTime, Inc. *ReCyte*™ is a trademark of ReCyte Therapeutics, Inc. *OpRegen*® is a registered trademark of Cell Cure. *GeneCards*® is a registered trademark of Yeda Research and Development Co. Ltd. *LifeMap Discovery*® is a registered trademark of LifeMap Sciences.

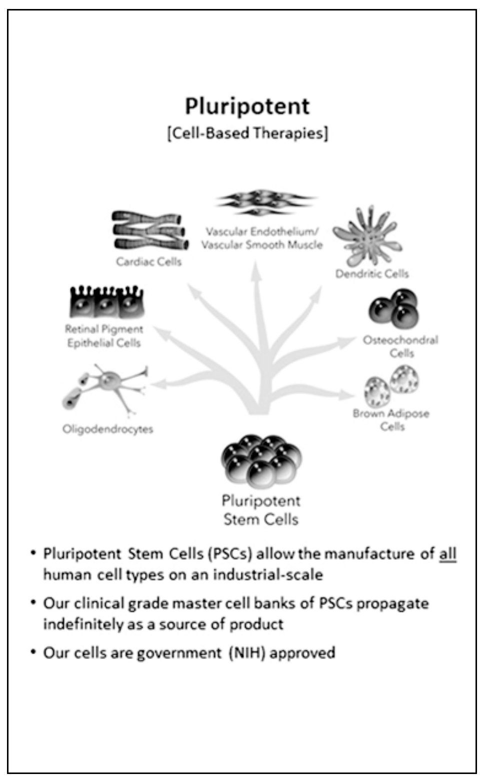
In 2016, BioTime was led by the Co-CEO leadership team of Adi Mohanty, who is responsible for human clinical development, product commercialization, corporate and administrative functions and Dr. Michael D. West, one of the world's foremost experts on therapies derived from stem cells, who is responsible for research, product discovery, and preclinical product development.

To efficiently advance product candidates through the clinical trial process, we have historically created operating subsidiaries for each program and product line. Management believes this approach has fostered efficient use of resources and reduced shareholder dilution as compared to strategies commonly deployed by the biotechnology industry in advancing various programs and product lines through development. However, the operation of our business through multiple subsidiaries and affiliated companies results in certain administrative expenses that we would not incur if all our operations were conducted within BioTime itself. Because of this organizational structure which has facilitated our fundraising efforts, the BioTime Family of Companies has developed multiple clinical-stage products, rather than being dependent on a single product program. We, and some of the other members of the BioTime Family of Companies, have also received substantial amounts of non-dilutive financial support from government and nonprofit organizations that are seeking, based on rigorous scientific review processes, to identify and accelerate the development of potential breakthroughs in the treatment of various major diseases.

**Technology Platforms**

***Pluripotent Cell Technology:***

BioTime believes that it and its subsidiaries and affiliates have the world's premier collection of pluripotent cell assets. Pluripotent cells, which are capable of becoming any of the cell types of the human body, have potential applications in many areas of medicine with large unmet patient needs, including various age-related degenerative diseases and degenerative conditions for which there are presently no cures. Unlike pharmaceuticals that require a molecular target, therapeutic strategies based on the use of pluripotent cells are generally aimed at regenerating or replacing affected cells and tissues, and therefore may have broader applicability than pharmaceutical products.

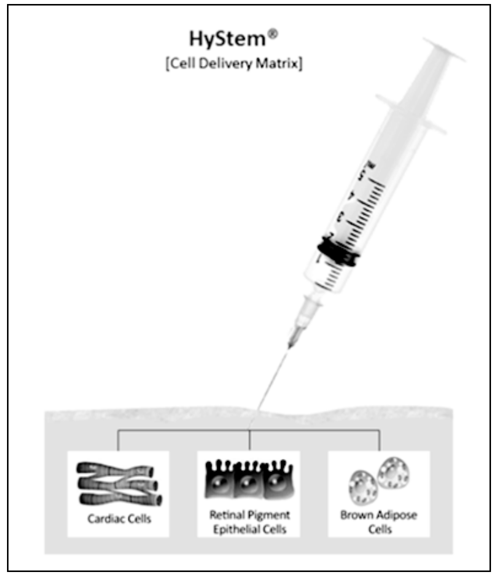



BioTime has two key pluripotent platforms, PureStem® and ESI pluripotent stem cell lines. PureStem® human Embryonic derived Progenitor Cells (hEPC) address significant challenges in regenerative medicine through their purity, proliferative capacity and ability to better predictably acquire tissue specificity or "differentiate," into a broad spectrum of cell types in a simplified and controlled fashion. These advantages allow the production, on a commercial scale, of pure cultures of potentially therapeutic cell types that do not contain uncharacterized "undifferentiated" cell types. The ESI pluripotent stem cell lines are the first clinical grade human embryonic stem cell lines and they were derived under current Good Tissue Practice (cGTP) conditions. They are NIH-registered and are among the best-characterized and documented human stem cell lines available today, with complete genome sequence, STR-fingerprint and HLA-type data available.

### ***HyStem® Delivery Technology:***

*HyStem®* is a patented biomaterial that mimics the extracellular matrix ("ECM"), the structural network of molecules surrounding cells in organs and tissues that is essential to cellular function. Many tissue engineering and regenerative cell-based therapies will require the delivery of therapeutic cells in a matrix or scaffold for accurate anatomical delivery, cell retention and engraftment, guided tissue remodeling and proper function. *HyStem®* is a unique hydrogel that has been shown to support cellular attachment and proliferation *in vivo*. Current research at leading medical institutions has shown that *HyStem®* is compatible with a wide variety of cells and tissue types including brain, bone, skin, cartilage, and vascular and heart tissues.

The patented technology underlying our *HyStem®* hydrogel products in development, such as *Renevia®* and *ReGlyde™*, was developed at the University of Utah and has been exclusively licensed to us for human therapeutic uses. The *HyStem®* technology is based on a unique thiol cross-linking chemistry to prepare hyaluronan-based hydrogels. Since the first published report in 2002, there have been over 150 academic scientific publications supporting the biocompatibility of thiol cross-linked hyaluronan-based hydrogels and their applications as medical devices and in cell culture, tissue engineering, and animal models of cell-based therapies.

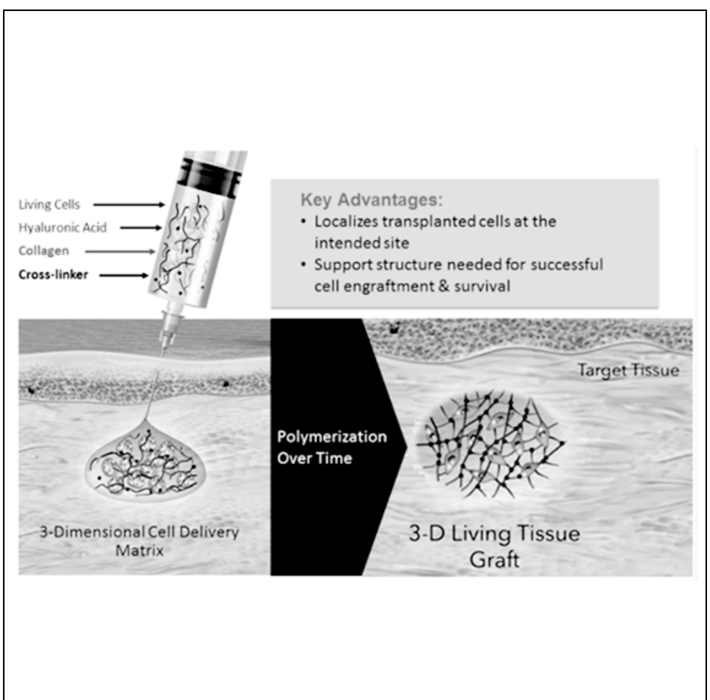



Due to the unique cross-linking chemistry, *HyStem®* hydrogels can be injected or applied as a liquid which allows the hydrogel to conform to the cavity or space, and gelation occurs *in situ* without harming the recipient tissue. This property of *HyStem®* hydrogels offers several distinct advantages over other hydrogels, including the possibility of combining bioactive materials with the hydrogel at the point of use. Building upon this platform, we are developing the *HyStem®* family of unique, biocompatible resorbable hydrogel products.

**Therapeutic Product Candidates Being Developed By BioTime**

***Facial Aesthetics***

*Renevia®*

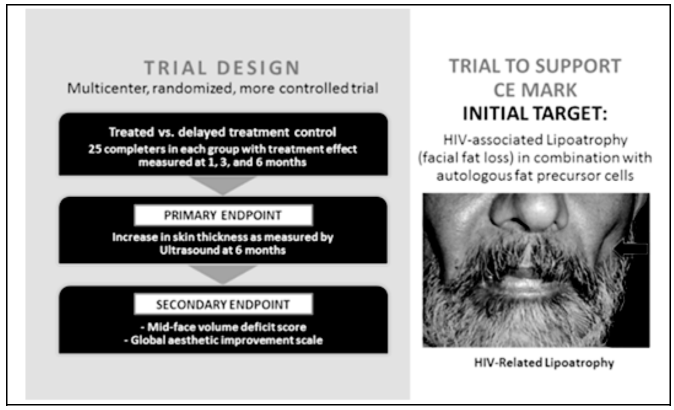


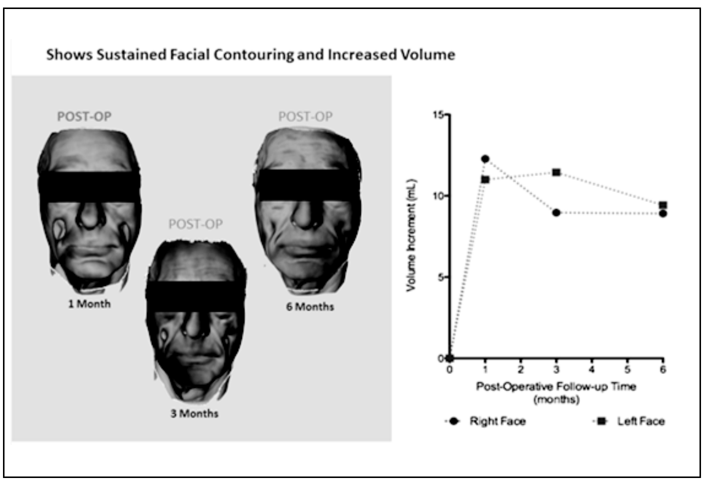

We are developing *Renevia®*, a clinical-grade *HyStem®* hydrogel, as an injectable product. *Renevia®* is being developed to address an immediate need in facial aesthetic procedures, and certain reconstructive surgeries, by improving the process of transplanting a patient's own fat progenitor cells to potentially provide a better looking, more natural feeling and longer lasting benefit.

Cells obtained from a patient, such as adipose cells obtained through liposuction, can be transplanted back into the same patient at another location in the body without the risk of rejection and potential contamination associated with the transplant of allogenic donor tissues. However, the transplantation of cells without the molecular matrix in which cells normally reside often leads to widespread cell death or the failure of the transplanted cells to remain at the transplant site. The transfer of cells in *Renevia®* may resolve this issue by localizing the transplanted cells at the intended site and by providing a three-dimensional scaffold upon which cells can attach and rebuild normal tissue.

We are conducting a multi-site pivotal clinical study in Spain to assess the efficacy of *Renevia*® as a delivery matrix for fat progenitor cells to restore normal skin volume in patients where the subcutaneous adipose tissue has been lost to HIV related facial lipoatrophy. Lipoatrophy is a localized loss of fat beneath the skin and is most frequently a consequence of the normal aging process, but lipoatrophy can also be associated with trauma, surgery, drug side effects and diseases. Lipoatrophy is frequently experienced by HIV patients who have been treated with certain anti-retroviral drugs like Stavudine and Zidovudine. The resulting facial wasting ages the individual's appearance prematurely and, along with a thinning of the skin, allows musculature and vasculature to be easily seen, resulting in what is commonly known as "the face of AIDS". Treatment of the condition improves the individual's self-esteem and quality of life.

The pivotal clinical study design includes a minimum of 56 and up to 92 HIV positive males and females between 18-65 years of age. Subjects will be randomized with half in a treatment group and half in a delayed-treatment cohort, each receiving a single treatment procedure of *Renevia*® with autologous adipose cells harvested by liposuction and implanted in the mid-facial region. Patients are being monitored at one, three, and six-month intervals after treatment.




Data from the run-in portion of the study (N=9) indicated that adipose progenitor cells (fat cells), obtained from a liposuction aspirate, remained viable and were observed to proliferate when combined with *Renevia*® hydrogel. Analysis suggests that the grafts retain volume over the assessment period, and the treating physician observed incremental volume was retained in patients who had progressed to the one-year follow-up evaluation. In addition, there were encouraging signs of new tissue regeneration observed. No serious adverse events were noted during the run-in portion of the study.

*Renevia*® is manufactured in the US in compliance with cGMP requirements and has been tested pursuant to ISO 10993 standards for implantable medical devices and shown to be biocompatible without adverse effects in animal studies. Our plan is to complete the pivotal trial during the first half of 2017 and file for EU CE marking at the end of 2017. While this pivotal trial will enable a European filing for marketing authorization, we plan to use this trial to support US development of *Renevia*® for multiple forms of facial lipoatrophy, whether from drugs, trauma or aging. Once we analyze the data for the study, we plan to continue our discussion with the FDA regarding a potential development plan for *Renevia*® in the U.S.

***Ophthalmology***

*OpRegen*®

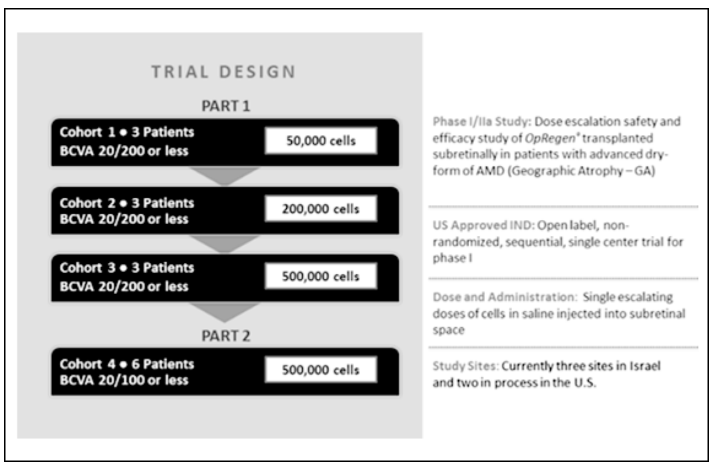
Our lead ophthalmology product, *OpRegen*®, is derived from pluripotent cell technology. It is currently in a Phase I/IIa clinical trial for the treatment of the dry form of age-related macular degeneration ("AMD"). Cell Cure, which is BioTime's subsidiary in Israel, is conducting the current clinical trial. *OpRegen*® is a proprietary formulation of retinal pigmented epithelial ("RPE") cells developed to be transplanted into the patient's eye, where the patient's own RPE cells are missing. *OpRegen*® consists of animal product-free RPE cells with high purity and potency using a proprietary directed differentiated method. *OpRegen*® is formulated as a suspension of RPE cells. It was developed to address the high, unmet medical needs of people suffering from dry aged-related macular degeneration.

AMD affects approximately 1.6 million newly diagnosed people annually in the U.S and is the leading cause of blindness in people over the age of 60. Approximately 90 percent of AMD patients suffer from the dry form ("dry-AMD"), for which there are no FDA-approved therapies.


AMD is a major disease of aging and is the leading eye disease responsible for visual impairment of elderly persons in the US, Europe and Australia. AMD affects the macula, which is the part of the retina responsible for sharp, central vision that is important for facial recognition, reading and driving. There are two forms of AMD, the dry form and the wet form. The dry form or dry-AMD advances slowly and painlessly but may progress to geographic atrophy in which RPE cells and photoreceptors degenerate and are lost. Once the atrophy involves the fovea (the center of the macula), patients lose their central vision and may develop legal blindness. The U.S. Centers for Disease Control and Prevention estimate that about 1.8 million people in the U.S. have advanced-stage AMD, while another 7.3 million have an earlier stage of AMD and are at risk of vision impairment from the disease. Most people are afflicted with the dry form of the disease, for which there is currently no effective treatment. One of the most promising future therapies for age-related AMD is the replacement of the layer of damaged RPE cells that support and nourish the retina.

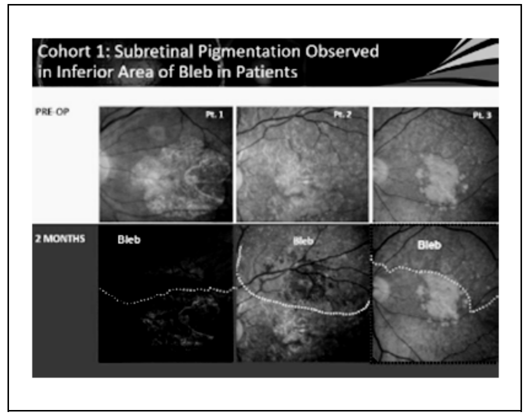
Preclinical studies in mice have shown that following a single subretinal injection of *OpRegen*® as a suspension of cells, the cells can rapidly organize into their natural monolayer structure and survive throughout the lifetime of the mice. *OpRegen*® is intended to be an "off-the-shelf" allogeneic product provided to retinal surgeons in an "easy to use" form for transplantation. Unlike other investigational treatments for dry-AMD and treatments for wet-AMD that require multiple, frequent injections into the eye, it is expected that *OpRegen*® would be administered in a single procedure, or once every several years.

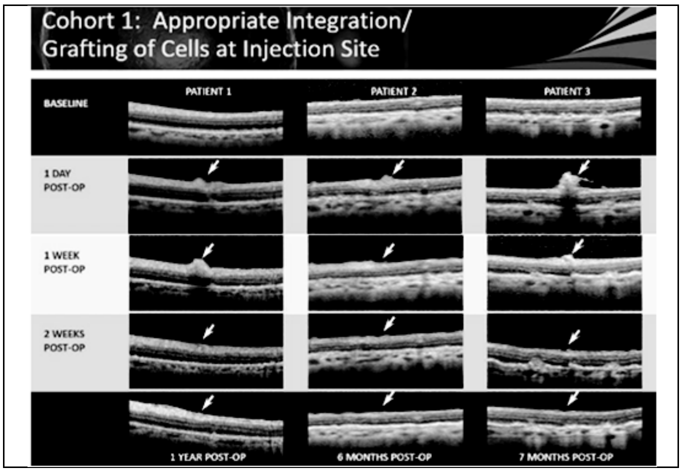
On February 16, 2015, the clinical trial entitled "Phase I/IIa Dose Escalation Safety and Efficacy Study of Human Embryonic Stem Cell-Derived Retinal Pigment Epithelium Cells Transplanted Subretinally in Patients with Advanced Dry-Form Age-Related Macular Degeneration with Geographic Atrophy" was initiated in Hadassah University Medical Center in Jerusalem. The primary objective of this trial is to evaluate the safety of three different dose regimens in the treatment of the advanced form of dry age-related macular degeneration (dry-AMD), a condition for which there is currently no FDA-approved therapy. The study will evaluate three different dose regimens of *OpRegen*® in four cohorts.




All patients enrolled in the study will be 50 years of age or older, with the advanced form of dry-AMD called geographic atrophy with absence of additional concomitant ocular disorders. The eye in which the disease has progressed the most will be treated, while the other eye will serve as a control. Following injection, the patients will be followed for 12 months at specified intervals, to evaluate the safety and tolerability of *OpRegen*®. Currently there are three study sites in Israel and two sites in the initiation process in the U.S. Enrollment in the second cohort, in which patients are receiving a higher and more clinically meaningful 200,000 cell dose started in 2016. Cell Cure intends to approach the DSMB in the second quarter of this year for approval to begin administering the next higher, 500,000 cell dose to the third cohort, and if approved, also begin the fourth cohort before year end. The most up-to-date data from patients in cohort 2 of the clinical trial will be presented May 7-11 at ARVO 2017 in Baltimore, Maryland.

Following the initial 12-month period, patients will continue to be evaluated at longer intervals for an additional period of time up to five years following injection. A secondary objective of the clinical trial will be to examine the ability of transplanted *OpRegen*® to engraft, survive, and modulate disease progression in the patients. In addition to thorough characterization of visual function, a battery of vision tests will be used to quantify improvements in reducing the progression of the disease. Research and development of the enabling technology of *OpRegen*® has been conducted at Hadassah Medical Organization (“Hadassah”), and the clinical development is being conducted by Cell Cure under an exclusive license from Hadasit Medical Research Services and Development Limited (“Hadasit”), which is the technology transfer office of Hadassah.




Data from the first cohort of patients were presented at the International Symposium on Ocular Pharmacology and Therapeutics (ISOPT) on Friday, December 2, 2016, in Rome, Italy. In this cohort, *OpRegen*® was successfully administered with no serious adverse events. Retinal imaging presented suggested the presence and survival of the transplanted cells in the sub-retinal space for up to one year.

Retinal Restoration

In February 2017, we acquired exclusive global rights to ophthalmology-related intellectual property assets from the University of Pittsburgh. The technology was developed, in part, in collaboration with BioTime scientists, and includes composition and methodologies to develop 3-D retinal tissue constructs from pluripotent stem cells for implantation in patients with advanced stages of retinal degeneration.

This technology will allow generation of three-dimensional laminated human retinal tissue in a controlled manufacturing process. This could lead to retinal restoration treatments for a variety of advanced retinal degenerative diseases, such as retinitis pigmentosa, macular degeneration, and diabetic retinopathy.

***Delivery***

*HyStem*®-BDNF

*HyStem®-BDNF* is a hydrogel-BDNF combination product made of our *HyStem*® delivery system with rhBDNF is in preclinical development for ischemic stroke. *HyStem®-BDNF* permits sustained local diffusion of BDNF into the peri-infarct tissue, currently in preclinical development for ischemic stroke. *HyStem®-BDNF* involves a proprietary formulation of the *HyStem*® hydrogel platform allowing a sustained release of BDNF, which is being developed to maximize tissue repair and recovery after neurological insult. Pre-clinical results indicate that when treating animals with focal stroke to motor areas of the brain, *HyStem®-BDNF* intra-stroke cavity injection results in BDNF diffusion from the stroke cavity into peri-infarct tissue over three weeks compared with one week for BDNF-only injection. The sustained release of BDNF in these animals is associated with improved post-stroke neurogenesis in the peri-infarct cortex, axonal sprouting in the motor system, and behavioral motor recovery.

*ReGlyde*™

*ReGlyde*™ is a proprietary formulation of the *HyStem*® hydrogel platform and is currently in preclinical development for viscosupplementation and drug delivery in osteoarthritis. Pre-clinical results are encouraging and have shown biocompatibility and preclinical efficacy signals in animal models.

*Research and Development and License Agreements with Heraeus Medical GmbH*

BioTime is developing cellular therapeutics for orthopedic disorders. During September 2015, we, through our subsidiary, OrthoCyte, entered into a License Agreement and a Research and Development Agreement with Heraeus Medical GmbH (“Heraeus”), for the development of innovative bone grafting therapies based on the use of our proprietary *PureStem*® human embryonic progenitor cell (hEPC) technology. Pursuant to the terms of the Research and Development Agreement, BioTime is responsible for research and development of a cell therapy bone grafting product using *PureStem*® technology and either *HyStem*® scaffold technology for delivery of bio-active components or scaffold technology owned by Heraeus or licensed to Heraeus from third parties.

BioTime is presently diligently developing bone grafting products for the Heraeus sponsored program. If sufficient funding becomes available, we may also test the utility of various osteochondral *PureStem*® cells that display potential to differentiate into cartilage-like tissues, such as intervertebral disc tissue. Cartilage defects and disease affect our aging population, and in particular osteoarthritis and spinal disc degeneration have a significant impact on the mobility and health of an aging population. Chronic back pain is one of the largest unmet health economic burdens in modern society. With more than 85% lifetime prevalence, nearly everyone is affected in their lifetime. In most cases, chronic back pain stems from the progressive degeneration of the avascular intervertebral disc tissue that cushions the vertebrae in the spinal column. This tissue is structurally and functionally similar to other cartilage tissues. Currently there are no treatment options for people suffering from degenerative disc disease other than risky invasive surgery to fuse the affected discs. A therapy that would slow down or reverse disc degeneration to delay or avoid surgery would have a great impact in the largest musculoskeletal unmet need. Various biologic approaches using growth factors or cells from different adult tissues are in various phases of preclinical and early clinical development, but so far none have proven to work effectively. The opportunity for BioTime to impact the disease process is an important differentiating factor from other competing technologies.

**Product Candidates of Public Affiliates**

***Therapeutic Products in Neurology and Oncology***

Asterias is presently focused on advancing three clinical-stage programs which have the potential to address areas of very high unmet medical need in the fields of neurology and oncology.

*AST-OPC1 Oligodendrocyte Progenitor Cells for Spinal Cord Injury and Other Neurodegenerative Diseases*

AST-OPC1 is comprised of oligodendrocyte progenitor cells, which are cells that become oligodendrocytes after injection. It has been shown preclinically to have 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.

AST-OPC1 was tested in patients with acute SCI in a Phase I and a Phase I/IIa dose escalation (“SCIStar study”) trials that were initiated in October 2010 and March 2015, respectively. In January 2017, Asterias announced additional interim efficacy data from the SCIStar study on the patients who were enrolled and dosed in the AIS-A 10 million-cell cohort, which included the following observations:

Improvements in Motor Function

- Upper Extremity Motor Score - For the five patients who had completed at least 6 months of follow-up at the time of the announcement, five of five patients saw their early improvements in upper extremity motor score (UEMS) at 3 months maintained or further increased through their most recent data point (6 months or 9 months, depending on the most recent data available for each patient).

- Motor Level Improvement - For patients completing at least 6 months of follow up, as of the date of each patient’s last follow-up visit, 100% (five of five) had achieved at least a one motor level improvement (using the ISNCSCI scale) over baseline on at least one side, and 40% (two of five) had achieved two motor levels over baseline on at least one side, with one of these patients achieving a two-motor level improvement on both sides.

Safety

- The trial results from the Phase I/IIa study continued to reveal a positive safety profile for AST-OPC1. There have been no serious adverse events related to AST-OPC1 and data from the study indicate that AST-OPC1 can be safely administered to patients in the subacute period after severe cervical spinal cord injury.

Asterias expects to complete enrollment of its Phase I/IIa study in the second half of 2017, with interim updates occurring at various times in 2017 and 2018.

There are approximately 17,000 new spinal cord injuries annually (NSCIC SCI Facts and Figures at a Glance (2016)). There are currently no drugs approved by the United States Food and Drug Administration (“FDA”) specifically for the treatment of spinal cord injury. The FDA has granted Orphan Drug Designation of AST-OPC1 for the treatment of acute SCI.

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

AST-VAC1 is an Asterias' autologous (patient-specific) cancer vaccine designed to stimulate a patient's immune system to attack telomerase. Asterias is developing AST-VAC1 for the treatment of Acute Myeloid Leukemia ("AML"), the most common form of acute leukemia in adults. A Phase II clinical trial of AST-VAC1 was conducted and demonstrated that AST-VAC1 was successfully manufactured and released in 24 out of the 33 patients enrolled in the study. Twenty-one patients received AST-VAC1 in the study, including 19 in clinical remission and two in early relapse. AST-VAC1 was found to have a favorable safety and tolerability profile. Asterias has performed follow-up data collection on the 19 patients who were treated while in complete remission to determine the long-term effects of the AST-VAC1 administration on remission duration and disease-free survival. The results of this data collection were reported in an oral presentation in May 2015. 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. Asterias has conducted an End of Phase II meeting with the FDA with the goal of reviewing the proposed clinical development plan for AST-VAC1.

The next major step in clinical development for AST-VAC1 would be to conduct a confirmatory Phase 2b study in higher risk patients over 60 years old.

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

AST-VAC2 is being developed by Asterias as an allogeneic, or non-patient specific, cancer vaccine candidate designed to stimulate patient immune responses to telomerase. AST-VAC2 is produced from human embryonic stem ("hES') cells that can be modified with any antigen. In September 2014, Asterias entered into a Clinical Trial and Option Agreement (the "CRUK Agreement") with Cancer Research UK ("CRUK") and Cancer Research Technology Limited, ("CRT"), a wholly-owned subsidiary of CRUK, pursuant to which CRUK has agreed to fund Phase I/II clinical development of AST-VAC2 loaded with the same LAMP-telomerase construct used in AST-VAC1. Under the terms of the CRUK Agreement, Asterias is responsible, at their own cost, for completing process development and manufacturing scale-up of the AST-VAC2 manufacturing process and transferring the resulting cGMP-compatible process to CRUK. CRUK is responsible, at its own cost, for manufacturing clinical grade AST-VAC2 and for carrying out the Phase I/IIa clinical trial of AST-VAC2. The Asterias technology transfer to CRUK has been completed and patient enrollment for this study is expected to begin in the second half of 2017.

**Liquid Biopsies for Cancer Diagnostics**

OncoCyte is developing diagnostic tests for lung cancer, breast cancer, and bladder cancer utilizing novel liquid biopsy technology. While current biopsy tests use invasive surgical procedures to provide tissue samples to determine if a tumor is benign or malignant, OncoCyte is developing highly accurate, easy to administer, non-invasive molecular diagnostic tests that will be based on liquid biopsies using blood or urine samples.

*Clinical Trials-Lung Cancer Diagnostic*

OncoCyte collaborated with the Wistar Institute of Anatomy and Biology ("Wistar") to develop one of the components of the confirmatory lung cancer diagnostic test in a large, multi-site clinical study. This collaboration involved a clinical study with over 2,000 blood samples obtained from patients with a high-risk profile for development of lung cancer, which led to the discovery of biomarkers that differentially express in lung cancer patients.

Confirmatory diagnostics are used in conjunction with a current standard of care screening procedure. A lung confirmatory diagnostic would be used in conjunction with Low Dose CAT Scan (LDCT) to confirm a suspicious nodule by yielding a secondary suspicious versus benign result. In the case of a benign result, the patient would not need additional invasive procedures to determine the presence of cancer. In the case of a suspicious result, additional procedures would be highly warranted.

In October of 2016, Wistar presented a larger proof of concept study at the Chest annual meeting, where it validated the results of the ATS study with comparable findings. In this larger analysis of 610 patients, showing that the biomarkers alone had an Area Under the Curve ("AUC" or "ROC score") of 0.82, resulting in a sensitivity of 90% and a specificity of 62%. These results suggest that a diagnostic comprised of biomarkers and a classifier could help clinicians manage the intermediate size nodules in way that would both improve health outcomes by potentially avoiding morbidity and mortality associated with lung biopsies, as well as decreasing the overall costs of lung cancer detection.

To provide independent validation of Wistar's work, OncoCyte elected to develop its own assay system and algorithm using the biomarkers identified by Wistar. OncoCyte collected its own clinical samples from 300 patients over 26 sites nationwide. The study was designed to provide a set of samples that were geographically diverse, from different types of care centers, and representing a cross-section of the high-risk patient population with nodules.

On March 6, 2017, OncoCyte announced the successful completion of the study and that it has locked the prediction algorithm of the test. Based on the study results, OncoCyte announced that it will begin ramping-up its commercial capabilities in anticipation of the potential commercial launch of the test. OncoCyte will initiate a clinical validation phase for the diagnostic. During this phase, OncoCyte will also continue to carry out analytical validation studies to refine its operational stage laboratory processes, and will apply for certification of its CLIA diagnostic testing lab. Upon CLIA certification, OncoCyte will conduct a small CLIA lab validation study to demonstrate that the full assay system utilized in the CLIA lab provides the same results on clinical samples as those obtained in the R&D lab. OncoCyte will then begin a clinical validation study on a new set of at least 300 blinded prospectively collected blood samples to confirm whether the sensitivity and specificity of the test remain within commercial parameters in a CLIA operational setting. Assuming successful completion of these steps, OncoCyte anticipates launching the test commercially in the second half of 2017.

*Clinical Trials—Breast Cancer Diagnostic*

OncoCyte completed a strong proof of concept study for its breast cancer confirmatory test, and presented data at the San Antonio Breast Cancer Symposium (SABCS) in December of 2016. The study looked at serum from 100 women who had a mammogram with a result of BIRADs 3 or 4. The results of this analysis were promising, with a 15-marker model producing a sensitivity of 90% and a specificity of 76%.

OncoCyte is continuing development of a breast cancer confirmatory diagnostic by conducting a larger study that it expects will analyze blood samples from approximately 300 patients with benign or malignant nodules.

*Clinical Trials—Bladder Cancer Diagnostic*

As part of the clinical development of a urine-based bladder cancer diagnostic test, OncoCyte initiated a clinical trial in January 2014 and in May of 2015, they presented preliminary findings of their bladder research, which showed a sensitivity of 90% and a specificity of 83%. Sensitivity is the probability of detecting the presence of the disease accurately. A sensitivity of 90% means that 9 out of 10 cancers were detected. Specificity is the probability of accurately predicting not having the disease. OncoCyte has decided to pursue a co-development partner for its bladder cancer test.

**Early-Stage and Other Research and Development**

***Treatment of Vascular Disorders***

We are using vascular cells derived from pluripotent stem cells, and other technologies, to develop treatments for vascular disorders. The therapeutic indications we are targeting include age-related cardiovascular diseases such as coronary artery disease, heart failure, and peripheral artery disease. Therapeutics for age-related vascular disease represent some of the largest, fastest-growing actual and potential markets in the U.S. due to the aging baby boom generation. Cardiovascular disease is among the leading causes of death and disability in the U.S., and consumes a major and ever-increasing proportion of health care costs. The National Academy of Sciences has estimated that a potential 58 million Americans are currently afflicted with cardiovascular disease. We are conducting this research through our subsidiary, ReCyte Therapeutics.

During August 2011, we entered into a License Agreement with Cornell University for the worldwide development and commercialization of technology developed invented by Dr. Shahin Rafii and co-workers at Weill Cornell Medical College for the differentiation of pluripotent stem cells into vascular endothelial cells. We are using the Cornell technology in combination with the *PureStem®* technology to produce highly purified monoclonal embryonic vascular endothelial progenitor stem cells.

**Brown Fat Technology for Treatment of Metabolic Disorders**

Brown adipose tissue (BAT) cells, or as they are sometimes called “brown fat cells,” have only recently become the subject of intense study by medical researchers. Unlike normal white adipose tissue (WAT) which is the fat we normally associate with obesity and disorders correlated with obesity such as Type II Diabetes (T2D), BAT cells don’t simply store calories. BAT cells burn calories in the process of generating body heat. In addition, the cells secrete biological active molecules that are believed to play an important role in maintaining the body in a state of metabolic health. Recently it has also been reported that humans lose BAT as a function of age and the loss of these cells are implicated in unhealthy age-related changes in metabolism such as obesity, T2D, and metabolic syndrome. This recent discovery may have important consequences for regenerative medicine, since pluripotent cells provide a means of manufacturing all human cell types on an industrial scale, including BAT cells. Our research team has invented a technology to manufacture BAT cells and filed certain patent applications that it believes provides it with a path to develop BAT cells for the potentially large and growing markets associated with obesity and T2D. Prior to initiating human clinical trials, we will be required to successfully perform extensive preclinical testing of the cells to determine their safety and efficacy in non-human model systems.

**iTR**

When tissues in the human body are damaged as a result of degenerative disease, injury, or surgery, there is generally a very limited capacity of the body to regenerate the tissue back to its original state. Exceptions to this rule is blood and the liver, both of which both show a remarkable capacity to restore equilibrium after the loss of cells. Other exceptions are tissues in the human body when it is first being formed. Early in development tissues such as the skin can repair itself scarlessly, but this ability is lost even before we are born. Another example in the animal kingdom is the Mexican salamander which shows a profound capacity to regenerate damaged tissues, even restoring severed limbs. However, in the adult human, most tissues simply scar rather than regenerate. Our scientists have been performing certain research to understand the molecular mechanisms regulating this loss of regenerative potential after the human body is formed based on its expertise in pluripotent stem cell technology. As a result, these scientists have invented a novel technology we call "induced Tissue Regeneration" or "iTR." iTR is designed to eventually facilitate the identification of therapies to induce scarless regeneration of tissues in the body that currently cannot naturally repair themselves. Examples of potential applications are numerous, but we are particularly focused currently on the regeneration of the heart following infection or heart failure, and scarless skin regeneration. iTR is a revolutionary new approach to medicine and as a result, the program will require us to communicate the science effectively to the scientific community and perform preclinical studies to demonstrate its safety and efficacy prior to any human clinical trials.

**Databases and Tools for Biomedical, Gene, Stem Cell, and Disease Research**

LifeMap Sciences is a life sciences technology company that offers biomedical knowledgebases and NGS data analysis & interpretation solutions. Its integrated knowledgebase, the *GeneCards®* Suite, includes *GeneCards®*, the leading human gene database, *LifeMap Discovery®* the database of embryonic development, stem cell research and regenerative medicine; and *MalaCards*™, the human disease database. Its NGS data analysis and interpretation tools includes TGex, a Next Generation Sequencing (NGS) cloud-based solution for interpretation, the analysis tools *VarElect*™, a powerful, yet easy-to-use application for prioritizing gene variants resulting from next generation sequencing experiments, and *GeneAnalytics*™, a novel gene set analysis tool. LifeMap Sciences makes its databases and analysis tools available for use by researchers at pharmaceutical and biotechnology companies and other institutions through paid subscriptions or on a fee per use basis. Academic institutions have free access to use the databases. The analysis tools are offered to academic users through paid subscriptions.

**Licensed Technology and Product Development Agreements**

BioTime and other members of the BioTime Family of Companies have obtained the right to use technology that we believe has great potential in our product development efforts, and that may be useful to other companies that are engaged in the research and development of products for human therapeutic and diagnostic use.

***Wisconsin Alumni Research Foundation—Research Products***

We have entered into a Commercial License and Option Agreement with Wisconsin Alumni Research Foundation ("WARF"). The WARF license permits us and our subsidiaries to use certain patented and patent pending technology belonging to WARF, as well as certain stem cell materials, for research and development purposes, and for the production and marketing of "research products" and "related products." "Research products" are products used as research tools, including in drug discovery and development. "Related products" are products other than research products, diagnostic products, or therapeutic products. "Diagnostic products" are products or services used in the diagnosis, prognosis, screening or detection of disease in humans. "Therapeutic products" are products or services used in the treatment of disease in humans.

We will pay WARF a 4% royalty on the sale of research products and services and 2% on the sale of related products under the WARF license. The royalty rate is subject to certain reductions if we also become obligated to pay royalties to a third party to sell a product. We have certain options to negotiate with WARF to obtain a license to manufacture and market therapeutic products, excluding products in certain fields of use. The WARF license shall remain in effect until the last licensed patent expires, however, we may terminate prior to the expiration by giving WARF at least 90 days written notice, and WARF has industry standard termination rights.

***PureStem® Technology***

ReCyte Therapeutics entered into a license agreement with Advanced Cell Technology, Inc., which later became Ocata Therapeutics, Inc. ("Ocata") that was subsequently assigned to us under which we acquired exclusive world-wide rights to use Ocata's technology for methods to accelerate the isolation of novel cell strains from pluripotent stem cells. The licensed rights include pending patent applications, know-how, and existing cells and cell lines developed using the technology.

The licensed technology is designed to provide a large-scale and reproducible method of isolating clonally purified human embryonic progenitor cells (“hEPCs”), many of which may be capable of extended propagation *in vitro*. Initial testing suggests that the technology may be used to isolate at least 200 distinct clones that contain many previously uncharacterized cell types derived from all germ layers that display diverse embryo- and site-specific homeobox gene expression. Despite the expression of many oncofetal genes, none of the hEPC tested led to tumor formation when transplanted into immunocompromised mice. The cells studied appear to have a finite replicative lifespan but have longer telomeres than most fetal- or adult-derived cells, which may facilitate their use in the manufacture of purified lineages for research and human therapy. Information concerning the technology was published in the May 2008 edition of the journal *Regenerative Medicine*.

We have the right to use the licensed technology and cell lines for research purpose and for the development of therapeutic and diagnostic products for human and veterinary use, and we also have the right to grant sublicenses. We paid Ocata a $250,000 license fee as well as an 8% royalty on sales of products, services, and processes that utilize the licensed technology. Once a total of $1.0 million of royalties has been paid, no further royalties will be due.

Ocata may reacquire royalty-free, worldwide licenses to use the technology for RPE cells, hemangioblasts, and myocardial cells, on an exclusive basis, and for hepatocytes, on a non-exclusive basis, for human therapeutic use. Ocata will pay us $5,000 for each license that it elects to reacquire.

The term of the licenses from Ocata expire on the later of July 9, 2028 or the expiration of the last to expire of the licensed patents. The latest expiration date of patents issued is October 12, 2026, but the expiration date of the licenses could be extended if the patent expiration dates are extended. Ocata may terminate the license agreement if we commit a breach or default in the performance of our obligations under the agreement and fail to cure the breach or default within the permitted cure periods. BioTime has the right to terminate the license agreement at any time by giving Ocata three months’ prior notice and paying all amounts due to Ocata through the effective date of the termination.

***HyStem® Hydrogel Technology***

We have acquired an exclusive worldwide license from the University of Utah to use certain patents in the production and sale of hydrogel products, including our *HyStem®* products, excluding certain veterinary and animal heath uses. Our licensed field of use includes, but is not limited to, all human pharmaceutical and medical device applications, all tissue engineering and regenerative medicine uses, and all research applications.

Under the License Agreement, we will pay a 3% royalty on sales of products and services performed that utilize the licensed patents. We are obligated to pay minimum royalties to the extent that actual royalties on products sales and services utilizing the patents are less than the minimum royalty amount. The minimum royalty amounts are $30,000 per annum during the term of the License Agreement. We will also pay the University of Utah 30% of any sublicense fees or royalties received under any sublicense of the licensed patents.

We will also pay a $225,000 milestone fee within six months after the first sale of a “tissue engineered product” that utilizes a licensed patent. A tissue engineered product is defined as living human tissues or cells on a polymer platform, created at a place other than the point-of-care facility, for transplantation into a human patient.

We agreed to pay and an additional license fee for the additional rights licensed to us during August 2012, and the costs of filing, prosecuting, enforcing and maintaining the patents exclusively licensed to us, and a portion of those costs for patents that have been licensed to a third party for a different field of use.

Commencing in August 2017, we may, under certain circumstances, be obligated to sublicense to one or more third parties, on commercially reasonable terms to be negotiated between us and each prospective sublicensee, or re-grant to the University of Utah, rights to use the licensed patents for products and services outside the general industry in which we or any of our affiliates or sublicensees is then developing or commercializing, or has plans to develop or commercialize, a product using the licensed technology.

***Research and Development Agreement and License Agreement with Heraeus***

OrthoCyte has entered into a License Agreement and a Research and Development Agreement with Heraeus for the development of innovative bone grafting therapies based on the use of our proprietary *PureStem®* human embryonic progenitor cell technology. Pursuant to the terms of the Research and Development Agreement, OrthoCyte will carry out a research and development project aimed at producing a cell therapy bone grafting product, using *PureStem®* technology and either *HyStem®* scaffold technology for delivery of bioactives, referred to as the OrthoCyte Technology, or scaffold technology owned by Heraeus or licensed to it by third parties, referred to as the Heraeus Technology. The OrthoCyte Technology includes technology owned by it or BioTime or licensed from third parties.

Under the terms of the Research and Development Agreement, Heraeus agreed to make certain payments to OrthoCyte upon achieving certain milestones, and will reimburse OrthoCyte for all costs and expenses incurred in connection with the project. The Research and Development Agreement is effective until the completion and payment of the last milestone set forth in the project plan, but may be terminated by either party immediately upon written notice to the other party if the other party fails to remedy any material breach of the agreement within 90 days following receipt of written notice of such breach. Heraeus had additional industry standard termination rights. OrthoCyte has also licensed the OrthoCyte Technology to Heraeus, and Heraeus has licensed the Heraeus Technology to OrthoCyte. The license grant by OrthoCyte to Heraeus is exclusive and worldwide in the field of bone grafting for all osteoskelton diseases and injuries, except oral maxilla-facial. The license grant by Heraeus to OrthoCyte is exclusive and worldwide in all other fields. Pursuant to the License Agreement, each of Heraeus and OrthoCyte will pay certain specified royalties to each other based on their respective net sales of the product developed in the research and development project. The License Agreement contains customary confidentiality obligations, and representations and warranties, and termination provisions.

***Hadasit Research and License Agreement***

Cell Cure has entered into an Amended and Restated Research and License Agreement with Hadasit under which it received an exclusive license to use certain of Hadasit's patented technologies for the development and commercialization for pluripotent stem cell-derived cell replacement therapies for retinal degenerative diseases. Cell Cure paid Hadasit 249,058 New Israeli Shekels as a reimbursement for patent expenses incurred by Hadasit, and pays Hadasit quarterly fees for research and product development services under a related Product Development Agreement.

If Cell Cure grants, subject to the terms of the Amended and Restated Research and License Agreement, a sublicense to any strategic partner comparable to Teva Pharmaceutical Industries Ltd. (a "Strategic Partner"), Cell Cure will pay Hadasit 30% of all sublicensing payments made by said Strategic Partner to Cell Cure, other than payments for research, reimbursements of patent expenses, loans or equity investments, provided that the minimum payments due to Hadasit in respect of amounts which constitute royalties based on sales of licensed products by the Strategic Partner, its affiliates or sublicensees shall not be less than 1.2% of the underlying net sales.

If Cell Cure does not grant a sublicense to a Strategic Partner but instead commercializes *OpRegen*® itself or sublicenses the Hadasit patents to a third party for the completion of development or commercialization of *OpRegen*®, Cell Cure will pay Hadasit a 5% royalty on sales of products that utilize the licensed technology. Cell Cure will also pay sublicensing fees ranging from 10% to 30% of any payments Cell Cure receives from sublicensing the Hadasit patents. Commencing in January 2017, Hadasit will be entitled to receive an annual minimum royalty payment of $100,000 that will be credited toward the payment of royalties and sublicense fees otherwise payable to Hadasit during the calendar year. If Cell Cure or a sublicensee other than a Strategic Partner paid royalties during the previous year, Cell Cure may defer making the minimum royalty payment until December and will be obligated to make the minimum annual payment to the extent that royalties and sublicensing fee payments made during that year are less than $100,000.

If Cell Cure does not grant a sublicense to a Strategic Partner and Cell Cure or a sublicensee (other than a Strategic Partner) conducts clinical trials of *OpRegen*®, Hadasit will be entitled to receive certain payments from Cell Cure upon the first attainment of certain clinical trial milestones in the process of seeking regulatory approval to market a product developed by Cell Cure using the licensed patents. Hadasit will receive $250,000 upon the completion of the enrollment of patients in the first Phase I clinical trial, $250,000 upon the submission of a report summarizing the Phase II clinical trial data to a regulatory agency as part of the approval process, and $1 million upon the enrollment of the first patient in the first Phase III clinical trial. These milestone payments are creditable by Cell Cure against sublicensing receipts that are payable to Hadasit at the time of each milestone payment for said milestone payment, except that the $1.0 million milestone payment shall only be creditable by Cell Cure if it received sublicensing receipts in excess of the amount of $50 million.

The Hadasit license agreement will automatically expire upon the later of (i) the expiration of all of the licensed patents or (ii) 15 years following the first sale of a product developed using a licensed patent on a country-by-country and product-by-product basis. After expiration of the license agreement, Cell Cure will have the right to exploit the Hadasit licensed patents without having to pay Hadasit any royalties or sublicensing fees. Either party may terminate the license agreement if the other party commits a breach or default in the performance of its obligations under the agreement and fails to cure the breach or default within the permitted cure periods.

***Cornell University***

During August 2011, we entered into a License Agreement with Cornell University for the worldwide, exclusive development and commercialization of technology developed at Weill Cornell Medical College for the differentiation of pluripotent stem cells into vascular endothelial cells. The technology may provide an improved means of generating vascular endothelial cells on an industrial scale, and will be utilized by us in diverse products, including those under development at our subsidiary ReCyte Therapeutics to treat age-related vascular disease. Cornell will be entitled to receive an initial license fee and annual license maintenance fees. The obligation to pay annual license maintenance fees will end when the first human therapeutic license product is sold by us or by any of our affiliates or sublicensees. We will pay Cornell milestone payments upon the achievement of a research product sales milestone amount, and upon the attainment of certain FDA approval milestones. We will pay Cornell royalties on sales of licensed products and will share with Cornell a portion of any cash payments, other than royalties, received for the grant of sublicenses to non-affiliates. The license will expire on the later of (i) the expiration date of the longest-lived licensed patent, or (ii) on a country-by-country basis, on the twenty-first anniversary of the first commercial sale of a licensed product. We have the right to terminate the License Agreement at any time and for any reason upon ninety (90) days written notice to Cornell. Cornell may terminate our license if we fail to perform, or if we violate, any term of the License Agreement, and we fail to cure that default within thirty (30) days after written notice from Cornell. Cornell also has other industry standard termination rights.

Cornell also may terminate the license or convert the exclusive license to a non-exclusive license if we fail to meet any of the following requirements: (i) diligently proceed with the development, manufacture and sale of licensed products; (ii) annually spend certain specified dollar amounts for the development of licensed products; (iii) submit an investigational new drug application covering at least one licensed product to the FDA within eight (8) years after the effective date of the License Agreement; (iv) initiate preclinical toxicology studies for at least one licensed product within six (6) years after the effective date of the License Agreement; (v) market at least one therapeutic licensed product in the U.S. within twelve (12) months after receiving regulatory approval to market the licensed product; or (vi) market at least one cell-based licensed product for the research market in the U.S. within twelve (12) months after the effective date of the License Agreement. We may fulfill the obligations described in (i) through (vi) through our own efforts or through the efforts of our affiliates and sublicensees.

***Asterias Cross-License Agreement***

Under the terms of a Cross-License Agreement (the "Cross-License") entered into by Asterias, BioTime, and ESI, BioTime and ESI received a fully-paid, non-royalty-bearing, world-wide, non-exclusive, sub-licensable license in, to, and under the certain Asterias patents and related patent rights for all purposes in the BioTime/ESI Licensed Field during the term of the license. The BioTime/ESI Licensed Field includes all fields of use except any and all applications (a) to treat disorders of the nervous system, (b) utilizing the immune system to prevent, treat, or cure cancer, and (c) involving the use of cells comprising, derived from, or manufactured using, human embryonic stem cells or human induced pluripotent stem cells for in vitro assay applications, including but not limited to drug discovery and development, drug monitoring, drug toxicology testing, and consumer products testing. BioTime has sublicensed its rights to certain subsidiaries.

Under the terms of the Cross-License, Asterias received a fully-paid, non-royalty-bearing, world-wide, non-exclusive, sub-licensable license under certain BioTime patents and related patent rights and ESI patents and related patent rights specified in the Cross-License, for all purposes in the Asterias Licensed Field during the term of the license. The Asterias Licensed Field includes all therapeutic applications of use for certain BioTime patents and ESI patents except all therapeutic applications of use involving pluripotent stem cell-derived cells of the following lineages: (a) bone and orthopedic soft tissues, including but not limited to ligament, tendon, meniscus, cartilage, and intervertebral disc; (b) vascular endothelium and perivascular cells including vascular smooth muscle and vascular pericytes; (c) adipose tissue; and (d) retinal pigment epithelium. The Asterias Licensed Field also includes all applications of use for certain other BioTime patents involving live human pluripotent stem cell-derived cell therapies directed to the neural spinal cord (excluding cartilage and bone of the spine) and the myocardium; and also live human pluripotent stem cell-derived glial cell therapies directed to the central nervous system.

The term of the Cross-License shall expire on the expiration of the last claim within the Asterias patents rights or BioTime patent rights, as applicable, unless terminated earlier for a material breach by a party.

## Major Customers and Sources of Revenues

### *Major Sources of Revenues*

The following table shows our major sources of revenues, as a percentage of total revenues, that were recognized during the years ended December 31, 2016, 2015, and 2014:

| | Revenues for the Year ending December 31, | | |
|---|---|---|---|
| **Sources of Revenues** | **2016** | **2015** | **2014** |
| CIRM grant income | 38.0% | 42.7% | 19.7% |
| NIH grant income | -% | 6.5% | 12.5% |
| IIA (formerly OCS) grant income (Cell Cure, Israel) | 24.0% | 14.4% | 31.3% |
| Subscriptions, advertising and other (various customers) (1) | 35.0% | 29.4% | 32.5% |
| Other (1) | 3.0% | 7.0% | 4.0% |

**(1)** No individual customer greater than 5% of total revenues.

### *By Geographic Area*

| | Revenues for the Year Ended December 31, | | |
|---|---|---|---|
| **Geographic Area** | **2016** | **2015** | **2014** |
| Domestic | $4,497 | $5,976 | $3,586 |
| Asia | 1,426 | 1,060 | 1,658 |
| Total revenues | $5,923 | $7,036 | $5,244 |

## Manufacturing

### *Facilities Required—Stem Cell Products*

We lease approximately 30,795 square feet of rentable space in two buildings located in an office park setting in Alameda, California. In addition, from February 10, 2017 until May 31, 2017, we are subleasing a small portion of Asterias' facility. Our subsidiaries or affiliates, OncoCyte, OrthoCyte, and ReCyte Therapeutics are also conducting their research and development activities at our Alameda facility and OncoCyte is establishing a diagnostic laboratory there to conduct any cancer diagnostic tests that it may successfully develop.

Cell Cure leases approximately 1,128 square meters of office, laboratory, warehousing and cGMP production space located in Jerusalem, Israel.

### *Facilities Required—Laboratory Diagnostic Tests*

OncoCyte constructed a CLIA compliant laboratory at our Alameda facility for the performance of any cancer diagnostic tests that it may successfully develop and commercialize. OncoCyte will be required to hold certain federal, state and local licenses, certifications and permits to operate its diagnostic test laboratory, including certification under CLIA, under the laws of the states from which it receives blood or urine samples for testing. See "Government Regulation — *Clinical Laboratory Improvement Amendments of 1988 and State Regulation.* "

### *Facilities Required—Plasma Volume Expanders*

Hospira manufactures *Hextend*® for use in the North American market, and CJ Health manufactures *Hextend*® for use in South Korea. Hospira and CJ Health have the facilities to manufacture *Hextend*® and our other products in commercial quantities. If Hospira and CJ Health choose not to manufacture and market other BioTime products, other manufacturers must be identified that would be willing to manufacture products for us or any licensee of our products as we do not have facilities to manufacture our plasma volume expander products in commercial quantities, or under cGMP.

### *Raw Materials—Plasma Volume Expanders*

Although most ingredients in the products we are developing are readily obtainable from multiple sources, we know of only a few manufacturers of the hydroxyethyl starches that serve as the primary drug substance in *Hextend*®. Hospira and CJ Health presently have a source of supply of the hydroxyethyl starch used in *Hextend*® and have agreed to maintain a supply sufficient to meet market demand for *Hextend*® in the countries in which they market the product. We believe that we will be able to obtain a sufficient supply of starch for our needs in the foreseeable future, although we do not have supply agreements in place. If for any reason a sufficient supply of hydroxyethyl starch could not be obtained, a licensee would have to acquire or obtain by contract the use of a manufacturing facility and the technology to produce the hydroxyethyl starch according to cGMP if the licensee elects to continue manufacturing *Hextend*®.

**Marketing**

***Online Database Products***

LifeMap Sciences sells subscriptions to its database products to biotech and pharmaceutical companies worldwide. The *GeneCards®* Suite, includes *GeneCards®*, the leading human gene database, *LifeMap Discovery®* the database of embryonic development, stem cell research and regenerative medicine; and *MalaCards™*, the human disease database.

***Plasma Volume Expanders***

*Hextend®* is being distributed in the U.S. by Hospira and in South Korea by CJ Health under exclusive licenses from us. Hospira also has the right to obtain licenses to manufacture and sell our other plasma volume expander products.

Because *Hextend®* is a surgical product, sales efforts are directed to physicians and hospitals. *Hextend®* competes with other products used to treat or prevent hypovolemia, including albumin, generic 6% hetastarch solutions, and crystalloid solutions. The competing products have been commonly used in surgery and trauma care for many years, and in order to sell *Hextend®*, physicians must be convinced to change their product loyalties. The market price of albumin has declined and generic 6% hetastarch solutions sell at low prices, which has caused Hospira and CJ Health to lower the prices at which they sell *Hextend®*.

In addition to price competition, sales of *Hextend®* have been adversely affected if certain safety labeling changes required by the FDA for the entire class of hydroxyethyl starch products, including *Hextend®*. The labeling changes were approved by the FDA in November 2013 and include a boxed warning stating that the use of hydroxyethyl starch products, including *Hextend®*, increases the risk of mortality and renal injury requiring renal replacement therapy in critically ill adult patients, including patients with sepsis, and that *Hextend®* should not be used in critically ill adult patients, including patients with sepsis. Warning and precaution information is required along with information about contraindications, adverse reactions, and certain recent studies. The warning and precautions include avoiding the use of *Hextend®* in patients with pre-existing renal dysfunction, that the coagulation status of patients undergoing open heart surgery in association with cardiopulmonary bypass should be monitored as excess bleeding has been reported with hydroxyethyl starch solutions in that population, that the use of *Hextend®* should be discontinued at the first sign of coagulopathy, and that the liver function of patients receiving hydroxyethyl starch products, including *Hextend®* should also be monitored.

***Therapeutic Products and Medical Devices***

Because our planned therapeutic products and medical devices are still in the research and development stage, we will not initially need to have our own marketing personnel. If we or our subsidiaries are successful in developing marketable therapeutic products and medical devices we will need to build our own marketing and distribution capability for those products, which would require the investment of significant financial and management resources, or we and our subsidiaries will need to find collaborative marketing partners, independent sales representatives, or wholesale distributors for the commercial sale of those 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. This means that our gross profit from product sales may be less than would be the case if we were to sell our products directly to end users at retail prices through our own sales force. On the other hand, selling to distributors or through independent sales representatives would allow us to avoid the cost of hiring and training our own sales employees. There can be no assurance we will be 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.

***Laboratory Diagnostic Tests***

Following CLIA certification of its laboratory and diagnostic tests, OncoCyte will market its diagnostic tests directly to health care providers working in the areas of cancer for which OncoCyte develops liquid biopsy tests. The health care providers will collect blood samples or send patients to laboratories to have blood or urine samples collected. The blood or urine samples will be sent to OncoCyte's CLIA laboratory in Alameda California, either by the health care provider or the laboratory, where the sample will be run through an assay and a gene expression classifier to determine a binary result, either benign or suspicious. That result will be presented to the physician ordering the procedure in a standardized report. OncoCyte expects to ramp up sales and marketing teams in coordination with progress in the development of its diagnostic tests and over time will continue to grow its sales, market access and marketing organizations to increase the awareness and utilization of its diagnostic tests.

**Patents and Trade Secrets**

We rely primarily on patents and contractual obligations with employees and third parties to protect our proprietary rights. We have sought, and intend to continue to seek, appropriate patent protection for important and strategic components of our proprietary technologies by filing patent applications in the U.S. and certain foreign countries. There are no assurances that any of our intellectual property rights will guarantee protection or market exclusivity for our products and product candidates. We also use license agreements both to access technologies developed by other companies and universities and to convey certain intellectual property rights to others. Our financial success will be dependent, in part, on our ability to obtain commercially valuable patent claims, to protect and enforce our intellectual property rights, and to operate without infringing upon the proprietary rights of others if we are unable to obtain enabling licenses.

As of March 6, 2017, we owned or controlled or licensed directly or through our subsidiaries approximately 850 patents and pending patent applications worldwide including more than 180 issued or pending U.S. patents or patent applications. We also licensed over 140 patents and applications from WARF.

Our patents and patent applications are directed to compositions of matter, formulations, methods of use and/or methods of manufacturing, as appropriate. In addition to patenting our own technology and that of our subsidiaries, we and our subsidiaries have licensed patents and patent applications for certain stem cell technology, hEPC, and hES cell lines, diagnostic markers, hydrogel technology, and other technology from other companies. See "Licensed Stem Cell Technologies and Stem Cell Product Development Agreements."

The patent positions of pharmaceutical and biotechnology companies, including ours, are generally uncertain and involve complex legal and factual questions. Our business could be negatively impacted by any of the following:

- the claims of any patents that are issued may not provide meaningful protection, may not provide a basis for commercially viable products or may not provide us with any competitive advantages;
- our patents may be challenged by third parties;
- others may have patents that relate to our technology or business that may prevent us from marketing our product candidates unless we are able to obtain a license to those patents;
- the pending patent applications to which we have rights may not result in issued patents;
- we may not be successful in developing additional proprietary technologies that are patentable.

In addition, others may independently develop similar or alternative technologies, duplicate any of our technologies and, if patents are licensed or issued to us, design around the patented technologies licensed to or developed by us. Moreover, we could incur substantial costs in litigation if we have to defend ourselves in patent lawsuits brought by third parties or if we initiate such lawsuits.

In Europe, there is uncertainty about the eligibility of hES cell subject matter for patent protection. The European Patent Convention prohibits the granting of European patents for inventions that concern "uses of human embryos for industrial or commercial purposes." A recent decision at the Court of Justice of the European Union interpreted parthenogenetically produced hES cells as patentable subject matter. Consequently, the European Patent Office now recognizes that human pluripotent stem cells (including human ES cells) can be created without a destructive use of human embryos as of June 5, 2003, and patent applications relating to hES cell subject matter with a filing and priority date after that date are no longer automatically excluded from patentability under Article 53 (a) EPC and Rule 28(c) EPC.

The United States Supreme Court's decisions in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.* and *Association for Molecular Pathology v. Myriad Genetics* may limit OncoCyte's ability to obtain patent protection on diagnostic methods that merely recite a correlation between a naturally occurring event and a diagnostic outcome associated with that event.

Cell Cure is presently a party to two pending opposition proceedings in the European Patent Office involving EP Patent Numbers 2147094 (issued 08-Oct-2014) and 2554661 (issued 19-Nov-2014), both entitled, "Stem Cell-Derived Retinal Pigment Epithelial Cells". The Oral Proceedings dates are 16-Mar-2017 and 17-Mar-2017, respectively. Both patents relate to our *OpRegen*® product and provide protection until April 2028. Cell Cure is vigorously defending these patents in the proceedings and does not believe the outcome will materially alter the protection or positioning of the *OpRegen*® product in the market. There are additional patent applications pending that if issued will provide further protection for *OpRegen*®.

***Patents Used in Our Stem Cell Business***

Oligodendrocyte progenitor cells: The patent rights relevant to oligodendrocyte progenitor cells include rights licensed from the University of California and various developed patent families covering the growth of hES cells and their differentiation into neural cells. There are issued patents in the United States, Australia, Canada, China, United Kingdom, Japan, Singapore and Israel. The expiration dates of these patents range from 2023 to 2029.

Cardiomyocytes: The patent rights relevant to cardiomyocytes include various patent families covering the growth of hES cells and their differentiation into cardiomyocytes. There are issued patents in the United States, Australia, Canada, China, United Kingdom, Hong Kong, Korea, Japan, India, Singapore and Israel. The expiration dates of these patents range from 2022 to 2029.

Pancreatic islet cells: The patent rights relevant to pancreatic islet cells include various patent families covering the growth of hES cells and their differentiation into pancreatic islet cells. There are issued patents in the United States, Australia, Canada, United Kingdom, Hong Kong, Korea, Japan, China, Singapore and Israel. The expiration dates of these patents are in 2022 to 2028.

Hepatocytes: The patent rights relevant to hepatocytes include various patent families covering the growth of hES cells and their differentiation into hepatocytes. There are issued patents in the United States, Australia, Canada, United Kingdom, Korea, India, Singapore and Israel. The expiration dates of these patents are in 2020 to 2029.

Neural cells: The patent rights relevant to neural cells include various patent families covering the growth of hES cells and their differentiation into neural cells. There are issued patents in the United States, Australia, Canada, United Kingdom, Japan, China, Hong Kong, India, Korea, Singapore and Israel. The expiration dates of these patents are in 2020 to 2023.

Hematopoietic cells: The patent rights relevant to hematopoietic cells include rights licensed from certain third parties and various patent families covering the growth of hES cells and their differentiation into hematopoietic cells. There are issued patents in the United States, Australia, United Kingdom, Singapore and Israel. The expiration dates of these patents are in 2022 to 2029.

Osteoblasts: The patent rights relevant to osteoblasts include various patent families covering the growth of hES cells and their differentiation into osteoblasts. There are issued patents in the Australia, United Kingdom, India, Singapore and Israel. The expiration dates of these patents are in 2022.

Chondrocytes: The patent rights relevant to chondrocytes include various patent families covering the growth of hES cells and their differentiation into chondrocytes. There are issued patents in the United States, Australia, Canada, Korea, Singapore and Israel. The expiration dates of these patents are in 2022 to 2023.

Dendritic cells: The patent rights relevant to dendritic cells include rights licensed from third parties and various patent families covering the growth of hES cells and their differentiation into dendritic cells. There are issued patents in the United States, Australia, Europe, Canada, China, Hong Kong and Japan. The expiration dates of these patents range from 2019 to 2025.

Platform patents: The platform patent rights include various patent families covering the growth of hES cells. There are issued patents in the United States, Australia, Canada, United Kingdom, Hong Kong, China, India, Japan, Singapore and Israel. The expiration dates of these patents range from 2018 to 2030.

*ViaCyte Patent Interference Proceedings*

During May 2014, Asterias entered into a settlement agreement with ViaCyte, Inc. ("ViaCyte") concerning certain litigations in several jurisdictions. Under the terms of the settlement agreement, the parties granted to each other a royalty free, fully paid license to each other's technology relating to endoderm lineage cells including definitive endoderm and gut endoderm cells, only to the extent necessary to allow the licensee to make, use, sell, offer for sale, or import endodermal lineage cells. The Asterias patents that were licensed to ViaCyte in the settlement include US Patent Application No 11/262-633. The ViaCyte patents that were licensed to us in the settlement included US Patent Application Nos. 11/021,618, 12/093,590, 10/584,338, 11/165,305, 11/317,387, and 11/860,494.

***Patents Used by OncoCyte***

OncoCyte's diagnostic patent portfolio includes 13 patent families owned by OncoCyte with claims directed to compositions of matter and methods useful for detection of breast, bladder, colon, pancreatic, ovarian, and thyroid cancers using specific biomarkers or a panel of specific biomarkers. Patents are pending in various jurisdictions, including the United States, Europe, Australia, Canada, China, Hong Kong, Japan and Republic of Korea, with projected expiration dates ranging from 2032 to 2036. Additionally, they have one issued patent in Australia, with claims directed to a method of detecting bladder cancer; and one accepted patent application in Australia, with claims directed to a method of detecting breast cancer. The issued patent will expire in 2032.

OncoCyte has also obtained an exclusive license from Wistar to certain pending patent applications in the field of molecular diagnostics for lung cancer. The pending claims are directed to compositions of matter and methods useful for detection of lung cancer using specific biomarkers or a panel of specific biomarkers, with projected expiration dates in 2036. Additionally, we have obtained from Wistar an exclusive option under which we may obtain licenses to additional issued and pending patents in the field of molecular diagnostics for lung cancer. Patents covered by the exclusive option have issued in the United States and Europe and are pending in the United States, Canada and India. Those patents are projected to expire in 2028 - 2030.

***Patents Used in Our Plasma Volume Expander Business***

We currently hold three issued U. S. patents with methods-of-use claims covering *Hextend*®. The most recent U.S. patents were issued during May 2011.Our patents in the U.S., which include claims directed to methods-of-use of *Hextend*®, are expected to remain in force until 2019. Patents covering certain proprietary solutions have also issued in several countries and remain in force in Canada, China, Israel, Japan, New Zealand, and Taiwan.

***General Risks Related to Obtaining and Enforcing Patent Protection***

There is a risk that any patent applications that we file and any patents that we hold or later obtain could be challenged by third parties and be declared invalid or infringing on third party claims. Litigation, interferences, oppositions, inter partes reviews or other proceedings are, have been and may in the future be necessary in some instances to determine the validity and scope of certain of our proprietary rights, and in other instances to determine the validity, scope or non-infringement of certain patent rights claimed by third parties to be pertinent to the manufacture, use or sale of our products. We may also face challenges to our patent and regulatory protections covering our products by third parties, including manufacturers of generics and biosimilars that may choose to launch or attempt to launch their products before the expiration of our patent or regulatory exclusivity. Litigation, interference, oppositions, inter partes reviews, administrative challenges or other similar types of proceedings are unpredictable and may be protracted, expensive and distracting to management. The outcome of such proceedings could adversely affect the validity and scope of our patent or other proprietary rights, hinder our ability to manufacture and market our products, require us to seek a license for the infringed product or technology or result in the assessment of significant monetary damages against us that may exceed amounts, if any, accrued in our financial statements. An adverse determination in a judicial or administrative proceeding or a failure to obtain necessary licenses could prevent us from manufacturing or selling our products. Furthermore, payments under any licenses that we are able to obtain would reduce our profits derived from the covered products and services.

The enforcement of patent rights often requires litigation against third-party infringers, and such litigation can be costly to pursue. Even if we succeed in having new patents issued or in defending any challenge to issued patents, there is no assurance that our patents will be comprehensive enough to provide us with meaningful patent protection against our competitors.

In addition to relying on patents, we rely on trade secrets, know-how, and continuing technological advancement to maintain our competitive position. We have entered into intellectual property, invention, and non-disclosure agreements with our employees, and it is our practice to enter into confidentiality agreements with our consultants. There can be no assurance, however, that these measures will prevent the unauthorized disclosure or use of our trade secrets and know-how, or that others may not independently develop similar trade secrets and know-how or obtain access to our trade secrets, know-how, or proprietary technology.

**Competition**

We face substantial competition in all of fields of business in which we engage. That competition is likely to intensify as new products and technologies reach the market. Superior new products are likely to sell for higher prices and generate higher profit margins once acceptance by the medical community is achieved. Those companies that are successful at being the first to introduce new products and technologies to the market may gain significant economic advantages over their competitors in the establishment of a customer base and track record for the performance of their products and technologies. Such companies will also benefit from revenues from sales that could be used to strengthen their research and development, production, and marketing resources. Companies engaged in the medical products industry face the risk of obsolescence of their products and technologies as more advanced or cost-effective products and technologies are developed by competitors. As the industry matures, companies will compete based upon the performance and cost-effectiveness of their products.

***Products for Regenerative Medicine***

The stem cell industry is characterized by rapidly evolving technology and intense competition. Our competitors include major multinational pharmaceutical companies, specialty biotechnology companies, and chemical and medical products companies operating in the fields of regenerative medicine, cell therapy, tissue engineering, and tissue regeneration. Many of these companies are well established and possess technical, research and development, financial, and sales and marketing resources significantly greater than ours. In addition, certain smaller biotech companies have formed strategic collaborations, partnerships, and other types of joint ventures with larger, well-established industry competitors that afford the smaller companies' potential research and development as well as commercialization advantages. Academic institutions, governmental agencies, and other public and private research organizations are also conducting and financing research activities, which may produce products directly competitive to those we are developing.

We believe that some of our competitors are trying to develop pluripotent cells and hEPC-based technologies and products that may compete with our stem cell products based on efficacy, safety, cost, and intellectual property positions. We are aware that Ocata, which was recently acquired by a subsidiary of Astellas Pharma Inc., is conducting clinical trials of a hES cell product designed to treat age-related macular degeneration. If the Ocata product is proven to be safe and effective, it may reach the market ahead of Cell Cure Neuroscience's *OpRegen*®.

We may also face competition from companies that have filed patent applications relating to the propagation and differentiation of stem cells. Those companies include Ocata, which in 2015 had certain US patents issue with claims directed to methods of producing RPE cells and isolating and purifying such cells. We may be required to seek licenses from these competitors in order to commercialize certain products proposed by us, and such licenses may not be granted.

***Cancer Diagnostic Testing***

The cancer diagnostic test industry is characterized by rapidly evolving technology and intense competition. OncoCyte's competitors include major multinational diagnostic companies and specialty biotechnology companies. Many of these companies are well-established and possess technical, research and development, financial, and sales and marketing resources significantly greater than OncoCyte's. In addition, smaller biotech companies may form strategic collaborations, partnerships, and other types of joint ventures with larger, well established industry competitors that afford these companies' potential research and development and commercialization advantages. Academic institutions, governmental agencies, and other public and private research organizations are also conducting and financing research activities which may produce diagnostic tests directly competitive to those OncoCyte is developing.

Molecular diagnostic competitors in the category of OncoCyte's first planned diagnostic test launch (lung confirmatory) include two currently marketed diagnostic tests. Xpresys Lung was launched in late 2013 by Integrated Diagnostics and that company has recently announced coverage by major payers. The other currently marketed diagnostic test is Early CDT lung, which was launched in 2012 by a European diagnostics company OncImmune Ltd. OncImmune has sold its U.S. assets to a CLIA laboratory, operating under the name OncImmune USA, LLC. Additionally, OncoCyte anticipates competition from Exact Sciences Corp, Gensignia Life Sciences, Inc. and Veracyte, Inc. which have diagnostic tests in the pipeline. Gensignia announced the certification of its CLIA lab in October 2015.

In addition to molecular diagnostics, an imaging competitor has a diagnostic test that may compete directly in confirmatory lung diagnostic testing. VisionGate, Inc. has a sputum test that is read by their proprietary system, which takes an optical CT scan of individual cells to generate 3D images of each cell.

***Plasma Volume Expanders***

Our plasma volume expander solution, *Hextend*®, competes with products currently used to treat or prevent hypovolemia, including albumin, other colloid solutions, and crystalloid solutions presently manufactured by established pharmaceutical companies, and with human blood products. To compete with new and existing plasma expanders, we have developed products that contain constituents that may prevent or reduce the physiological imbalances, bleeding, fluid overload, edema, poor oxygenation, and organ failure that can occur when competing products are used.

*Hextend*® competes with products that are commonly used in surgery and trauma care, and some, especially crystalloids, sell at low prices. The competing products are being manufactured and marketed by established pharmaceutical companies with large research facilities, technical staffs, and financial and marketing resources. B. Braun presently markets *Hespan*®, an artificial plasma volume expander containing 6% hetastarch in saline solution. Hospira and Teva sell a generic equivalent of *Hespan*®. Hospira, also markets *Voluven*®, a plasma volume expander containing a 6% low molecular weight hydroxyethyl starch in saline solution. Sanofi-Aventis, Baxter International, and Alpha Therapeutics sell albumin, and Hospira, Baxter International, and B. Braun sell crystalloid solutions. As a result of the introduction of generic plasma expanders and new proprietary products, competition in the plasma expander market has intensified, and wholesale prices of both hetastarch products and albumin have declined which has forced Hospira and CJ Health to make reduce the price at which they sell *Hextend*® in order to maintain their share of the market.

**Government Regulation**

Government authorities at the federal, state and local level, and in other countries, extensively regulate among other things, the development, testing, manufacture, quality, approval, distribution, labeling, packaging, storage, record keeping, marketing, import/export and promotion of drugs, biologics, and medical devices. Laboratories performing diagnostic tests such as those being developed by OncoCyte are also subject to regulation at both the federal and state level. Authorities also heavily regulate many of these activities for human cells, tissues and cellular and tissue-based products or HCT/Ps.

***FDA and Foreign Regulation of Therapeutic Products***

The FDA and foreign regulatory authorities will regulate our proposed products as drugs, biologicals, or medical devices, depending upon such factors as the use to which the product will be put, the chemical composition, and the interaction of the product with the human body. In the United States, the FDA regulates drugs and biologicals under the Federal Food, Drug and Cosmetic Act or FDCA, the Public Health Service Act, or PHSA, and implementing regulations. In addition, establishments that manufacture human cells, tissues, and cellular and tissue-based products are subject to additional registration and listing requirements, including current good tissue practice regulations. Many of Asterias' proposed products will be reviewed by the FDA staff in its Center for Biologics Evaluation and Research ("CBER") Office of Cellular, Tissue and Gene Therapies.

Our domestic human drug and biological products will be subject to rigorous FDA review and approval procedures. After testing in animals to evaluate the potential efficacy and safety of the product candidate, an investigational new drug ("IND") submission must be made to the FDA to obtain authorization for human testing. Extensive clinical testing, which is generally done in three phases, must then be undertaken at a hospital or medical center to demonstrate optimal use, safety, and efficacy of each product in humans. Each clinical study is conducted under the auspices of an independent Institutional Review Board ("IRB"). The IRB will consider, among other things, ethical factors, the safety of human subjects, and the possible liability of the institution.

Clinical trials are generally conducted in three "phases." Phase I clinical trials are conducted in a small number of healthy volunteers or volunteers with the target disease or condition to assess safety. Phase II clinical trials are conducted with groups of patients afflicted with the target disease or condition in order to determine preliminary efficacy, optimal dosages and expanded evidence of safety. In some cases, an initial trial is conducted in diseased patients to assess both preliminary efficacy and preliminary safety, in which case it is referred to as a Phase I/II trial. Phase III trials are large-scale, multi-center, comparative trials and are conducted with patients afflicted with the target disease or condition in order to provide enough data to demonstrate the efficacy and safety required by the FDA. The FDA closely monitors the progress of each of the three phases of clinical testing and may, at its discretion, re-evaluate, alter, suspend, or terminate the clinical trial based upon the data which have been accumulated to that point and its assessment of the risk/benefit ratio to the intended patient population. All adverse events must be reported to the FDA. Monitoring of all aspects of the study to minimize risks is a continuing process. The time and expense required to perform this clinical testing can far exceed the time and expense of the research and development initially required to create the product.

No action can be taken to market any therapeutic product in the U.S. until an appropriate New Drug Application ("NDA") or Biologics License Application (BLA) has been approved by the FDA. Submission of the application is no guarantee that the FDA will find it complete and accept it for filing. If an application is accepted for filing, following the FDA's review, the FDA may grant marketing approval, request additional information or deny the application if it determines that the application does not provide an adequate basis for approval. FDA regulations also restrict the export of therapeutic products for clinical use prior to FDA approval. To date, the FDA has not granted marketing approval to any pluripotent stem-based therapeutic products and it is possible that the FDA or foreign regulatory agencies may subject our product candidates to additional or more stringent review than drugs or biologicals derived from other technologies.

The FDA offers several programs to expedite development of products that treat serious or life-threatening illnesses and that provide meaningful therapeutic benefits to patients over existing treatments. A product may be eligible for breakthrough therapy designation if it treats a serious or life-threatening disease or condition and preliminary clinical evidence indicates it may demonstrate substantial improvement over existing therapies on one or more clinically significant endpoints. In December 2016, in the 21 $^{st}$ Century Cures Act adopted a new designation of Regenerative Advanced Therapy Designation. Under the 21st Century Cures Act, a drug is eligible for designation as a regenerative advanced therapy ("RAT") if: the drug is a regenerative medicine therapy, which is defined as a cell therapy, therapeutic tissue engineering product, human cell and tissue product, or any combination product using such therapies or products, except for those regulated solely under certain other sections. the drug is intended to treat, modify, reverse, or cure a serious or life-threatening disease or condition; and preliminary clinical evidence indicates that the drug has the potential to address unmet medical needs for such disease or condition. Some of our current and future products may be eligible for RAT designation. RAT designation allows for similar benefits as the breakthrough therapy designation. There is no assurance that the FDA will grant breakthrough therapy, accelerated approval or RAT status to any of our product candidates.

***Certain Medical Devices***

Obtaining regulatory approval of *Renevia*® or a similar implantable matrix for tissue transplant or stem cell therapy in Europe will require the preparation of a design dossier containing details on the product manufacturing and production methods, analytical controls to assure that the product meets its release specification, data from analytical assay and process validations, ISO 10993 biocompatibility testing, as well as pre-clinical and clinical safety and efficacy data. Completion of the manufacturing, analytical, biocompatibility, and clinical trials represents a majority of the expenses associated with the regulatory application process in Europe. The procedures for obtaining FDA approval to sell products in the U.S. are likely to be more stringent, and the cost greater, than would be the case in an application for approval in Europe.

### *Combination Products*

If we develop any products that are used with medical devices, they may be considered combination products, which are defined by the FDA to include products comprised of two or more regulated components or parts such as a biologic and a device. For example, our *HyStem®* hydrogel products such as *Renevia®* may be used to administer one or more pluripotent stem cell-based therapy products. When regulated independently, biologics and devices each have their own regulatory requirements. However, the regulatory requirements for a combination product comprised of a biologic administered with a delivery device can be more complex, because in addition to the individual regulatory requirements for each component, additional combination product regulatory requirements may apply. There is an Office of Combination Products at the FDA that coordinates the review of such products and determines the primary mode of action of a combination product. The definition and regulatory requirements for combination products may differ significantly among other countries in which we may seek approval of our product candidates.

### *Post-Approval Matters*

Even after initial FDA or foreign regulatory agency approval has been obtained, further studies may be required to provide additional data on safety or to gain approval for the use of a product as a treatment for clinical indications other than those initially targeted. Use of a product during testing and after marketing could reveal side effects that could delay, impede, or prevent marketing approval, result in a regulatory agency-ordered product recall, or in regulatory agency-imposed limitations on permissible uses or in withdrawal of approval. For example, if the FDA or foreign regulatory agency becomes aware of new safety information after approval of a product, it may require us to conduct further clinical trials to assess a known or potential serious risk and to assure that the benefit of the product outweigh the risks. If we are required to conduct such a post-approval study, periodic status reports must be submitted to the FDA or foreign regulatory agency. Failure to conduct such post-approval studies in a timely manner may result in substantial civil or criminal penalties. Data resulting from these clinical trials may result in expansions or restrictions to the labeled indications for which a product has already been approved.

### *FDA Regulation of Manufacturing*

The FDA regulates the manufacturing process of pharmaceutical products, human tissue and cell products, and medical devices, requiring that they be produced in compliance with cGMP. See “Manufacturing.” The FDA regulates and inspects equipment, facilities, laboratories, processes used in the manufacturing and testing of products prior to providing approval to market products. If after receiving approval from the FDA, a material change is made to manufacturing equipment or to the location or manufacturing process, additional regulatory review may be required. The FDA also conducts regular, periodic visits to re-inspect the equipment, facilities, laboratories and processes of manufacturers following an initial approval. If, as a result of those inspections, the FDA determines that that equipment, facilities, laboratories or processes do not comply with applicable FDA regulations and conditions of product approval, the FDA may seek civil, criminal or administrative sanctions and/or remedies against the manufacturer, including suspension of manufacturing operations. Issues pertaining to manufacturing equipment, facilities or processes may also delay the approval of new products undergoing FDA review.

### *FDA Regulation of Advertising and Product Promotion*

The FDA also regulates the content of advertisements used to market pharmaceutical and biological products. Claims made in advertisements concerning the safety and efficacy of a product, or any advantages of a product over another product, must be supported by clinical data filed as part of an NDA, a BLA, or a pre-market notification or pre-market approval application for a medical device (“PMA”), or an amendment to an NDA, a BLA or a pre-market notification or PMA, and must be consistent with the FDA approved labeling and dosage information for that product.

### *Foreign Regulation*

Sales of pharmaceutical products outside the U.S. are subject to foreign regulatory requirements that vary widely from country to country. Even if FDA approval has been obtained, approval of a product by comparable regulatory authorities of foreign countries must be obtained prior to the commencement of marketing the product in those countries. The time required to obtain such approval may be longer or shorter than that required for FDA approval.

### *Federal Funding of Research*

The United States government and its agencies have until recently refused to fund research which involves the use of human embryonic tissue. President Bush issued Executive Orders on August 9, 2001 and June 20, 2007 that permitted federal funding of research on hES cells using only the limited number of hES cell lines that had already been created as of August 9, 2001. On March 9, 2009, President Obama issued an Executive Order rescinding President Bush’s August 9, 2001 and June 20, 2007 Executive Orders. President Obama’s Executive Order also instructed the NIH to review existing guidance on human stem cell research and to issue new guidance on the use of hES cells in federally funded research, consistent with President's new Executive Order and existing law. The NIH has adopted new guidelines that went into effect July 7, 2009. The central focus of the new 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. Those 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 addition to President Obama's Executive Order, a bipartisan bill has been introduced in the U.S. Senate that would allow Federal funding of hES research. The Senate bill is identical to one that was previously approved by both Houses of Congress but vetoed by President Bush. The Senate Bill provides that hES cells will be eligible for use in research conducted or supported by federal funding if the cells meet each of the following guidelines: (1) the stem cells were derived from human embryos that have been donated from IVF clinics, were created for the purposes of fertility treatment, and were in excess of the clinical need of the individuals seeking such treatment, (2) prior to the consideration of embryo donation and through consultation with the individuals seeking fertility treatment, it was determined that the embryos would never be implanted in a woman and would otherwise be discarded, and (3) the individuals seeking fertility treatment donated the embryos with written informed consent and without receiving any financial or other inducements to make the donation. The Senate Bill authorizes the NIH to adopt further guidelines consistent with the legislation.

***California State Regulations***

The state of California has adopted legislation and regulations that require institutions that conduct stem cell research to notify, and in certain cases obtain approval from, a Stem Cell Research Oversight Committee ("SCRO Committee") before conducting the research. Advance notice, but not approval by the SCRO Committee, is required in the case of *in vitro* research that does not derive new stem cell lines. Research that derives new stem cell lines or that involves fertilized human oocytes or blastocysts, or that involves clinical trials or the introduction of stem cells into humans, or that involves introducing stem cells into animals, requires advanced approval by the SCRO Committee. Clinical trials may also entail approvals from IRB at the medical center at which the study is conducted, and animal studies may require approval by an Institutional Animal Care and Use Committee.

All hES cell lines that will be used in our research must be acceptably derived. To be acceptably derived, the pluripotent stem cell line must have either:

- Been listed on the National Institutes of Health Human Embryonic Stem Cell Registry; or
- Been deposited in the United Kingdom Stem Cell Bank; or
- Been derived by, or approved for use by, a licensee of the United Kingdom Human Fertilisation and Embryology Authority; or
- Been derived in accordance with the Canadian Institutes of Health Research Guidelines for Human Stem Cell Research under an application approved by the National Stem Cell Oversight Committee; or
- Been approved by CIRM in accordance with California Code of Regulation Title 17, Section 100081; or
- Been derived under the following conditions:
  - (a) Donors of gametes, embryos, somatic cells, or human tissue gave voluntary and informed consent,
  - (b) Donors of gametes, embryos, somatic cells, or human tissue did not receive valuable consideration. This provision does not prohibit reimbursement for permissible expenses as determined by an IRB,
  - (c) Donation of gametes, embryos, somatic cells, or human tissue was overseen by an IRB (or, in the case of foreign sources, an IRB equivalent), and
  - (d) Individuals who consented to donate stored gametes, embryos, somatic cells, or human tissue were not reimbursed for the cost of storage prior to the decision to donate.

Other hES lines may be deemed acceptably derived if they were derived in accordance with (a), (b), and (d) above and the hES line was derived prior to the publication of the National Academy of Sciences guidelines on April 26, 2005 and a SCRO Committee has determined that the investigator has provided sufficient scientific rationale for the need for use of the line, which should include establishing that the proposed research cannot reasonably be carried out with covered lines that did have IRB approval.

California regulations also require that certain records be maintained with respect to stem cell research and the materials used, including:

- A registry of all human stem cell research conducted, and the source(s) of funding for this research; and
- A registry of human pluripotent stem cell lines derived or imported, to include, but not necessarily limited to:
  - (a) The methods utilized to characterize and screen the materials for safety;
  - (b) The conditions under which the materials have been maintained and stored;
  - (c) A record of every gamete donation, somatic cell donation, embryo donation, or product of somatic cell nuclear transfer that has been donated, created, or used;
  - (d) A record of each review and approval conducted by the SCRO Committee.

***Regulation of Diagnostic Tests***

*Clinical Laboratory Improvement Amendments of 1988 and State Regulation*

As a provider of laboratory testing on human specimens for the purpose of disease diagnosis, prevention, or treatment, OncoCyte will be required to hold certain federal, state and local licenses, certifications and permits to conduct its business. In 1988, Congress enacted the Clinical Laboratory Improvement Amendments of 1988, ("CLIA"), which established quality standards for all laboratories providing testing to ensure the accuracy, reliability and timeliness of patient test results regardless of where the test was performed. OncoCyte's laboratory will need to obtain a CLIA certificate of accreditation and will be required to meet certain laboratory licensing and other requirements under laws of the states in which it operate or from which OncoCyte receives blood or urine samples for testing.

Under CLIA, a laboratory is defined as any facility that performs laboratory testing on specimens derived from humans for the purpose of providing information for the diagnosis, prevention or treatment of disease, or the impairment of, or assessment of health of human beings. Under CLIA OncoCyte will be required to hold a certificate applicable to the complexity of the categories of testing performed and that OncoCyte comply with certain standards. CLIA further regulates virtually all clinical laboratories by requiring that they comply with various operational, personnel, facilities administration, quality and proficiency testing requirements intended to ensure that their clinical laboratory testing services are accurate, reliable and timely. CLIA certification is also a prerequisite to be eligible to be reimbursed for services provided to state and federal health care program beneficiaries. CLIA is user-fee funded. Therefore, all costs of administering the program must be covered by the regulated facilities, including certification and survey costs.

Under the CLIA, laboratory licensing requires a site inspection, review of standard operating procedures and verification that diagnostic results can be reproduced reliably across a number of different conditions. Before submitting for a license, extensive clinical testing, which is typically done in two phases, must be undertaken at a hospital or medical center to demonstrate optimal use, safety, and efficacy of the test in diagnosing a specific condition. Each clinical study is conducted under the auspices of an IRB that will consider, among other things, ethical factors, the safety of human subjects, and the possible liability of the institution.

Clinical studies are generally conducted in two phases. The first phase is analytical validation which is done in the research laboratory and involves the replication of consistent results for the same sample across a spectrum of different conditions. Once the analytical validation is completed, the assay moves into clinical validation. In clinical validation tests are run to confirm that consistent results for the same sample can be obtained in the actual laboratory that will conduct the commercial tests.

OncoCyte will be subject to regular surveys and inspections to assess compliance with program standards. Laboratories performing high complexity testing are required to meet more stringent requirements than laboratories performing less complex tests.

*FDA Regulation of Diagnostic Tests*

OncoCyte's diagnostic tests will likely be classified as laboratory diagnostic tests ("LDTs"), and consequently be governed under the CLIA regulations, as administered by The Centers for Medicare and Medicaid Services ("CMS"), as well as by applicable state laws. Historically, the FDA has exercised enforcement restraint with respect to most LDTs and has not required laboratories that offer LDTs to comply with FDA requirements for medical devices, such as registration, device listing, quality systems regulations, premarket clearance or premarket approval, and post-market controls. In recent years, however, the FDA has stated it intends to end its policy of enforcement restraint and begin regulating certain LDTs as medical devices. On October 3, 2014, the FDA issued two draft guidance documents, entitled "Framework for Regulatory Oversight of Laboratory Developed Tests (LDTs)" and "FDA Notification and Medical Device Reporting for Laboratory Developed Tests (LDTs)", respectively, that set forth a proposed risk-based regulatory framework that would apply varying levels of FDA oversight to LDTs. The FDA has indicated that it does not intend to modify its policy of enforcement restraint until the draft guidance documents are finalized. It is unclear at this time when, or if, the draft guidance documents will be finalized, and even then, the new regulatory requirements are proposed to be phased-in consistent with the schedule set forth in the guidance, which may happen in as little as 12 months after the draft guidance is finalized for certain high-priority LDTs. Nevertheless, the FDA may decide to regulate certain LDTs on a case-by-case basis at any time.

On January 13, 2017, the FDA issued a Discussion Paper on LDTs ("Discussion Paper"), which follows the FDA's late 2016 announcement that contrary to its earlier reports, it would not issue a final guidance on its proposed oversight of LDTs and allow for further public discussion on appropriate oversight. As it did in its 2014 guidance documents, the FDA continues to advocate a risk based approach to LDT oversight and proposes focusing on new and significantly modified high and moderate risk LDTs; however, new and significantly modified LDTs in certain categories would not be expected to comply with premarket review, quality systems, and registration and listing requirements unless necessary to protect public health. These exempt categories include low risk LDTs, LDTs for rare diseases, traditional LDTs, LDTs intended solely for public health surveillance, certain LDTs used in CLIA certified labs, and LDTs intended solely for forensic use. Based on the FDA's guidance in the Discussion Paper, our products will likely not require FDA filing before launch. With respect to the postmarket surveillance of LDTs, the FDA's Discussion Paper recommends that laboratories initially report serious adverse events for all tests except the exempted categories if tests, which include LDTs intended for public health surveillance, some stem cell/tissue/organ transplantation LDTs, and LDTs intended solely for forensic use. The Discussion Paper notes that while the report neither represents the formal position of the FDA and nor is it a final version of the LDT guidance documents published in 2014, it is hoped that its publication will continue to advance further public disclosure.

Failure to comply with applicable FDA regulatory requirements may trigger a range of enforcement actions by the FDA, including warning letters, civil monetary penalties, injunctions, criminal prosecution, recall or seizure, operating restrictions, partial suspension or total shutdown of operations, and denial of or challenges to applications for clearance or approval, as well as significant adverse publicity. We cannot predict the ultimate form or impact of any such FDA guidance and the potential effect on our diagnostic test services.

We cannot provide any assurance that FDA regulation, including premarket review, will not be required in the future for OncoCyte's diagnostic tests, whether through additional guidance or regulations issued by the FDA, new enforcement policies adopted by the FDA or new legislation enacted by Congress. It is possible that proposed legislation discussed above or other new legislation could be enacted into law, or new regulations or guidance could be issued by the FDA. Such new legislation may result in new or increased regulatory requirements for OncoCyte to offer diagnostic tests or services.

If premarket review, including approval, is required, OncoCyte's business could be negatively affected until such review is completed and clearance to market or approval is obtained. If OncoCyte is selling diagnostic tests when new FDA approval requirements are implemented, OncoCyte may be required to suspend sales until premarket clearance or approval is obtained. If OncoCyte's diagnostic tests are allowed to remain on the market but there is uncertainty about the legal status of those tests, if OncoCyte is required by the FDA to label them investigational, or if labeling claims the FDA allows OncoCyte to make are limited, order levels for the use of OncoCyte tests may decline and reimbursement may be adversely affected.

FDA regulations could also require, among other things, additional clinical studies and submission of a premarket notification or filing a Premarket Approval ("PMA") application with the FDA. For example, LDTs with the same intended use as a cleared or approved companion diagnostic are defined in FDA's draft guidance as "high-risk LDTs (Class III medical devices)" for which premarket review would be required. This may include the use of LDTs for screening patients for cancer. See the discussion of FDA regulation of medical devices below under *In Vitro Diagnostics*. If premarket review is required by the FDA, there can be no assurance that OncoCyte's diagnostic tests will be cleared or approved on a timely basis, if at all, nor can there any be assurance that labeling claims allowed by the FDA will be consistent with OncoCyte's intended claims or will be adequate to support continued adoption of and reimbursement for the tests.

*California State Laboratory Licensing*

In addition to federal certification requirements of laboratories under CLIA, licensure will be required and maintained under California law for the San Francisco Bay Area based laboratory that OncoCyte plans to establish. Such laws include standards for the day-to-day operation of a clinical reference laboratory, including the training and skills required of personnel and quality control. In addition, California laws mandate proficiency testing, which involves testing of specimens that have been specifically prepared for the laboratory.

OncoCyte will not be permitted to perform diagnostic tests at the California CLIA laboratory it plans to build, until the laboratory is certified by the state, and if after certification the laboratory falls out of compliance with California standards, the California Department of Health Services ("DHS") may suspend, restrict or revoke the license to operate the laboratory, assess substantial civil money penalties, or impose specific corrective action plans.

*Other States' Laboratory Licensing*

Some states require licensure of out-of-state laboratories that accept specimens from those states. OncoCyte's laboratory will need to pass various state inspections in order to get licensed to provide LDTs in each of state that requires licensure. In addition to the inspection requirements of the other states, Pennsylvania, Florida and Maryland have laws that require a certificate of compliance, and New York has its own special inspection requirements that must be met, in order to market our diagnostics in those states or to perform diagnostic tests on specimens received from patients residing in those states.

*In Vitro Diagnostics*

In the future, OncoCyte may elect to develop IVDs, which are regulated by the FDA as medical devices. Medical devices marketed in the United States are subject to the regulatory controls under CLIA, the Federal Food, Drug, and Cosmetic Act, and regulations adopted by the FDA. Some requirements, known as premarket requirements, apply to medical devices before they are marketed, and other requirements, known as post-market requirements, apply to medical devices after they are marketed.

The premarket requirements that must be met to market a medical device in the United States will depend on the classification of the device under FDA regulations. Medical devices are categorized into one of three classes, based on the degree of risk they present. Devices that pose the lowest risk are designated as Class I devices, devices that pose moderate risk are designated as Class II devices and are subject to general controls and special controls, and the devices that pose the highest risk are designated as Class III devices and are subject to general controls and premarket approval.

A premarket submission to the FDA will be required for some Class I devices, most Class II devices, and all Class III devices. Most Class I and some Class II devices are exempt from premarket submission requirements. Some Class I and most Class II devices may only be marketed after a 510(k) premarket notification, while a more extensive PMA or Premarket Approval is required to market Class III devices.

Until all regulatory requirements are phased in our initial confirmatory diagnostics will not require FDA filing before launch. Since the tests are being developed as LDTs, the regulatory pathway that OncoCyte will be following is the CLIA certification and inspection pathway. If the new requirements are phased in or if OncoCyte elects to develop IVDs, those future screenings diagnostics may require a 510(k) submission or a PMA. In a 510(k) submission, the device sponsor must demonstrate that the new device is "substantially equivalent" to a predicate device in terms of intended use, technological characteristics, and performance testing. A 510(k) requires demonstration of substantial equivalence to another device that is legally marketed in the United States. Substantial equivalence means that the new device is at least as safe and effective as the predicate. A device is substantially equivalent if, in comparison to a predicate it (a) has the same intended use as the predicate; and has the same technological characteristics as the predicate; or (b) has the same intended use as the predicate; and has different technological characteristics and the information submitted to FDA; does not raise new questions of safety and effectiveness; and is demonstrated to be at least as safe and effective as the legally marketed predicate device.

If OncoCyte elects to develop IVDs, those future screenings diagnostics may require a 510(k) submission or a PMA. In a 510(k) submission, the device sponsor must demonstrate that the new device is "substantially equivalent" to a predicate device in terms of intended use, technological characteristics, and performance testing. A 510(k) requires demonstration of substantial equivalence to another device that is legally marketed in the United States. Substantial equivalence means that the new device is at least as safe and effective as the predicate. A device is substantially equivalent if, in comparison to a predicate it (a) has the same intended use as the predicate; and has the same technological characteristics as the predicate; or (b) has the same intended use as the predicate; and has different technological characteristics and the information submitted to FDA; does not raise new questions of safety and effectiveness; and is demonstrated to be at least as safe and effective as the legally marketed predicate device.

A claim of substantial equivalence does not mean the new and predicate devices must be identical. Substantial equivalence is established with respect to intended use, design, energy used or delivered, materials, chemical composition, manufacturing process, performance, safety, effectiveness, labeling, biocompatibility, standards, and other characteristics. A device may not be marketed in the United States until the submitter receives a letter declaring the device substantially equivalent. If the FDA determines that a device is not substantially equivalent, the applicant may resubmit another 510(k) with new data, or request a Class I or II designation through the FDA's *de novo* process that allows a new device without a valid predicate to be classified into Class I or II if it meets certain criteria, or file a reclassification petition, or submit a PMA.

A new 510(k) submission is required for changes or modifications to an existing approved device, where the modifications could significantly affect the safety or effectiveness of the device or the device is to be marketed for a new or different indication for use.

A PMA for Class III devices is the most stringent type of premarket submission. Before the FDA approves a PMA, the sponsor must provide valid scientific evidence demonstrating reasonable assurance of safety and effectiveness for the device's intended use.

Submission of an application is no guarantee that the CMS or FDA will find it complete and accept it for filing. If an application is accepted for filing or licensing, following the CMS or FDA's review, the CMS or FDA may grant marketing approval, request additional information or deny the application if it determines that the application does not provide an adequate basis for approval.

*Health Insurance Portability and Accountability Act*

Under the Health Insurance Portability and Accountability Act ("HIPAA"), the Department of Health and Human Services ("HHS") has issued regulations to protect the privacy and security of protected health information used or disclosed by health care providers, such as us. HIPAA also regulates standardization of data content, codes and formats used in health care transactions and standardization of identifiers for health plans and providers. Penalties for violations of HIPAA regulations include civil and criminal penalties.

CMS and the Office of Civil Rights issued a final rule in February 2014 to amend both the HIPAA and CLIA regulations. The final rule amended the HIPAA privacy rule to remove the CLIA laboratory exceptions, and as a result, HIPAA-covered laboratories are now required to provide individuals, upon request, with access to their completed test reports. Under the 2014 rules CLIA laboratories and CLIA-exempt laboratories may provide copies of a patient's completed test reports that, using the laboratory's authentication process, can be identified as belonging to that patient. These changes to the CLIA regulations and the HIPAA Privacy Rule provide individuals with a greater ability to access their health information, empowering them to take a more active role in managing their health and health care. CLIA laboratories must create and maintain policies, procedures, and other documentation necessary to inform patients of the right to access laboratory test reports and how to exercise that right.

The requirements under these regulations may periodically change and could have an effect on OncoCyte's business operations if compliance becomes substantially more costly than under current requirements. New laws governing privacy may also be adopted in the future. We can provide no assurance that OncoCyte will remain in compliance with diverse privacy requirements in all of the jurisdictions in which it does business. Failure to comply with privacy requirements could result in civil or criminal penalties, which could have a materially adverse effect on OncoCyte's business.

***Physician Referral Prohibitions***

Under a federal law directed at "self-referral," commonly known as the Stark Law, there are prohibitions, with certain exceptions, on Medicare and Medicaid payments for laboratory tests referred by physicians who personally, or through a family member, have a "financial relationship"—including an investment or ownership interest or a compensation arrangement—with the clinical laboratory performing the tests. Several Stark Law exceptions are relevant to arrangements involving clinical laboratories, including: (1) fair market value compensation for the provision of items or services; (2) payments by physicians to a laboratory for clinical laboratory services; (3) certain space and equipment rental arrangements that satisfy certain requirements, and (4) personal services arrangements that satisfy certain requirements. The laboratory cannot submit claims to the Medicare Part B program for services furnished in violation of the Stark Law, and Medicaid reimbursements may be at risk as well. Penalties for violating the Stark Law include the return of funds received for all prohibited referrals, fines, civil monetary penalties and possible exclusion from the federal health care programs. Many states have comparable laws that are not limited to Medicare and Medicaid referrals.

***Corporate Practice of Medicine***

A number of states, including California, do not allow business corporations to employ physicians to provide professional services. This prohibition against the "corporate practice of medicine" is aimed at preventing corporations such as OncoCyte from exercising control over the medical judgments or decisions of physicians. The state licensure statutes and regulations and agency and court decisions that enumerate the specific corporate practice rules vary considerably from state to state and are enforced by both the courts and regulatory authorities, each with broad discretion. If regulatory authorities or other parties in any jurisdiction successfully assert that OncoCyte is engaged in the unauthorized corporate practice of medicine, OncoCyte could be required to restructure its contractual and other arrangements. In addition, violation of these laws may result in sanctions imposed against OncoCyte and/or the professional through licensure proceedings, and OncoCyte could be subject to civil and criminal penalties that could result in exclusion from state and federal health care programs.

***Federal and State Fraud and Abuse Laws***

A variety of federal and state laws prohibit fraud and abuse. These laws are interpreted broadly and enforced aggressively by various state and federal agencies, including CMS, the Department of Justice, the Office of Inspector General for HHS, and various state agencies. In addition, the Medicare and Medicaid programs increasingly use a variety of contractors to review claims data and to identify improper payments as well as fraud and abuse. These contractors include Recovery Audit Contractors, Medicaid Integrity Contractors and Zone Program Integrity Contractors. In addition, CMS conducts Comprehensive Error Rate Testing audits, the purpose of which is to detect improper Medicare payments. Any overpayments identified must be repaid unless a favorable decision is obtained on appeal. In some cases, these overpayments can be used as the basis for an extrapolation, by which the error rate is applied to a larger universe of claims, and which can result in even higher repayments.

The federal Anti-Kickback Statute prohibits, among other things, knowingly and willfully offering, paying, soliciting, receiving, or providing remuneration, directly or indirectly, to induce or in return for either the referral of an individual, or the furnishing, recommending, or arranging for the purchase, lease or order of any health care item or service reimbursable, in whole or in part, under a federal health care program. The definition of "remuneration" has been broadly interpreted to include anything of value, including gifts, discounts, credit arrangements, payments of cash, ownership interests and providing anything at less than its fair market value. Recognizing that the Anti- Kickback Statute is broad and may technically prohibit many innocuous or beneficial arrangements within the health care industry, the Office of Inspector General for HHS has issued a series of regulatory "safe harbors." These safe harbor regulations set forth certain requirements that, if met, will assure immunity from prosecution under the federal Anti-Kickback Statute. Although full compliance with these provisions ensures against prosecution under the federal Anti-Kickback Statute, the failure of a transaction or arrangement to fit within a specific safe harbor does not necessarily mean that the transaction or arrangement is illegal or that prosecution under the federal Anti-Kickback Statute will be pursued.

HIPAA also created new federal crimes, including health care fraud and false statements relating to health care matters. The health care fraud statute prohibits knowingly and willfully executing a scheme to defraud any health care benefit program, including private third-party payers. A violation of this statute is a felony and may result in fines, imprisonment or exclusion from federal health care programs, such as the Medicare and Medicaid programs. The false statements statute prohibits knowingly and willfully falsifying, concealing or covering up a material fact or making any materially false, fictitious or fraudulent statement in connection with the delivery of or payment for health care benefits, items or services. A violation of this statute is a felony and may result in fines, imprisonment or exclusion from federal health care programs.

Many states have laws similar to the federal laws described above and the state laws may be broader in scope and may apply regardless of payor.

**Reimbursement**

***Medicare, Medicaid, and Similar Reimbursement Programs***

Sales of the therapeutic products and diagnostic tests that we and our subsidiaries plan to offer will depend, in part, on the extent to which the costs of those products or tests will be covered by third-party payors, such as government health programs, commercial insurance, and managed healthcare organizations.

The containment of healthcare costs has become a priority of federal and state governments and the prices of drugs have been a focus in this effort. In the United States, the federal and many state governments have adopted or proposed initiatives relating to Medicaid and other health programs that may limit reimbursement or increase rebates that providers are required to pay to the state. Medicare for example, currently requires a 2% reduction to Medicare payment rates to providers due to federal budget cuts referred to as "sequestration". In addition to government regulation, managed care organizations in the United States, which include medical insurance companies, medical plan administrators, health-maintenance organizations, hospital and physician alliances and pharmacy benefit managers, continue to put pressure on the price and usage of healthcare products. Managed care organizations seek to contain healthcare expenditures, and their purchasing strength has been increasing due to their consolidation into fewer, larger organizations and a growing number of enrolled patients. Adoption of price controls and cost-containment measures, and adoption of more restrictive policies in jurisdictions with existing controls and measures, could further limit our net revenue and results. If third-party payors do not consider our products to be cost-effective compared to other therapies or diagnostic tests, they may not cover our products or diagnostic tests as a benefit under their plans or, if they do, the level of payment may not be sufficient to allow us to sell our products on a profitable basis.

***Therapeutic Products: Third- Party Reimbursement***

Sales of products are dependent on the availability and extent of coverage and reimbursement from third-party payers. In many markets around the world, these payers, including government health systems, private health insurers and other organizations, continue to be focused on reducing the cost of healthcare. Their efforts have intensified as a result of rising healthcare costs and economic challenges. Drugs, and in particular specialty drugs such as our products, remain a focus for cost containment by these parties. As a result, payers around the world are being more restrictive regarding the use of biopharmaceutical products while requiring a higher level of clinical evidence to support the benefit such products bring to patients and the broader healthcare system. The scrutiny of biopharmaceutical pricing in the United States remains intense and a point of focus in the discussion of rising healthcare costs. The pricing practices of certain companies have increased public media and government scrutiny of the biopharmaceutical industry, providing greater incentive for governments and private payers to limit or regulate the price of drug products and services. At the same time, value assessments of new technology, previously used predominantly outside the United States, are having an impact in the U.S. healthcare environment. Healthcare provider organizations and independent organizations are creating their own value assessments of biopharmaceutical drugs for comparison with manufacturer pricing. Although these organizations do not set drug prices, they seek to influence pricing as well as payer and provider decision making by publicly disclosing their assessments, often making assertions around what they believe to be the appropriate price to charge for a product. These developments put greater pressure on access to, pricing of and sales of products.

In the United States, healthcare providers are reimbursed for covered services and products they deliver through Medicare, Medicaid and other government healthcare programs, as well as through private payers. Pharmacies are also reimbursed in a similar manner for drug products they dispense. We may be required to provide specified rebates or discounts on the products we sell to certain government funded programs, including Medicare and Medicaid, and those rebates or discounts have increased over time. The Patient Protection and Affordable Care Act (ACA), enacted in 2010, increased many of the mandatory discounts and rebates required of us and imposed a new Branded Prescription Pharmaceutical Manufacturers and Importers fee payable each year by us and other manufacturers. The new U.S. presidential administration has identified repealing and replacing the ACA as a priority. On March 6, 2017, the American Health Care Act ("AHCA") was introduced as the new administration's proposed replacement of ACA. The timing and method of repeal of the ACA and adoption of the AHCA remains uncertain, but impending changes will likely impact the number of patient lives covered, the quality of the insurance, Medicaid eligibility and the level of patient protections provided.

Further efforts by government agencies and state legislatures in the United States could also affect us and our industry. For example, a recently enacted Vermont law requires manufacturers to submit price increase justifications to the state attorney general if certain price increase and state spending thresholds are met. Examples of other proposals that have been discussed and debated, but not yet enacted, include state ballot initiatives that would place a maximum price ceiling, or cap, on pharmaceutical products purchased by state agencies and state legislative efforts to cap pharmaceutical prices for commercial payers. Other legislative and regulatory actions that would have a significant impact include: changes to how the Medicare program covers and reimburses current and future drugs, changes in the Federal payment rate or new rebate requirements for covered drugs and policies for payment in Medicare or Medicaid; and changes to coverage and payment for biosimilars, including the current Medicare biosimilar coverage and payment policies intended to encourage biosimilar adoption, or other policies that provide easier substitution or reimbursement advantages.

In the U.S. private sector, healthcare providers and payers continue to institute cost reduction and containment measures that lower drug spending altogether or shift a greater portion of the costs to patients. Such measures include more limited benefit plan designs, higher tier formulary placement that increases the level of patient out of pocket costs and stricter utilization criteria before a patient may get access to a drug. In the retail pharmacy sector, the use of such measures by Pharmacy Benefit Managers (PBMs) and insurers has continued to intensify which have limited product usage and revenues industry wide. PBMs are third-party organizations tasked with administrating prescription drug programs for large employers, health plans and government programs. Consolidation has resulted in a smaller number of PBMs and insurers overseeing a large portion of total covered lives in the United States; for example, three PBMs oversee approximately 75% of covered lives in the United States. As a result, PBMs and insurers have greater market power and negotiating leverage to exclude drugs from their formularies in favor of competitor drugs or alternative treatments, and/or to mandate stricter utilization criteria. Formulary exclusion effectively encourages patients and providers to seek alternative treatments or pay 100% of the cost of a drug. Utilization management requirements continue to be onerous for patients and physicians, limiting access to appropriate usage. In highly competitive treatment markets PBMs are also able to exert negotiating leverage by requiring incremental rebates from manufacturers in order to maintain their formulary position. A drug's favorable position on formulary is essential to ensure patients have access.

We face similar issues outside of the United States. In some non-U.S. jurisdictions, the proposed pricing for a drug must be approved before it may be lawfully marketed. The requirements governing drug pricing vary widely from country to country. For example, the EU provides options for its member states to restrict the range of medicinal products for which their national health insurance systems provide reimbursement and to control the prices of medicinal products for human use. A member state may approve a specific price for the medicinal product or it may instead adopt a system of direct or indirect controls on the profitability of the company placing the medicinal product on the market. There can be no assurance that any country that has price controls or reimbursement limitations for pharmaceutical products will allow favorable reimbursement and pricing arrangements for any of our products. Historically, products launched in the EU do not follow price structures of the United States and generally tend to be significantly lower.

***Diagnostic Tests: Third-Party Billing, Coverage, and Reimbursement***

OncoCyte will face additional third-party reimbursement challenges for the diagnostic tests that it plans to provide. Revenues from OncoCyte's clinical laboratory testing will be derived from several different sources. Depending on the billing arrangement, the instruction of the ordering physician and applicable law, parties that may reimburse OncoCyte for its services include:

- Third-party payers that provide coverage to the patient, such as an insurance company, a managed care organization or a governmental payer program;
- Physicians or other authorized parties, such as hospitals or independent laboratories, that order the testing service or otherwise refer the testing services to OncoCyte; or
- Patients in cases where the patient has no insurance, has insurance that partially covers the testing, or owes a co-payment, co-insurance or deductible amount.

*Medicare*

We expect that a substantial portion of the patients for whom OncoCyte may perform diagnostic tests will have Medicare as their primary medical insurance. We cannot assure that, without Medicare reimbursement OncoCyte's planned tests will produce sufficient revenues to enable OncoCyte to reach profitability and achieve its other commercial objectives.

Clinical diagnostic laboratory tests are generally reimbursed under the Medicare Clinical Laboratory Fee Schedule ("CLFS") and reimbursement under the Medicare program for the diagnostic tests that OncoCyte will offer is based on the CLFS.

Medicare has coverage policies that can be national or regional in scope. Coverage means that the test is approved as a benefit for Medicare beneficiaries. If there is no coverage, neither OncoCyte nor any other party, such as a reference laboratory, may receive reimbursement from Medicare for the service.

*Legislative and Regulatory Changes Impacting Medicare Reimbursements*

From time to time, Congress has revised the Medicare statute and the formulas it establishes for the CLFS. The payment amounts under the Medicare fee schedules are important because they not only will determine OncoCyte's reimbursement under Medicare, but those payment amounts are also often used as a basis for payment amounts set by other governmental and private third-party payers. For example, state Medicaid programs are prohibited from paying more than the Medicare fee schedule limit for clinical laboratory services furnished to Medicaid recipients.

The Protecting Access to Medicare Act of 2014 ("PAMA"), enacted April 1, 2014 overhauls the CLFS payment methodology and imposes a market-based reimbursement system. PAMA provides that, in general payment for clinical diagnostic laboratory tests ("CLDTs") will be equal to the weighted median of private payer rates for the test, based on data reported by certain laboratories during a specified collection period. PAMA requires a similar rate adjustment and reporting requirement for advanced diagnostic laboratory tests ("ADLTs"). ADLTs are CDLTs furnished by a single laboratory, not sold for use by other entities, and meeting at least one of the following criteria:

- Analysis of multiple biomarkers of DNA, RNA or proteins combined with a unique algorithm to yield a single patient-specific result;
- Cleared or approved by the FDA; or
- Meets other similar criteria established by the Secretary of Health and Human Services.
- The tests OncoCyte will offer will most likely be classified as CDLTs.

On June 23, 2016, the CLFS final rule entitled "Medicare Program: Medicare Clinical Diagnostic Laboratory Test Payment System" ("Final Rule") set out the details of the payment policy mandated by PAMA and set an effective date of January 1, 2018 for the shift in payment rates. PAMA and the Final Rule will significantly impact the way that laboratory tests are reimbursed by Medicare. CMS estimates that the Final Rule will result in a reduction of approximately $390 million, or 5.6%, in Medicare spending on clinical laboratory tests in federal fiscal year 2018 and nearly $4 billion over the course of 10 years.

Beginning January 1, 2017, Medicare payment for any new ADLT will be based on the list price or charge. After the test is commercially available for three quarters, the laboratory will be required to report payment and volume information and this data will be used to set payment for the test for the following year.

- If data shows that the list price was greater than 130% of the payment using established methodology, generally a weighted median, CMS will recoup the difference from the laboratory through a payment claw back.
- Payment will be updated annually based on the weighted median of commercial payer reimbursement.

Congress has proposed on several occasions to impose a 20% coinsurance charge on patients for CLDTs reimbursed under the CLFS, which would require OncoCyte to bill patients for these amounts. Because of the relatively low reimbursement for many CLDTs, in the event that Congress were to ever enact such legislation, the cost of billing and collecting for these services would often exceed the amount actually received from the patient and effectively increase OncoCyte's costs of billing and collecting.

Some Medicare claims may be subject to policies issued by the Medicare Administrative Contractor ("MAC") for California. CMS relies on a network of MACs to process Medicare claims, and MACs serve as the primary operational contact between the Medicare Fee-For-Service program and approximately 1.5 million health care providers enrolled in the program. The predecessor to the current California MAC, acting on behalf of many MACs, issued a Local Coverage Determination that affects coverage, coding and billing of many molecular diagnostic tests. Under this Local Coverage Determination, the MAC took the position that it would not cover any molecular diagnostic test unless the test is expressly included in a National Coverage Determination issued by CMS, or a Local Coverage Determination, or coverage article issued by the MAC. Denial of coverage for our diagnostic tests by the current California MAC, Noridian Healthcare Solutions, or reimbursement at inadequate levels, would have a material adverse impact on our business and on market acceptance of OncoCyte's planned diagnostic tests.

***Private and Governmental Third Party Payers***

Where there is a private or governmental third-party payer coverage policy in place, OncoCyte will bill the payer and the patient in accordance with the established policy. Where there is no coverage policy in place, OncoCyte will pursue reimbursement on a case-by-case basis. OncoCyte's efforts in obtaining reimbursement based on individual claims, including pursuing appeals or reconsiderations of claims denials, could take a substantial amount of time, and bills may not be paid for many months, if at all. Furthermore, if a third-party payer denies coverage after final appeal, OncoCyte may not receive payment at all.

Reimbursement rates paid by private third-party payers can vary based on whether the provider is an "in-network" provider, a participating provider, a covered provider, an "out-of-network" provider or a non-participating provider. These definitions can vary among payers. An in-network provider usually has a contract with the payor or benefits provider. This contract governs, among other things, service-level agreements and reimbursement rates. In certain instances, an insurance company may negotiate an in-network rate for OncoCyte's testing. An in-network provider may have rates that are lower per test than those that are out-of-network, and that rate can vary widely. Rates vary based on the payor, the testing type and often the specifics of the patient's insurance plan. If a laboratory agrees to contract as an in-network provider, it generally expects to receive quicker payment and access to additional covered patients. However, it is likely that OncoCyte will initially be considered an "out-of-network" or non-participating provider by payers who cover the vast majority of patients until such time that OncoCyte can negotiate contracts with these payers.

We cannot predict whether, or under what circumstances, payers will reimburse for all components of OncoCyte's tests. Full or partial denial of coverage by payers, or reimbursement at inadequate levels, would have a material adverse impact on OncoCyte's business and on market acceptance of OncoCyte's diagnostic tests.

***Direct Billing Laws and Other State Law Restrictions on Billing for Laboratory Services***

Laws and regulations in certain states prohibit laboratories from billing physicians or other purchasers for testing that they order. Some states may allow laboratories to bill physicians directly but may prohibit the physician and, in some cases, other purchasers from charging more than the purchase price for the services, or may allow only for the recovery of acquisition costs, or may require disclosure of certain information on the invoice. In some cases, and if not prohibited by law or regulation, OncoCyte may bill physicians, hospitals and other laboratories directly for the services that they order. An increase in the number of states that impose similar restrictions could adversely affect OncoCyte by encouraging physicians to perform laboratory services in-house or by causing physicians to refer services to other laboratories that are not subject to the same restrictions.

**Employees**

As of December 31, 2016, we employed one hundred two employees (102), of which forty (40) are BioTime employees and sixty-two are employees of our subsidiaries (including OncoCyte and excluding Asterias), and one hundred (100) are on a full-time basis and two (2) persons on a part-time basis. Twenty-six (26) full-time employees hold Ph.D. degrees in one or more fields of science. None of our employees are covered by a collective bargaining agreement.

## Item 1A. Risk Factors

Our business is subject to various risks, including those described below. You should consider the following risk factors, together with all of the other information included in this report, which could materially adversely affect our proposed operations, our business prospects, and financial condition, and the value of an investment in our business. There may be other factors that are not mentioned here or of which we are not presently aware that could also affect our business operations and prospects. Those of our subsidiaries and other affiliates within the BioTime Family of Companies that are developing therapeutic products derived from pluripotent stem cells will face substantially the same kind of risks that affect our business, as well as the risks related to our industry generally.

## Risks Related to Our Business Operations

**We have incurred operating losses since inception and we do not know if we will attain profitability**

Our total operating losses for the fiscal years ended December 31, 2016, 2015, and 2014 were $59 million, $65.8 million, and $50.7 million respectively, and we had an accumulated deficit of $196 million, as of December 31, 2016. We primarily finance our operations through the sale of equity securities, research grants, licensing fees, royalties on product sales by our licensees, and subscription fees and advertising revenue from database products. Ultimately, our ability to generate sufficient operating revenue to earn a profit depends upon our success in developing and marketing or licensing our products, diagnostic tests, and technology. As a developer of therapeutic products derived from pluripotent stem cells, Asterias will face substantially the same kind of risks that affect our business, as well as the risks related to our industry generally.

**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**

- Many of our experimental products and technologies have not been applied in human medicine and have only been used in laboratory studies *in vitro* or in animals. These new products and technologies might not prove to be safe and efficacious in the human medical applications for which they were developed.

- The experimentation we are doing is costly, time consuming, and uncertain as to its results. We incurred research and development expenses amounting to $36.1 million, $42.6 million, and $37.5 million during the years ended December 31, 2016, 2015, and 2014, respectively.

- 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. We may not have the financial resources to fund clinical trials on our own and we may have to enter into licensing or collaborative arrangements with other companies or we may discontinue one or more of the research or product development programs. Any such arrangements may be dilutive to our ownership or economic interest in the products.

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

- Sales of *Hextend*® have already been adversely impacted by the availability of other products that are commonly used in surgery and trauma care and sell at low prices.

- Ocata, which was recently acquired by a subsidiary of Astellas Pharma, Inc. for $379 million, is conducting clinical trials of a pluripotent stem cell product designed to treat AMD. If the Ocata product is proven to be safe and effective, it may reach the market ahead of *OpRegen*® Moreover, Ocata was recently issued a patent pertaining to the manufacture of RPE products that could adversely impact the rights of Cell Cure to manufacture *OpRegen*®.

- 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.

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

- We and the other members of the BioTime Family of Companies, including Asterias and OncoCyte, plan to continue to incur substantial research and product development expenses and will need to raise additional capital to pay operating expenses.

- The ability of BioTime, Asterias and OncoCyte to raise additional equity or debt capital will depend, not only on progress made in developing new products and technologies, but also on access to capital and conditions in the capital markets. There is no assurance that we or Asterias and OncoCyte will be able to raise capital at times and in amounts needed to finance product development, clinical trials, and general operations. Even if capital is available, it may not be available on terms that we or our shareholders would consider favorable.

- Sales of additional equity securities by us or our subsidiaries could result in the dilution of the interests of present shareholders.

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

- Pluripotent stem 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 pluripotent stem cells or other cells or products derived from pluripotent stem or other cells, we will need to develop processes and technology for the commercial production of those products.

- Pluripotent stem 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. We may not be able to sell our products in sufficient volumes to recover our costs or to earn a profit.

**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 clinical trial patients if they incur any injuries as a result of their participation in the clinical trials. We will also be obligated to obtain information and prepare reports about the health of the clinical trial patients. We are not aware of any claims by patients alleging injuries suffered as a result of any of our clinical trials, but if any claims are made and if liability can be established, the amount of any liability that we or our subsidiaries may incur, could exceed any insurance coverage that we or our subsidiaries may obtain, 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**

BioTime stem cell research programs, and to a lesser extent, the programs of BioTime's subsidiaries, are directed primarily by our Co-Chief Executive Officers, Dr. Michael West and Adi Mohanty. BioTime's subsidiaries are directed by their respective management teams. The loss of the services of Dr. West, Mr. Mohanty or other members of senior management of BioTime or of our subsidiaries could have a material adverse effect on us.

**If we make strategic acquisitions, we will incur a variety of costs and might never realize the anticipated benefits**

If appropriate opportunities become available, we might attempt to acquire approved products, additional drug candidates, technologies, or businesses that we believe are a strategic fit with our business. If we pursue any transaction of that sort, the process of negotiating the acquisition and integrating an acquired product, drug candidate, technology, or business might result in operating difficulties and expenditures and might require significant management attention that would otherwise be available for ongoing development of our business, whether or not any such transaction is ever consummated. Moreover, we might never realize the anticipated benefits of any acquisition. Future acquisitions could result in potentially dilutive issuances of equity securities, the incurrence of debt, contingent liabilities, or impairment expenses related to goodwill, and impairment or amortization expenses related to other intangible assets, which could harm our financial condition.

**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. 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. Operating our business through subsidiaries, some of which are located in foreign countries, also adds to the complexity of our internal control over financial reporting and adds to the risk of a system failure, an undetected improper use or expenditure of funds or other resources by a subsidiary, or a failure to properly report a transaction or financial results of a subsidiary. We allocate certain expenses among BioTime itself and one or more of our subsidiaries, which creates a risk that the allocations we make may not accurately reflect the benefit of an expenditure or use of financial or other resources by BioTime as the parent company and the subsidiaries among which the allocations are made. An inaccurate allocation may impact our consolidated financial results, particularly in the case of subsidiaries that we do not wholly own since our financial statements include adjustments to reflect the minority ownership interests in our subsidiaries held by others.

**Our business and operations could suffer in the event of computer 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.

## 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 biotechnology and pharmaceutical 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 is the case with larger companies possessing substantial income and available capital.

**If we do not receive regulatory approvals we will not be permitted to sell our therapeutic and medical device products**

The therapeutic and medical device products that we and our subsidiaries develop cannot be sold until the FDA and corresponding foreign regulatory authorities approve the products for medical use. 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 pharmaceutical or 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 and regulatory changes that could delay, limit, or prevent regulatory agency approvals.
- Because the therapeutic products we are developing with pluripotent stem cell 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 biologicals derived from other technologies.
- A product that is approved may be subject to restrictions on use.
- The FDA can recall or withdraw approval of a product, if it deems necessary.
- 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 product candidates**

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 patients due to competition for patients from other trials;
- negative or inconclusive results from clinical trials;
- unforeseen side effects, possibly resulting in the FDA or other regulatory authorities denying approval of our product candidates;
- 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 patients adequately during or after treatment or problems with investigator or patient compliance with the trial protocols;
- 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 about 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 in research and development in the United States and abroad could generally constrain stem cell research, thereby limiting the market and demand for our products. During March 2009, President 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 (NIH) 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. The 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.

California law requires that stem cell research be conducted under the oversight of a stem cell review oversight committee (SCRO). 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 that we plan to do.

The use of hES cells may give rise to religious, moral, and ethical issues. These considerations could lead to more restrictive government regulations or could generally constrain stem cell research, thereby limiting the market and demand for our products.

**If we are unable to obtain and enforce patents and to protect our trade secrets, others could use our technology to compete with us, which could limit opportunities for us to generate revenues by licensing our technology and selling products**

- Our success will depend in part on our ability to obtain and enforce patents and maintain trade secrets in the United States and in other countries. If we are unsuccessful at obtaining and enforcing patents, our competitors could use our technology and create products that compete with our products, without paying license fees or royalties to us.
- The preparation, filing, and prosecution of patent applications can be costly and time consuming. Our limited financial resources may not permit us to pursue patent protection of all of our technology and products in all key markets.
- Even if we are able to obtain issued patents covering our technology or products, we may have to incur substantial legal fees and other expenses to enforce our patent rights to protect our technology and products from infringing uses. We may not have the financial resources to finance the litigation required to preserve our patent and trade secret rights.
- Litigation, interferences, oppositions, inter partes reviews or other proceedings are, have been and may in the future be necessary in some instances to determine the validity and scope of certain of our proprietary rights, and in other instances to determine the validity, scope or non-infringement of certain patent rights claimed by third parties to be pertinent to the manufacture, use or sale of our products. This means that patents owned or licensed by us may be lost if the outcome of a proceeding is unfavorable to us.

**There is no certainty that our pending or future patent applications will result in the issuance of patents**

Our success depends in part on our ability to obtain and defend patent and other intellectual property rights that are important to the commercialization of our products and product candidates. The degree of patent protection that will be afforded to our products and processes in the U.S. and in other important markets remains uncertain and is dependent upon the scope of protection decided upon by the patent offices, courts, administrative bodies and lawmakers in these countries. We can provide no assurance that we will successfully obtain or preserve patent protection for the technologies incorporated into our products and processes, or that the protection obtained will be of sufficient breadth and degree to protect our commercial interests in all countries where we conduct business. If we cannot prevent others from exploiting our inventions, we will not derive the benefit from them that we currently expect. Furthermore, we can provide no assurance that our products will not infringe patents or other intellectual property rights held by third parties.

In Europe, there is uncertainty about the eligibility of hES cell subject matter for patent protection. The European Patent Convention prohibits the granting of European patents for inventions that concern "uses of human embryos for industrial or commercial purposes." A recent decision at the Court of Justice of the European Union interpreted parthenogenetically produced hES cells as patentable subject matter. Consequently, the European Patent Office now recognizes that human pluripotent stem cells (including human ES cells) can be created without a destructive use of human embryos as of June 5, 2003, and patent applications relating to hES cell subject matter with a filing and priority date after this date are no longer automatically excluded from patentability under Article 53 (a) EPC and Rule 28(c) EPC.

**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 depends on several critical technologies that are based in part on technology licensed from third parties. 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 any capital that we might then need, 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 our products and diagnostic tests may be limited by health insurance coverage and government regulation**

Success in selling our pharmaceutical and cell-based products, medical devices, and diagnostic tests 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, tests, and related treatment. Until we introduce a new product or diagnostic test into the medical marketplace, we will not know with certainty whether adequate health insurance, HMO, and government coverage will be available to permit the product or test 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 ACA and future changes to that law may adversely affect our business**

As a result of the adoption of the ACA, in the United States, substantial changes have been made to the system for paying for healthcare in the United States. 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. Certain provisions related to cost-savings and reimbursement measures could adversely affect our future financial performance.

**If we fail to comply with the extensive legal and regulatory requirements affecting the health care industry, we could face increased costs, penalties and a loss of business**

Our activities, and the activities of the BioTime Family of Companies, our collaborators, distributors and other third-party providers, are subject to extensive government regulation and oversight both in the U.S. and in foreign jurisdictions. The FDA and comparable agencies in other jurisdictions directly regulate many of our most critical business activities, including the conduct of preclinical and clinical studies, product manufacturing, advertising and promotion, product distribution, adverse event reporting and product risk management. Our interactions in the U.S. or abroad with physicians and other health care providers that prescribe or purchase our products are also subject to government regulation designed to prevent fraud and abuse in the sale and use of the products and place greater restrictions on the marketing practices of health care companies. Health care companies such as ours are facing heightened scrutiny of their relationships with health care providers from anti-corruption enforcement officials. In addition, health care companies such as ours have been the target of lawsuits and investigations alleging violations of government regulation, including claims asserting submission of incorrect pricing information, impermissible off-label promotion of pharmaceutical products, payments intended to influence the referral of health care business, submission of false claims for government reimbursement, antitrust violations or violations related to environmental matters. Risks relating to compliance with laws and regulations may be heightened as we continue to operate globally.

Regulations governing the health care industry are subject to change, with possibly retroactive effect, including:

- new laws, regulations or judicial decisions, or new interpretations of existing laws, regulations or decisions, related to health care availability, pricing or marketing practices, compliance with wage and hour laws and other employment practices, method of delivery, payment for health care products and services, compliance with health information and data privacy and security laws and regulations, tracking and reporting payments and other transfers of value made to physicians and teaching hospitals, extensive anti-bribery and anti-corruption prohibitions, product serialization and labeling requirements and used product take-back requirements;
- changes in the FDA and foreign regulatory approval processes that may delay or prevent the approval of new products and result in lost market opportunity;
- requirements that provide for increased transparency of clinical trial results and quality data, such as the EMA's clinical transparency policy, which could impact our ability to protect trade secrets and competitively-sensitive information contained in approval applications or could be misinterpreted leading to reputational damage, misperception or legal action which could harm our business; and
- changes in FDA and foreign regulations that may require additional safety monitoring, labeling changes, restrictions on product distribution or use, or other measures after the introduction of our products to market, which could increase our costs of doing business, adversely affect the future permitted uses of approved products, or otherwise adversely affect the market for our products.

Violations of governmental regulation may be punishable by criminal and civil sanctions against us, including fines and civil monetary penalties and exclusion from participation in government programs, including Medicare and Medicaid, as well as against executives overseeing our business. In addition to penalties for violation of laws and regulations, we could be required to repay amounts we received from government payors, or pay additional rebates and interest if we are found to have miscalculated the pricing information we have submitted to the government. We cannot ensure that our compliance controls, policies and procedures will in every instance protect us from acts committed by our employees, collaborators, partners or third-party providers that would violate the laws or regulations of the jurisdictions in which we operate. Whether or not we have complied with the law, an investigation into alleged unlawful conduct could increase our expenses, damage our reputation, divert management time and attention and adversely affect our business.

## Risks Related to our Dependence on Third Parties

**Asterias could lose its CIRM grant if Asterias fails to meet the clinical trial milestones that are a condition to CIRM's obligation to provide funding**

Asterias depends on its grant from CIRM as a source of financing for the costs of conducting its Phase I/IIa clinical trial and process development of AST-OPC1. Under the terms of the CIRM grant, Asterias must meet certain efficacy and progress milestones pertaining to the clinical trial. If Asterias fails to meet any of the milestones within the specified time frame, CIRM may discontinue providing grant funds to Asterias, which could force Asterias to postpone, delay, or discontinue the clinical trial and development work for the product.

**We may become dependent on possible future collaborations to develop and commercialize many of our product candidates and to provide the 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 and product marketing agreements to develop and commercialize our products. The expected 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. A collaborative arrangement upon which we might depend might be terminated by our collaboration partner or a partner 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, 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 such development and commercialization on our own.

**We may need to rely on marketing partners or contract sales companies**

Even if we are able to develop our products and obtain necessary regulatory approvals, we may choose to partner on one or more products for marketing, selling or distributing our products. If we do not partner for commercial services, we and our subsidiaries will be dependent on our ability to build our own marketing and distribution capability for our new products, which would require the investment of significant financial and management resources, or we will need to find collaborative marketing partners or 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 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 product candidates**

We will need to rely on third parties, such as 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 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 our 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 product candidates.

**Risks Related to OncoCyte's Business Operations**

OncoCyte has determined that the initial diagnostic tests that it plans to develop and commercialize will be LDTs that will be performed at a diagnostic laboratory that OncoCyte plans to operate. The decision to develop and commercialize LDTs will give rise to certain risks related to the operation of the business of operating a diagnostic laboratory and performing LDTs, including the following risks.

**OncoCyte will need to obtain regulatory approval of its diagnostic laboratory facilities**

OncoCyte will need to receive certification for its planned diagnostic laboratory under the CLIA. In addition to meeting federal regulatory requirements, each state has its own laboratory certification and inspection requirements for a CLIA laboratory that must be met in order to sell diagnostic tests in the state. CLIA licensed laboratories can lose their licenses if problems arise during periodic regulatory inspections.

**The FDA may impose additional regulations for laboratory developed tests such as the ones OncoCyte is developing**

The FDA issued two draft guidance documents and a discussion paper that set forth a proposed risk-based regulatory framework that would apply varying levels of FDA oversight to LDTs such as those OncoCyte is developing. If the FDA implements the new regulatory measures set forth in these documents:

- OncoCyte may be required to obtain pre-market clearance or approval before selling its diagnostic tests;
- As a result of required FDA pre-market review, OncoCyte's tests may not be cleared or approved on a timely basis, if at all;
- FDA labeling requirements may limit OncoCyte's claims about its diagnostic tests, which may have a negative effect on orders from physicians;
- The regulatory approval process may involve, among other things, successfully completing additional clinical trials and making a 510(k) submission, or filing a pre-market approval application with the FDA; and,
- If regulatory actions affect any of the reagents OncoCyte obtain from suppliers and use in conducting its tests, its business could be adversely affected in the form of increased costs of testing or delays, limits or prohibitions on the purchase of reagents necessary to perform its testing.

**OncoCyte will depend on Medicare and a limited number of private payers for a significant portion of its revenues, and its revenues could decline if these payers fail to provide timely and adequate payment for its diagnostic tests**

OncoCyte expects that a substantial portion of the patients for whom it will perform diagnostic tests will have Medicare as their primary medical insurance. Even if OncoCyte's planned tests are otherwise successful, reimbursement for the Medicare-covered portions of its planned tests might not, without Medicare reimbursement, produce sufficient revenues to enable it to reach profitability and achieve its other commercial objectives. It generally takes two to three years to obtain Medicare coverage and other third party reimbursement approvals for a new LDT and there can be no assurance OncoCyte will obtain such approvals for any of the cancer diagnostics that it is developing. Until a new cancer diagnostic test is accepted by third party payers for reimbursement, OncoCyte will have to market the test to physicians on a patient pay basis. In the absence of reimbursement by Medicare, patients who would be candidates for the use of OncoCyte's diagnostic tests and who rely on Medicare coverage may decline to use those tests, and physicians may be reluctant to prescribe the tests, due to the cost of the test to the patients. Because of this patient cost factor, revenues from any new cancer test that OncoCyte markets will experience slow growth until the test is approved for reimbursement in an amount commensurate with the cost to the patient.

Medicare and other third-party payers may change their coverage policies or cancel future contracts with OncoCyte at any time; review and adjust the rate of reimbursement; or stop paying for OncoCyte's tests altogether, which would reduce OncoCyte's total revenues. Payers have increased their efforts to control the cost, utilization, and delivery of health care services, and have undertaken measures to reduce payment rates for and decrease utilization of clinical laboratory testing. Because of the cost-trimming trends, any third-party payers that will cover and provide reimbursement for diagnostic tests may suspend, revoke or discontinue coverage at any time, or may reduce the reimbursement rates payable to OncoCyte. Any such action could have a negative impact on OncoCyte's revenues, which may have a material adverse effect on its financial condition, results of operations and cash flows.

**Changes in healthcare laws and policies may have a material adverse effect on OncoCyte's financial condition, results of operations and cash flows**

The ACA substantially changed the way health care is financed by both governmental and private insurers. Among the ACA's key changes, the ACA reduced payment rates under the Medicare Clinical Laboratory Fee Schedule and established an Independent Payment Advisory Board to reduce the per capita rate of growth in Medicare spending if spending exceeds a target growth rate. Such provisions may negatively impact payment rates for OncoCyte's diagnostic tests. The new U.S. presidential administration has identified repealing and replacing the ACA as a priority. On March 6, 2017, the American Health Care Act ("AHCA") was introduced as the new administration's proposed replacement of ACA. The timing and method of repeal of ACA and adoption of the AHCA remains uncertain, but impending changes will likely impact the number of patient lives covered, the quality of the insurance, Medicaid eligibility and the level of patient protections provide.

The Protecting Access to Medicare Act of 2014 ("PAMA") significantly altered the payment methodology under the Clinical Laboratory Fee Schedule that determines Medicare coverage for laboratory tests. Under PAMA, clinical laboratories are required to report test payment data for each Medicare-covered clinical diagnostic lab test and beginning in 2017, the Medicare payment rate for each clinical diagnostic lab test will be equal to the weighted median amount for the test from the most recent data collection period.

Congress has proposed on several occasions to impose a 20% coinsurance payment requirement on patients for clinical laboratory tests reimbursed under the Medicare Clinical Laboratory Fee Schedule, which would require OncoCyte to bill patients for these amounts. In the event that Congress were to ever enact such legislation, the cost of billing and collecting for OncoCyte's tests could often exceed the amount actually received from the patient.

Beginning January 1, 2017, Medicare payment for any new advanced diagnostic test will be based on the list price or charge. After the test is commercially available for three quarters, the laboratory will be required to report payment and volume information and that data will be used to set payment for the test for the following year.

- If data shows that the list price was greater than 130% of the payment using established methodology (a weighted median), CMS will recoup the difference from the laboratory through a payment claw back.
- Payment will be updated annually based on the weighted median of commercial payer reimbursement.

We cannot predict whether future health care initiatives will be implemented at the federal or state level, or how any future legislation or regulation may affect OncoCyte. The expansion of government's role in the U.S. health care industry as a result of the ACA, and changes to the reimbursement amounts paid by Medicare and other payers for diagnostic tests may have a materially adverse effect on OncoCyte's business, financial condition, results of operations and cash flows.

**Because of certain Medicare billing policies, OncoCyte may not receive complete reimbursement for tests provided to Medicare patients**

Medicare has coverage policies that can be national or regional in scope. Coverage means that the test or assay is approved as a benefit for Medicare beneficiaries. If there is no coverage, neither the supplier nor any other party, such as a diagnostic laboratory, may receive reimbursement from Medicare for the service. Regional policies are directed by Medicare's regional Medicare Administrative Contractors ("MACs"). Reimbursement for diagnostic testing may be negatively impacted by California MAC policies.

**Long payment cycles of Medicare, Medicaid and other third-party payors, or other payment delays, could hurt OncoCyte's cash flows and increase its need for working capital**

Medicare and Medicaid have complex billing and documentation requirements that OncoCyte will have to satisfy in order to receive payment. Failure to comply with these requirements and other laws applicable to billing may result in, among other things, non-payment, refunds, exclusion from government healthcare programs, and civil or criminal liabilities, any of which may have a material adverse effect on OncoCyte's revenues and earnings. Similarly, the failure of private health insurers or other private third-party payers to properly process OncoCyte's payment claims in a timely manner could delay its receipt of payment for its diagnostic tests and services, which may have a material adverse effect on its cash flows.

**Private health insurance company policies may deny coverage or limit the amount they will reimburse OncoCyte for the performance of its diagnostic tests**

Patients who are not covered by Medicare will generally rely on health insurance provided by private health insurance companies. If OncoCyte is considered a "non-contracted provider" by a third-party payer, that payer may not reimburse patients for diagnostic tests performed by OncoCyte or doctors within the payer's network of covered physicians may not use its services to perform diagnostic tests for their patients. As a result, OncoCyte may need to enter into contracts with health insurance companies or other private payers to provide diagnostic tests to their insured patients at specified rates of reimbursement which may be lower than the rates OncoCyte might otherwise collect.

**Risks Pertaining to Our Common Shares**

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

**Our net income or loss will be impacted by changes in the market value of Asterias and OncoCyte common stock**

Because we use the equity method of accounting for the common stock of Asterias and OncoCyte that we hold at fair value, we will recognize gain or loss to the extent that the market value of Asterias and OncoCyte common stock changes from calendar quarter to calendar quarter, regardless of whether we sell any of those shares.

**Because we are engaged in the development of pharmaceutical and stem cell therapy products and cancer diagnostic tests, the price of our common shares may rise and fall rapidly**

- The market price of our common shares, like that of the shares of many biotechnology companies, has been highly volatile.
- The price of our common shares may rise rapidly in response to certain events, such as the commencement of clinical trials of an experimental new therapy or diagnostic test, even though the outcome of those trials and the likelihood of ultimate FDA approval of a therapeutic product remain uncertain.
- Similarly, prices of our common shares may fall rapidly in response to certain events such as unfavorable results of clinical trials or a delay or failure to obtain FDA approval.
- The failure of our earnings to meet analysts' expectations could result in a significant rapid decline in the market price of our common shares.

**Current economic and stock market conditions may adversely affect the price of our common shares**

The stock market has 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 general economic and political conditions, may adversely affect the market price of our common shares.

**Because we do not pay dividends, our common shares may not be a suitable investment for anyone who needs to earn dividend income**

We do not pay cash dividends on our common shares. For the foreseeable future, we anticipate that any earnings generated in our business will be used to finance the growth of our business and will not be paid out as dividends to holders of our common shares. This means that our common shares may not be a suitable investment for anyone who needs to earn income from their investments.

**Securities analysts may not initiate coverage or continue to cover our common shares and this may have a negative impact on the market price of our common shares**

The trading market for our common shares will depend, in part, on the research and reports that securities analysts publish about our business and our common shares. We do not have any control over these analysts. There is no guarantee that securities analysts will cover our common shares. If securities analysts do not cover our common shares, the lack of research coverage may adversely affect the market price of those shares. If securities analysts do cover our common shares, they could issue reports or recommendations that are unfavorable to the price of our common shares, and they could downgrade a previously favorable report or recommendation, and in either case our share prices could decline as a result of the report. If one or more of these analysts does not initiate coverage, ceases to cover our common shares or fails to publish regular reports on our business, we could lose visibility in the financial markets, which could cause our share prices or trading volume to decline.

**Investors in our common shares may experience dilution of their ownership interests because of the future issuance of additional common shares and preferred shares by us and our subsidiaries**

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 152,000,000 shares of capital stock consisting of 150,000,000 common shares and 2,000,000 "blank check" preferred shares. As of December 31, 2016, there were 103,396,245 common shares outstanding of which 619,706 were held by our subsidiaries, 6,958,458 common shares reserved for issuance upon the exercise of outstanding options under our employee stock option plans; 100,000 common shares reserved for issuance upon the lapse of RSUs under our employee stock option plan; and 9,394,862 shares reserved for issuance upon the exercise of common share purchase warrants, including the publicly traded warrants.

The operation of some of our subsidiaries has been financed in part through the sale of capital stock in those subsidiaries to private investors. Sales of additional subsidiary shares could reduce our ownership interest in the subsidiaries, and correspondingly dilute our shareholder's ownership interests in our consolidated enterprise. Our subsidiaries also have their own stock option plans and the exercise of subsidiary stock options or the sale of restricted stock under those plans would also reduce our ownership interest in the subsidiaries, with a resulting dilutive effect on the ownership interest of our shareholders in our consolidated enterprise.

We and our subsidiaries may issue additional common shares or other securities that are convertible into or exercisable for common shares 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, or in connection with future business acquisitions, or for other business purposes. The future issuance of any such additional common shares or other securities may create downward pressure on the trading price of our common shares.

We may also issue preferred shares having rights, preferences, and privileges senior to the rights of our common shares with respect to dividends, rights to share in distributions of our assets if we liquidate our company, or voting rights. Any preferred shares may also be convertible into common shares on terms that would be dilutive to holders of common shares. Our subsidiaries may also issue their own preferred shares with a similar dilutive impact on our ownership of the subsidiaries.

**The market price of our common shares could be impacted by prices at which we sell shares in our subsidiaries**

The operation of some our subsidiaries has been financed in part through the sale of capital stock in those subsidiaries, and our subsidiaries may sell shares of their capital stock in the future for financing purposes. The prices at which our subsidiaries may sell shares of their capital stock could impact the value of our company as a whole and could impact the price at which our common shares trade in the market. A sale of capital stock of one of our subsidiaries at a price that the market perceives as low could adversely impact the market price of our common shares. Even if our subsidiaries sell their capital stock at prices that reflect arm's length negotiation with investors, there is no assurance that those prices will reflect a true fair market value or that the ascribed value of the subsidiaries based on those share prices will be fully reflected in the market value of our common shares.

**The implementation of a new FASB accounting standard could increase the risk that our future consolidated financial statements could be qualified by going concern uncertainty**

In August 2014, the FASB issued ASU No. 2014-15, "*Presentation of Financial Statements-Going Concern (Subtopic 205-40): Disclosure of Uncertainties about an Entity's Ability to Continue as a Going Concern.* " ASU No. 2014-15 defines management's responsibility to assess an entity's ability to continue as a going concern, and to provide related footnote disclosures. ASU No. 2014-15 is effective for us for the year ended December 31, 2016, and all annual and interim periods thereafter. In connection with preparing consolidated financial statements for each annual and interim reporting period, ASU No. 2014-15 requires that an entity's management evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the entity's ability to continue as a going concern within one year after the date that the consolidated financial statements are issued (or within one year after the date that the consolidated financial statements are available to be issued when applicable). As a result of the implementation of ASU No. 2014-15, we will be required to have more cash, cash equivalents, and liquid investments on hand on the date we issue or file our consolidated financial statements than had been the case during prior years in order to avoid a going concern qualification in our auditor's report and in the footnotes to our consolidated financial statements. If our consolidated financial statements were to become subject to a going concern qualification or uncertainty or if we are unable to alleviate substantial doubt as part of our going concern assessment, or both, the market price of our common stock could decline.

Asterias and OncoCyte will also be impacted by ASU No. 2014-15 in much the same manner as us. If the financial statements of Asterias, or OncoCyte, or both, were to become subject to a going concern qualification or uncertainty, the market price of their common stock could decline, resulting in a loss or decline in value of the Asterias shares we own, the OncoCyte shares we own, or both, as equity method investments at fair value.

**Item 1B. Unresolved Staff Comments**

None

**Item 2. Properties**

**BioTime Facilities**

Our principal offices and laboratory facilities comprise 30,795 square feet of rentable space in two buildings located in an office park setting at 1010 and 1020 Atlantic Avenue, in Alameda, California. OrthoCyte and OncoCyte share this space with us and it is where OncoCyte plans to establish its CLIA lab.

Base rent during the initial seven-year term of the Lease for the new office and research space will be as shown in the following table:

| Lease Year | Annual Base Rent | Monthly Installment of Base Rent |
|---|---|---|
| 1 | $776,034 | $64,669 |
| 2 | $798,206 | $66,517 |
| 3 | $824,074 | $68,672 |
| 4 | $846,246 | $70,520 |
| 5 | $872,114 | $72,676 |
| 6 | $897,982 | $74,831 |
| 7 | $927,545 | $77,295 |

In addition to base rent, we will pay a pro rata portion of increases in certain expenses, including real property taxes, utilities (to the extent not separately metered to our leased space) and the landlord's operating expenses, over the amounts of those expenses incurred by the landlord during 2016.

We also currently pay $5,050 per month for the use of approximately 900 square feet of office space in New York City, which is made available to us by one of our directors at his cost for use in conducting meetings and other business affairs.

From February 10, 2017 until May 31, 2017, we are subleasing a small portion of Asterias' facility in Fremont, California for $38,000 per month.

**Cell Cure Facilities**

Cell Cure has leased approximately 1,128 square meters of office and laboratory space in Jerusalem, Israel under a lease that expires between May 30, 2019 and December 31, 2020, with two additional options to extend the lease for 5 years each. Base monthly rent is approximately NIS 55,218 (approximately US $14,400 per month). In addition to base rent, Cell Cure pays a pro rata share of real property taxes and certain costs related to the operation and maintenance of the building in which the leased premises are located.

**Item 3. Legal Proceedings**

From time to time, we and our subsidiaries may be involved in routine litigation incidental to the conduct of our business. Cell Cure is presently a party to two pending opposition proceedings in the European Patent Office involving EP Patent Numbers 2147094 (issued 08-Oct-2014) and 2554661 (issued 19-Nov-2014), both entitled, "Stem Cell-Derived Retinal Pigment Epithelial Cells". The Oral Proceedings dates are March 16, 2017 and March 17, 2017, respectively. Both patents relate to our *OpRegen*® product and provide protection until April 2028. Cell Cure is vigorously defending these patents in the proceedings and does not believe the outcome will materially alter the protection or positioning of the *OpRegen*® product in the market. There are additional patent applications pending that if issued will provide further protection for *OpRegen*®.

**Item 4. Mine Safety Disclosures**

Not applicable

## PART II

### Item 5. Market for Registrant's Common Equity, Related Stockholder Matters, and Issuer Purchases of Equity Securities

Our common shares are traded on the NYSE MKT and on the TASE under the ticker symbol BTX. The following table sets forth the range of high and low closing prices for our common shares for the fiscal years ended December 31, 2015 and 2016, as reported by the NYSE MKT:

| Quarter Ended | High | Low |
|---|---|---|
| March 31, 2015 | $5.46 | $3.81 |
| June 30, 2015 | $5.88 | $3.51 |
| September 30, 2015 | $3.71 | $2.53 |
| December 31, 2015 | $4.38 | $3.19 |
| March 31, 2016 | $3.68 | $2.08 |
| June 30, 2016 | $3.25 | $2.29 |
| September 30, 2016 | $3.97 | $2.70 |
| December 31, 2016 | $3.89 | $2.89 |

As of February 28, 2017, there were 15,377 holders of the common shares based on the share position listing.

The following table shows certain information concerning the options outstanding and available for issuance under all of our compensation plans and agreements as of December 31, 2016 (in thousands, except weighted average exercise prices):

| Plan Category | Number of Shares to be Issued upon Exercise of Outstanding Options and Vesting of Restricted Stock Units, and Rights | Weighted Average Exercise Price of the Outstanding Options, and Rights | Number of Shares Remaining Available for Future Issuance under Equity Compensation Plans |
|---|---|---|---|
| BioTime Equity Compensation Plans Approved by Shareholders [(1)] | 7,058[(1)] | $3.60 | 2,894 |

(1) Includes 100,000 outstanding Restricted Stock Units, or RSUs.

The following table shows certain information concerning the options outstanding and available for issuance under all of the compensation plans and agreements for our consolidated subsidiary companies as of December 31, 2016 (in thousands, except weighted average exercise price per share):

| | Number of Shares to be Issued upon Exercise of Outstanding Options and Rights | Weighted Average Exercise Price of the Outstanding Options, and Rights | Number of Shares Remaining Available for Future Issuance under Equity Compensation Plans |
|---|---|---|---|
| OrthoCyte Equity Compensation Plans Approved by Shareholders [(1)] | 1,300 | $ 0.06 | 2,700 |
| OncoCyte Equity Compensation Plans Approved by Shareholders [(1)] | 3,017 | $ 2.52 | 880 |
| ReCyte Therapeutics Equity Compensation Plans Approved by Shareholders [(1)] | 1,250 | $ 2.05 | 2,750 |
| BioTime Asia Equity Compensation Plans Approved by Shareholders [(1)] | 300 | $ 0.01 | 1,300 |
| Cell Cure Compensation Plans Approved by Shareholders[(1)(2)] | 81 | $ 38.00 | 44 |
| LifeMap Sciences Equity Compensation Plans Approved by Shareholders [(1)] | 1,596 | $ 1.44 | 746 |
| LifeMap Solutions Compensation Plans Approved by Shareholders [(1)] | 12 | $500.00 | 7 |

(1) BioTime is, directly or through one or more subsidiaries, the majority shareholder. Except for OncoCyte, all other common stock underlying the stock options under the respective equity plans are privately-held.

(2) Cell Cure Share Option Plan US dollar exercise price is approximated based on the conversion rate between the US dollar and the New Israeli Shekel, NIS, at the time of grant. The exercise price is denominated in NIS and is 154 per share.

Additional information concerning our 2012 Equity Incentive Plan and the stock option plans of our subsidiaries may be found in Note 10 to the Consolidated Financial Statements.

**Dividend Policy**

We have never paid cash dividends on common shares and we do not anticipate paying cash dividends in the foreseeable future, but intend to retain our capital resources for reinvestment in our business. Any future determination to pay cash dividends on our common shares will be at the discretion of our Board of Directors and will be dependent upon our financial condition, results of operations, capital requirements and other factors as the Board of Directors deems relevant.

We have in the past distributed common stock of a subsidiary to our shareholders, on a pro rata basis, as a dividend in kind. We may distribute shares of subsidiaries or affiliated companies again in the future and any such distribution will be at the discretion of our Board of Directors and will be dependent upon our financial condition, results of operations, capital requirements and other factors as the Board of Directors deems relevant.

**Performance Measurement Comparison**[1]

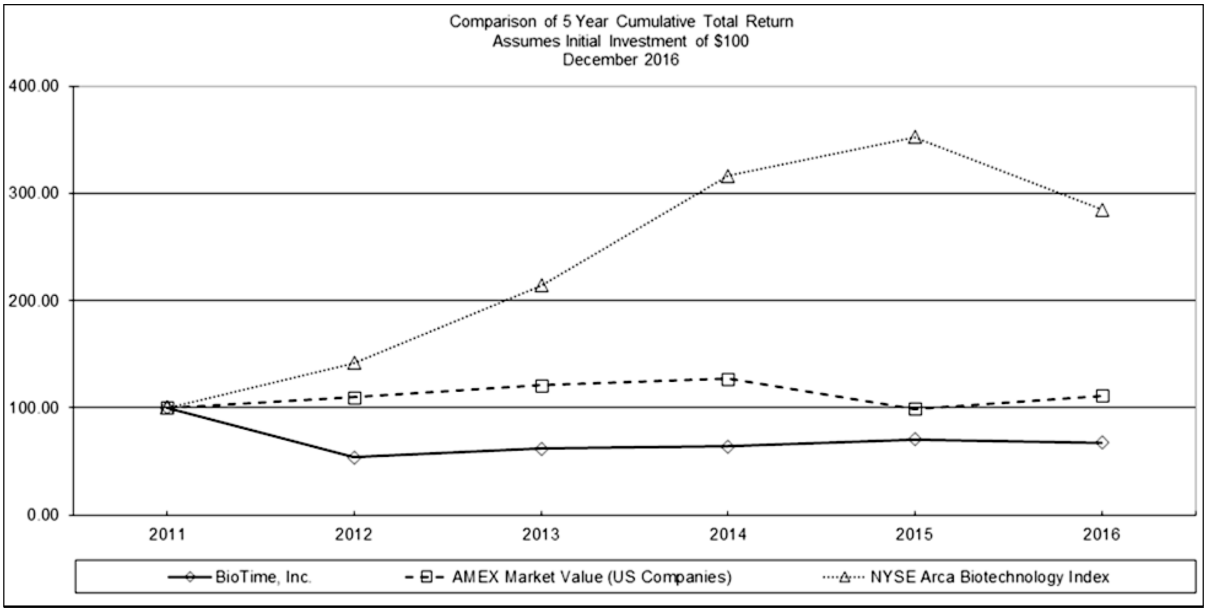
The following graph compares total stockholder returns of BioTime, Inc. for the last five fiscal years beginning December 31, 2011 to two indices: the NYSE Amex Market Value – U.S. Companies (Amex Market Value) and the NYSE Arca Biotechnology Index (NYSE Arca Biotechnology Index). The total return for our stock and for each index assumes the reinvestment of dividends, although we have never declared dividends on BioTime stock, and is based on the returns of the component companies weighted according to their capitalizations as of the end of each quarterly period. The NYSE Amex Market Value tracks the aggregate price performance of equity securities of U.S. companies listed therein. The NYSE Arca Biotechnology Index represents biotechnology companies, trading on NYSE MKT under the Standard Industrial Classification (SIC) Code Nos. 283 (Drugs) and 382 (Laboratory Apparatus and Analytical, Optical) main categories (2834:Pharmaceutical Preparations; 2835: Diagnostic Substances; 2836: Biological Products; 3826: Laboratory Analytical Instruments; and 3829: Measuring & Controlling Devices). BioTime common stock trades on the NYSE MKT and is a component of the NYSE Amex Market Value – US Companies.

**Comparison of Five-Year Cumulative Total Return on Investment**

| | | **2011** | **2012** | **2013** | **2014** | **2015** | **2016** |
|---|---|---|---|---|---|---|---|
| BioTime, Inc. | Return % | | -45.96 | 14.65 | 3.61 | 9.92 | -4.53 |
| | Cum $ | 100.00 | 54.04 | 61.96 | 64.20 | 70.57 | 67.37 |
| AMEX Market Value (US Companies) | Return % | | 9.84 | 10.23 | 5.09 | -22.23 | 12.45 |
| | Cum $ | 100.00 | 109.84 | 121.09 | 127.25 | 98.96 | 111.28 |
| NYSE Arca Biotechnology Index | Return % | | 41.88 | 50.80 | 47.91 | 11.39 | -19.15 |
| | Cum $ | 100.00 | 141.88 | 213.96 | 316.48 | 352.53 | 285.03 |

(1) This Section is not "soliciting material," is not deemed "filed" with the SEC and is not to be incorporated by reference in any filing of BioTime under the Securities Act of 1933, or the Securities Exchange Act of 1934, whether made before or after the date hereof and irrespective of any general incorporation language in any such filing. Shows the cumulative total return on investment assuming an investment of $100 in each of BioTime, Inc., the Amex Market Value and the NYSE Arca Biotechnology Index on December 31, 2011. The cumulative total return on BioTime common shares has been computed based on a price of $5.81per share, the price at which BioTime's common shares closed on December 31, 2011.

**BioTime, Inc., the Amex Market Value and NYSE Arca Biotechnology Index**



**Item 6. Selected Financial Data**

**BIOTIME, INC. AND SUBSIDIARIES**
**CONSOLIDATED STATEMENTS OF OPERATIONS**
**(IN THOUSANDS, EXCEPT PER SHARE DATA)**

| | Year Ended December 31, | | | | |
|---|---|---|---|---|---|
| **REVENUES:** | **2016** | **2015** | **2014** | **2013** | **2012** |
| Grant income | $ 3,671 | $ 4,502 | $ 3,297 | $ 1,573 | $ 2,222 |
| Royalties from product sales and license fees | 544 | 719 | 398 | 367 | 542 |
| Subscription and advertisement | 972 | 1,357 | 1,173 | 2,218 | 900 |
| Sales of research products and services | 736 | 458 | 376 | 276 | 251 |
| Total revenues | 5,923 | 7,036 | 5,244 | 4,434 | 3,915 |
| Cost of sales | (358) | (1,107) | (837) | (793) | (434) |
| Gross profit | 5,565 | 5,929 | 4,407 | 3,641 | 3,481 |
| **OPERATING EXPENSES:** | | | | | |
| Research and development | (36,106) | (42,604) | (37,533) | (26,609) | (18,117) |
| Acquired in-process research and development (1) | - | - | - | (17,459) | - |
| General and administrative | (28,426) | (29,134) | (17,556) | (15,559) | (10,365) |
| Total operating expenses | (64,532) | (71,738) | (55,089) | (59,627) | (28,482) |
| Loss from operations | (58,967) | (65,809) | (50,682) | (55,986) | (25,001) |
| **OTHER INCOME/(EXPENSE):** | | | | | |
| Interest income/(expense), net | (747) | (340) | (89) | - | 19 |
| BioTime's share of losses and impairment in equity method investment in Ascendance | (4,671) | (35) | - | - | - |
| Gain on deconsolidation of Asterias | 49,048 | - | | | |
| Gain on equity method investment in Asterias at fair value | 34,361 | - | - | - | - |
| Gain on investment | - | 3,694 | - | - | - |
| Other (expense)/income, net | (403) | (160) | (384) | (204) | (324) |
| Total other (expenses)/income, net | 77,588 | 3,159 | (473) | (204) | (305) |
| INCOME (LOSS) BEFORE INCOME TAX BENEFITS | 18,621 | (62,650) | (51,155) | (56,190) | (25,306) |
| Deferred income tax benefit | - | 4,516 | 7,376 | 3,281 | - |
| NET INCOME (LOSS) | 18,621 | (58,134) | (43,779) | (52,909) | (25,306) |
| Net loss attributable to noncontrolling interest | 14,951 | 11,143 | 7,367 | 9,026 | 3,880 |
| **NET INCOME (LOSS) ATTRIBUTABLE TO BIOTIME, INC** | 33,572 | (46,991) | (36,412) | (43,883) | (21,426) |
| Dividends on preferred shares | - | (415) | (87) | - | - |
| **NET INCOME (LOSS) ATTRIBUTABLE TO BIOTIME, INC. COMMON SHAREHOLDERS** | $ 33,572 | $ (47,406) | $ (36,499) | $ (43,883) | $ (21,426) |
| NET INCOME (LOSS) PER COMMON SHARE | | | | | |
| BASIC | $ 0.35 | $ (0.59) | $ (0.55) | $ (0.81) | $ (0.44) |
| DILUTED | $ 0.34 | $ (0.59) | $ (0.55) | $ (0.81) | $ (0.44) |
| WEIGHTED AVERAGE NUMBER OF SHARES OF COMMON STOCK OUTSTANDING: | | | | | |
| BASIC | 97,316 | 79,711 | 66,467 | 54,226 | 49,214 |
| DILUTED | 99,553 | 79,711 | 66,467 | 54,226 | 49,214 |

| | December 31, | | | | |
|---|---|---|---|---|---|
| | 2016(2) | 2015 | 2014 | 2013 | 2012 |
| **Consolidated Balance Sheet Data (in thousands):** | | | | | |
| Cash and cash equivalents | $ 22,088 | $ 42,229 | $ 29,487 | $ 5,495 | $ 4,350 |
| Total assets | 142,572 | 94,660 | 74,901 | 57,730 | 29,749 |
| Total liabilities | 12,064 | 18,213 | 12,178 | 15,467 | 5,454 |
| Accumulated deficit | (196,321) | (229,893) | (182,190) | (145,778) | (101,896) |
| Total shareholder's equity | $ 130,508 | $ 76,447 | $ 62,723 | $ 42,262 | $ 24,294 |

(1) Represents the value of incomplete research and development projects acquired by Asterias from Geron Corporation under an Asset Contribution Agreement.

(2) Reflects the effect of the Asterias Deconsolidation that occurred on May 13, 2016. See Note 3 to our consolidated financial statements included elsewhere in this Report.

## Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

*The following Management's Discussion and Analysis of Financial Condition and Results of Operations is intended to provide information necessary to understand our audited consolidated financial statements for the three-year period ended December 31, 2016, and highlight certain other information which, in the opinion of management, will enhance a reader's understanding of our financial condition, changes in financial condition and results of operations. In particular, the discussion is intended to provide an analysis of significant trends and material changes in our financial position and the operating results of our business during the year ended December 31, 2016 as compared to the year ended December 31, 2015, and during the year ended December 31, 2015 as compared to the year ended December 31, 2014. This discussion should be read in conjunction with our consolidated financial statements for the three-year period ended December 31, 2016 and related notes included elsewhere in this Annual Report on Form 10-K. These historical financial statements may not be indicative of our future performance. This Management's Discussion and Analysis of Financial Condition and Results of Operations contains a number of forward-looking statements, all of which are based on our current expectations and could be affected by the uncertainties and risks described throughout this Report, particularly in "Item 1A. Risk Factors."*

### Critical Accounting Policies

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States ("GAAP") requires management to make estimates and assumptions that affect the reported amounts in our consolidated financial statements and related notes. Our significant accounting policies are described in Note 2 to our consolidated financial statements included elsewhere in this Report. We have identified below our critical accounting policies and estimates that we believe require the greatest amount of judgment. On an ongoing basis, we evaluate estimates which are subject to significant judgment, including those related to going concern assessment of our consolidated financial statements, useful lives associated with long-lived assets, including evaluation of asset impairment, allowances for uncollectible accounts receivables, valuing shares owned in nonconsolidated companies using the equity method of accounting, loss contingencies, deferred income taxes and tax reserves, including valuation allowances related to deferred income taxes, and assumptions used to value stock-based awards, debt or other equity instruments. Actual results could differ materially from those estimates. On an ongoing basis, we evaluate our estimates compared to historical experience and trends which form the basis for making judgments about the carrying value of assets and liabilities. To the extent that there are material differences between our estimates and our actual results, our future financial statement presentation, financial condition, results of operations and cash flows will be affected.

We believe the assumptions and estimates associated with the following have the greatest potential impact on our consolidated financial statements.

*Going concern assessment* – With the implementation of FASB's new standard on going concern, ASU No. 2014-15, beginning with the year ended December 31, 2016 and all annual and interim periods thereafter, we will assess going concern uncertainty in our consolidated financial statements to determine if we have sufficient cash and cash equivalents on hand and working capital to operate for a period of at least one year from the date our consolidated financial statements are issued or are available to be issued, which is referred to as the "look-forward period" as defined by ASU No. 2014-15. As part of this assessment, based on conditions that are known and reasonably knowable to us, we will consider various scenarios, forecasts, projections, and estimates, and we will make certain key assumptions, including the timing and nature of projected cash expenditures or programs, and our ability to delay or curtail those expenditures or programs, if necessary, among other factors. Based on this assessment, as necessary or applicable, we make certain assumptions concerning our ability to curtail or delay research and development programs and expenditures to the extent we deem probable those implementations can be achieved and we have the proper authority to execute them within the look-forward period in accordance with ASU No. 2014-15.

*Revenue recognition* – We comply with ASC 605-10 and recognize revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable, and collectability is reasonably assured. Grant income is recognized as revenue when the related research and development expenses are incurred. Revenues from the sale of research products and services are primarily derived from the sale of hydrogels and stem cell products and are recognized when earned. Royalty revenues consist of product royalty payments. We recognize revenue in the quarter in which the royalty reports are received rather than the quarter in which the sales took place. License fee revenues consist of fees under license agreements and are recognized when earned and reasonably estimable and, also include subscription and advertising revenue from our online databases based upon applicable subscription or advertising periods. When we are entitled to receive up-front nonrefundable licensing or similar fees pursuant to agreements under which we have no continuing performance obligations, the fees are recognized as revenues when collection is reasonably assured. When we receive up-front nonrefundable licensing or similar fees pursuant to agreements under which we do have continuing performance obligations, the fees are deferred and amortized ratably over the performance period. If the performance period cannot be reasonably estimated, we amortize nonrefundable fees over the life of the contract until such time that the performance period can be more reasonably estimated. Milestone payments, if any, related to scientific or technical achievements, subject to substantial uncertainty, are recognized in income when the milestone is accomplished if (a) substantive effort was required to achieve the milestone, (b) the amount of the milestone payment appears reasonably commensurate with the effort expended, and (c) collection of the payment is reasonably assured.

*Equity method accounting for Asterias, at fair value* – We use the equity method of accounting when we have the ability to exercise significant influence, but not control, as determined in accordance with GAAP, over the operating and financial policies of a company in which we hold an equity interest. For equity method investments, which we have elected to measure at fair value, unrealized gains and losses are reported in the consolidated statements of operations as a non-operating gain or loss from equity method investments. See Note 4 to our consolidated financial statements included elsewhere in this Report.

*Investments in Common Stock of Privately Held Companies* – We evaluate whether our ownership of common stock of a company requires consolidation of the company under, first, the variable interest entity ("VIE") model, and then under the Voting Interest model, in accordance with accounting guidance for consolidations under Accounting Standards Codification ("ASC") 810-10. If consolidation of the company is not required under either the VIE model or the Voting Interest model, we determine whether the equity method of accounting should be applied in accordance with ASC 323, *Investments – Equity Method and Joint Ventures*. The equity method of accounting applies to investments in common stock or in-substance common stock of a company if we exercise significant influence over, but does not control, the company, which typically occurs if we own 20% or more, but less than a majority, of the voting interests of a company.

We initially record equity method interests at fair value on the date of the acquisition with subsequent adjustments to the investment balance based on our share of earnings or losses from the investment included in other income or expenses, net, on our consolidated statements of operations. The equity method investment balance is shown in noncurrent assets on our consolidated balance sheets.

We review investments accounted for under the equity method for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be fully recoverable. If a determination is made that an "other-than-temporary" impairment exists, we write down the investment to fair value. Based on our evaluation and continuing losses and negative cash flows generated from our interest in Ascendance, including uncertainty as to Ascendance's ability to raise sufficient financing, we determined that an other-than-temporary impairment existed with respect to the Ascendance common stock we owned as of December 31, 2016, and we wrote down the entire carrying value of that investment as of that date. See Note 2 to our consolidated financial statements included elsewhere in this Report.

*Long-lived intangible assets* – Long-lived intangible assets, consisting primarily of acquired patents, patent applications, and licenses to use certain patents are stated at acquired cost, less accumulated amortization. Amortization expense is computed using the straight-line method over the estimated useful lives of the assets, generally over 10 years.

*Impairment of long-lived assets* – Our long-lived assets, including long-lived intangible assets, are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be fully recoverable. If an impairment indicator is present, we evaluate recoverability by a comparison of the carrying amount of the assets to future undiscounted net cash flows expected to be generated by the assets. If the assets are impaired, the impairment recognized is measured by the amount by which the carrying amount exceeds the estimated fair value of the assets.

*Research and development* – Research and development expenses consist of costs incurred for company-sponsored, collaborative and contracted research and development activities. These costs include direct and research-related overhead expenses including salaries, payroll taxes, consulting fees, research and laboratory fees, rent of research facilities, amortization of intangible assets, costs of patent applications, prosecution and maintenance, and license fees paid to third parties to acquire patents or licenses to use patents and other technology. We expense research and development costs as incurred. Research and development expenses incurred and reimbursed by grants from third parties approximate the grant income recognized in the consolidated statements of operations.

*Stock-based compensation* – We follow accounting standards governing share-based payments, which require the measurement and recognition of compensation expense for all share-based compensation awards made to directors and employees, including employee stock options, based on estimated fair values, less estimated forfeitures. We utilize the Black-Scholes-Merton option pricing model. Our determination of fair value of share-based payment awards on the date of grant using an option-pricing model is affected by our stock price as well as assumptions regarding a number of complex and subjective variables. These variables include, but are not limited to, expected stock price volatility over the term of the awards, and the expected term of options granted, derived from actual and projected employee stock option exercise behaviors. The expected term of options granted is derived from historical data on employee exercises and post-vesting employment termination behavior. The risk-free rate is based on the U.S. Treasury rates in effect during the corresponding period of grant.

As disclosed in Note 10 to our consolidated financial statements, certain of our privately-held consolidated subsidiaries have their own share-based compensation plans. For share-based compensation awards granted by our privately-held consolidated subsidiaries under their respective equity plans, we determine the expected stock price volatility using historical prices of comparable public company's common stock for a period equal to the expected term of the options. The expected term of those privately-held company options is based upon the "simplified method" provided under *Staff Accounting Bulletin, Topic 14*, or SAB Topic 14. The fair value of the shares of common stock underlying the stock options of these privately-held consolidated subsidiaries is determined by the Board of Directors of those subsidiaries, as applicable, which is also used to determine the exercise prices of those stock options at the time of grant.

Although the fair value of employee stock options is determined in accordance with FASB guidance, changes in the assumptions can materially affect the estimated value and therefore the amount of compensation expense recognized in the consolidated financial statements.

In management's opinion, the existing valuation models may not provide an accurate measure of the fair value of employee stock options because the option-pricing model value may not be indicative of the fair value that would be established in a willing buyer/willing seller market transaction.

*Treasury stock* – We account for BioTime common shares issued to subsidiaries for future potential working capital needs as treasury stock on the consolidated balance sheet. We have registered the BioTime common shares held by our subsidiaries for sale under the Securities Act of 1933, as amended (the "Securities Act") to enhance the marketability of the shares. See Note 9 to the consolidated financial statements.

*Accounting for warrants* – We determine the accounting classification of warrants that we or our subsidiaries issue, as either liability or equity classified, by assessing whether the warrants meet liability classification, first, in accordance with ASC 480-10, *Accounting for Certain Financial Instruments with Characteristics of both Liabilities and Equity*, and then in accordance with ASC 815-40, *Accounting for Derivative Financial Instruments Indexed to, and Potentially Settled in, a Company's Own Stock*. Under ASC 480, warrants are classified as a liability if the warrants are mandatorily redeemable, obligate us to settle the warrants or the underlying shares by paying cash or other assets, or the warrants must or may require settlement by issuing a variable number of shares. If warrants do not meet liability classification under ASC 480-10, we assess the requirements under ASC 815-40, which states that contracts that require or may require the issuer to settle the contract for cash are liabilities recorded at fair value, irrespective of the likelihood of the transaction occurring that triggers the net cash settlement feature. If the warrants do not require liability classification under ASC 815-40, in order to conclude equity classification, we also assess whether the warrants are indexed to our or our subsidiary's common stock, as applicable, and whether the warrants are classified as equity under ASC 815-40 or other applicable GAAP. After all relevant assessments are made, we conclude whether the warrants are classified as liability or equity. Liability classified warrants are required to be accounted for at fair value both on the date of issuance and on subsequent accounting period ending dates, with all changes in fair value after the issuance date recorded in the consolidated statements of operations as a gain or loss. Equity classified warrants are accounted for at fair value on the date of issuance with no changes in value recognized subsequent to the issuance date. We do not have any liability classified warrants as of any period presented. See Note 9 to the consolidated financial statements.

*Income taxes* – We account for income taxes in accordance with ASC 740, *Income Taxes*, which prescribe the use of the asset and liability method, whereby deferred tax asset or liability account balances are calculated at the balance sheet date using current tax laws and rates in effect. Valuation allowances are established when necessary to reduce deferred tax assets when it is more likely than not that a portion or all of the deferred tax assets will not be realized. ASC 740 guidance also prescribes a recognition threshold and a measurement attribute for the financial statement recognition and measurement of tax positions taken or expected to be taken in a tax return. For benefits to be recognized, a tax position must be more-likely-than-not sustainable upon examination by taxing authorities. We file a U.S. federal income tax return as well as various state and foreign income tax returns. Our judgments regarding future taxable income may change over time due to changes in market conditions, changes in tax laws, tax planning strategies or other factors. Certain majority-owned subsidiaries that we consolidate under GAAP file their own, standalone federal income tax returns as those subsidiaries are not considered consolidated under federal income tax regulations, and accordingly, we may not use the tax attributes of those subsidiaries for our income taxes. If our assumptions, and consequently our estimates, change in the future with respect to our own deferred tax assets and liabilities, the valuation allowance may be increased or decreased, which may have a material impact on our consolidated statements of operations.

As further discussed in Note 12 to our consolidated financial statements, we adopted early the provisions of Accounting Standards Update, ASU 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, on a retrospective basis and due to the full valuation allowance on our deferred tax assets for all periods presented. The adoption did not have any impact on the consolidated financial statements.

*Principles of consolidation* – Our consolidated financial statements include the accounts of our subsidiaries ESI, ReCyte Therapeutics, OncoCyte, OrthoCyte, BioTime Asia, Cell Cure Neurosciences, and LifeMap Sciences. All material intercompany accounts and transactions have been eliminated in consolidation. The consolidated financial statements are presented in accordance with accounting principles generally accepted in the U.S. and with the accounting and reporting requirements of SEC Regulation S-X.

As further discussed in Notes 3 and 4 to our consolidated financial statements, effective May 13, 2016, we deconsolidated Asterias financial statements and results of operations due to the decrease in our percentage ownership in Asterias from 57.1% to 48.7% as a result of Asterias' public offering of its common stock to raise capital for its operations (the "Asterias Deconsolidation"). On May 13, 2016, we experienced a loss of control of Asterias under GAAP. Loss of control is deemed to have occurred when, among other things, a parent company owns less than a majority of the outstanding common stock in the subsidiary, lacks a controlling financial interest in the subsidiary and, is unable to unilaterally control the subsidiary through other means such as having, or being able to obtain, the power to elect a majority of the subsidiary's Board of Directors based solely on contractual rights or ownership of shares holding a majority of the voting power of the subsidiary's voting securities. All of these loss-of-control factors were present for with respect to our interest in Asterias as of May 13, 2016. Accordingly, since May 13, 2016, we have accounted for Asterias using the equity method of accounting at fair value. Our consolidated financial statements present the operating results of all of our wholly-owned and majority-owned subsidiaries that we consolidate as required under GAAP. Although beginning on May 13, 2016, Asterias' financial statements and results will no longer be part of our consolidated financial statements and results, the market value of the Asterias common stock we hold will be reflected on our consolidated balance sheet and changes in the market value of those shares will be reflected in our consolidated statements of operations, allowing our shareholders to evaluate the value of the Asterias portion of our business.

As further discussed in Note 16 to the consolidated financial statements, on February 17, 2017, we deconsolidated OncoCyte's financial statements from our consolidated financial statements due to our "loss of control" of OncoCyte under GAAP as a result of the decrease in our percentage ownership in OncoCyte from 51.1% to 49.9% following the exercise of OncoCyte stock purchase warrants by certain investors (the "OncoCyte Deconsolidation). Beginning on February 17, 2017, we will account for the OncoCyte common stock we hold using the equity method of accounting at fair value. Although beginning on February 17, 2017, OncoCyte's financial statements and results will no longer be part of our consolidated financial statements and results, the market value of the OncoCyte common stock we hold will be reflected on our consolidated balance sheet and changes in the market value of those shares will be reflected in our consolidated statements of operations, allowing our shareholders to evaluate the value of the OncoCyte portion of our business. The financial statement effect of the OncoCyte Deconsolidation will be reported for the quarter ending March 31, 2017, and is expected to result in an unrealized gain on deconsolidation in our consolidated statements of operations.

**Results of Operations**

***Comparison of Years Ended December 31, 2016 and 2015***

To provide proper comparability of the results of BioTime due to the Asterias Deconsolidation, the following tables provide consolidated results of operations of BioTime for the years ended December 31, 2016 and 2015, then show the results operations of Asterias that are included in BioTime's consolidated results, which include the periods from January 1, 2016 through May 12, 2016 (133 days) and, for the year ended December 31, 2015, after intercompany eliminations, to arrive at the BioTime consolidated results less Asterias (in thousands).

| | Year Ended December 31, 2016 | | | Year Ended December 31, 2015 | | |
|---|---|---|---|---|---|---|
| | Consolidated Results of Operations | Asterias (133 days) | Consolidated Results less Asterias | Consolidated Results of Operations | Asterias | Consolidated Results less Asterias |
| **REVENUES:** | | | | | | |
| Grant income | $ 3,671 | $ 2,247 | $ 1,424 | $ 4,502 | $ 3,007 | $ 1,495 |
| Royalties from product sales and license fees | 544 | 107 | 437 | 719 | 535 | 184 |
| Subscription and advertising | 972 | - | 972 | 1,357 | - | 1,357 |
| Sale of research products and services | 736 | - | 736 | 458 | 40 | 418 |
| Total revenues | 5,923 | 2,354 | 3,569 | 7,036 | 3,582 | 3,454 |
| Cost of sales | (358) | (53) | (305) | (1,107) | (268) | (839) |
| Gross profit | $ 5,565 | $ 2,301 | $ 3,264 | $ 5,929 | $ 3,314 | $ 2,615 |

***Revenues***

The following tables show our consolidated revenues for the years ended December 31, 2016 and 2015 (amounts in thousands).

| | Year Ended December 31, 2016 | Year Ended December 31, 2015 | $ Increase/ Decrease | % Increase/ Decrease |
|---|---|---|---|---|
| Grant income | $3,671 | $4,502 | $ -831 | -18% |
| Royalty from product sales and license fees | 544 | 719 | -175 | -24% |
| Subscription and advertising | 972 | 1,357 | -385 | -28% |
| Sales of research products and services | 736 | 458 | +278 | +61% |
| Total revenues | 5,923 | 7,036 | -1,113 | -16% |
| Cost of sales | (358) | (1,107) | -749 | -68% |
| Gross profit | $5,565 | $5,929 | $ -364 | -6% |

For the year ended December 31, 2016, total consolidated revenues decreased by $1.1 million as compared to the same period in 2015 primarily due to the Asterias Deconsolidation which resulted in the exclusion of Asterias revenue from our financial results after May 12, 2016. Revenues, net of Asterias, were relatively unchanged in 2016 compared to 2015 at $3.6 million and $3.5 million, respectively BioTime grant income, net of Asterias, for 2016, was entirely from grants awarded to Cell Cure by the Israel Innovation Authority, or IIA (formerly the Office of the Chief Scientist of Israel) of the Ministry of Economy and Industry, for the development of *OpRegen*® while in 2015, grant income, net of Asterias, was from the IIA of $1.0 million to Cell Cure and $0.5 million from the National Institutes of Health.

Our subscription and advertising revenues amounted to $1.0 million and $1.4 million for the years ended December 31, 2016 and 2015, respectively. Subscription and advertising revenues entirely represent subscription and advertising revenues from LifeMap Science's online database business primarily related to its *GeneCards*® database.

Revenues from the sale of research products and services in 2015 were primarily derived from the sale of hydrogels and stem cell products by our former ESI-BIO division. During December 2015, we contributed or licensed rights to sell those research products to Ascendance in exchange for shares of Ascendance common stock, and as a result, revenues from sales of those products decreased by $0.4 million in 2016. Service revenues of $0.7 million in 2016 were primarily generated by LifeMap Solutions from mobile health software development performed for its customers.

Cost of sales for the year ended December 31, 2016 as compared to 2015 decreased in line with the decrease in the various streams of revenues other than grant income, also contributed by the deconsolidation of Asterias related cost of sales.

***Operating Expenses***

The following table shows our consolidated operating expenses for the years ended December 31, 2016 and 2015 (in thousands).

| | Years Ended December 31, 2016 | Years Ended December 31, 2015 | $ Increase/ Decrease | % Increase/ Decrease |
|---|---|---|---|---|
| Research and development expenses | $36,106 | $42,604 | $-6,498 | - 15% |
| General and administrative expenses | 28,426 | 29,134 | -708 | -2% |

| | Year Ended December 31, 2016 | | | Year Ended December 31, 2015 | | |
|---|---|---|---|---|---|---|
| | Consolidated Results of Operations | Asterias (133 days) | Consolidated Results less Asterias | Consolidated Results of Operations | Asterias | Consolidated Results less Asterias |
| **OPERATING EXPENSES:** | | | | | | |
| Research and development | $36,106 | $8,684 | $27,422 | $42,604 | $17,322 | $25,282 |
| General and administrative | 28,426 | 7,561 | 20,865 | 29,134 | 7,711 | 21,423 |

*Research and development expenses*

Total research and development expenses decreased by $6.5 million to $36.1 million in 2016 from $42.6 million in 2015. The decrease is attributable primarily to the Asterias Deconsolidation which resulted in the exclusion of Asterias expenses after May 12, 2016. Research and development expenses attributable to BioTime, net of Asterias, increased approximately $2.1 million or 8% to $27.4 million for the year ended December 31, 2016, from $25.3 million during 2015. The increase is primarily attributable to the development of *PureStem*® progenitor and pluripotent cell lines and related research products by BioTime, the development of *OpRegen*® by Cell Cure, and the development of cancer diagnostic tests by OncoCyte. These expenses include consulting and outside research and services, including stock-based compensation to consultants, and regulatory and clinical trials of BioTime's *Renevia*®, Cell Cure *OpRegen*®, and OncoCyte's cancer diagnostic tests.

The following table shows the approximate amounts and percentages of our total research and development expenses of $36.1 million and $42.6 million allocated to our primary research and development programs during the years ended December 31, 2016 and 2015, respectively (amounts in thousands).

| | | Amount[(1)] | | Percent | |
|---|---|---|---|---|---|
| **Company** | **Program** | **2016** | **2015** | **2016** | **2015** |
| BioTime and ESI | *PureStem*® progenitor and pluripotent cell lines, and related research products | $ 6,060 | $ 5,196 | 16.8% | 12.2% |
| BioTime | *Renevia*® and other *HyStem*® products and research | 3,856 | 4,047 | 10.7% | 9.5% |
| BioTime | *Hextend*® | 54 | 59 | 0.1% | 0.1% |
| Cell Cure[(2)] | *OpRegen*® | 4,803 | 4,086 | 13.3% | 9.6% |
| OrthoCyte | Orthopedic therapy | 606 | 590 | 1.7% | 1.4% |
| ReCyte Therapeutics | Cardiovascular therapy | 949 | 1,142 | 2.6% | 2.7% |
| Subtotal therapeutic projects | | 16,328 | 15,120 | 45.2% | 35.5% |
| Asterias[(3)] | Pluripotent cell therapy programs | 8,684 | 17,322 | 24.1% | 40.7% |
| LifeMap Sciences[(4)] | Databases and mobile health products | 5,348 | 5,251 | 14.8% | 12.3% |
| OncoCyte | Cancer diagnostics | 5,746 | 4,911 | 15.9% | 11.5% |
| Subtotal non-therapeutic projects | | 11,094 | 10,162 | 30.7% | 23.8% |
| Total projects | | $36,106 | $42,604 | 100.0% | 100.0% |

(1) Amount includes research and development expenses incurred directly by the named subsidiary and certain general research and development expenses, such as lab supplies, lab expenses, rent, and insurance allocated to research and development expenses, incurred directly by BioTime on behalf of the subsidiary and allocated to the subsidiary.

(2) Cell Cure expenses, although shown at 100% in the table, are funded 75% by BioTime and 25% by non-controlling interests in Cell Cure.

(3) Amounts for 2016 include only the period from January 1 through May 12, 2016, due to the deconsolidation of Asterias.

(4) Includes LifeMap Solutions, Inc., a wholly-owned subsidiary of LifeMap Sciences.

*General and administrative expenses*

The following table shows the amount and approximate percentages of our total general and administrative expenses of $28.4 million and $29.1 million allocated to BioTime and our subsidiaries during the years ended December 31, 2016 and 2015, respectively (amounts in thousands).

| | Amount(1) | | Percent | |
|---|---|---|---|---|
| **Company** | **2016** | **2015** | **2016** | **2015** |
| BioTime | $ 8,958 | $ 9,761 | 31.5% | 33.5% |
| Cell Cure(4) | 1,185 | 655 | 4.2% | 2.2% |
| OrthoCyte | 570 | 582 | 2.0% | 2.0% |
| ReCyte Therapeutics | 581 | 760 | 2.0% | 2.6% |
| ESI | 276 | 245 | 1.0% | 0.9% |
| Subtotal therapeutic entities | 11,570 | 12,003 | 40.7% | 41.2% |
| Asterias(2) | 7,561 | 7,711 | 26.6% | 26.5% |
| LifeMap Sciences(3) | 3,385 | 5,142 | 11.9% | 17.6% |
| OncoCyte | 5,910 | 4,278 | 20.8% | 14.7% |
| Subtotal non-therapeutic entities | 9,295 | 9,420 | 32.7% | 32.3% |
| Total | $ 28,426 | $ 29,134 | 100.0% | 100.0% |

(1) Amount includes general and administrative expenses incurred directly by the named subsidiary and allocations from BioTime for certain general overhead expenses to the subsidiary.

(2) Amounts for 2016 include only the period from January 1 through May 12, 2016, due to the deconsolidation of Asterias.

(3) Includes LifeMap Solutions, Inc., a wholly-owned subsidiary of LifeMap Sciences.

(4) Cell Cure expenses, although shown 100% in the table above, are funded 75% by BioTime and 25% by noncontrolling interests in Cell Cure.

General and administrative expense for the years ended December 31, 2016 and 2015 decreased by $0.7 million. The decrease is mainly attributable to a $2.1 million decrease in stock-based compensation expense due primarily to modification adjustments made in 2015 and lower exercise prices for grants made in 2016. This decrease is offset by an increase in bad debt expense of $0.9 million to account for bad debts on subscription receivables for LifeMap Sciences and shared services receivable from Ascendance. In addition, there was an increase of $0.5 million for payroll and related expenses due to an increase in headcount.

LifeMap Sciences expenses decreased $1.8 million due to reductions of headcount.

OncoCyte expenses increased by $1.6 million due to increased headcount and increased public company compliance and reporting costs.

General and administrative expenses include employee and director compensation allocated to general and administrative expenses, consulting fees other than those paid for science-related consulting, facilities and equipment rent and maintenance related expenses, insurance costs allocated to general and administrative expenses, stock exchange-related costs, depreciation expense, shipping expenses, marketing costs, legal and accounting costs, and other miscellaneous expenses which are allocated to general and administrative expense.

For the period January 1, 2017 through February 16, 2017, OncoCyte's operating expenses and results will be included in our consolidated operating expenses and results. Beginning on February 17, 2017, with the OncoCyte Deconsolidation, we will no longer include OncoCyte's operating expenses and results with our consolidated operating expenses and results. However, beginning on February 17, 2017, the market value of OncoCyte common stock held by BioTime will be reflected on BioTime's consolidated balance sheet and changes in the market value of those shares will be reflected in BioTime's consolidated statements of operations, included in other income and expenses, net. See Note 16 to our consolidated financial statements.

***Other income and expenses, net***

*Unrealized gain on deconsolidation of Asterias* – During the year ended December 31, 2016, we recorded an unrealized gain of $49.0 million in connection with the Asterias Deconsolidation.

We expect to recognize an unrealized gain on the OncoCyte Deconsolidation which occurred on February 17, 2017, in our consolidated statements of operations for the quarter ending March 31, 2017.

*Unrealized gain on Asterias shares* – We own 21.7 million shares of common stock of Asterias, or approximately 46% of Asterias outstanding common stock as of December 31, 2016. We elected to account for our shares in Asterias at fair value using the equity method of accounting beginning on May 13, 2016, the date of the Asterias Deconsolidation. Our Asterias shares had a fair value of $100.0 million as of December 31, 2016 and a fair value of $65.7 million as of May 13, 2016, based on the closing price of Asterias common stock on the NYSE MKT on those respective dates, resulting in unrealized gain of $34.3 million recorded in 2016.

*Interest income/(expense)* – During 2016, we incurred $1.1 million in interest expense which includes $0.3 million in amortized interest expenses from our leasehold improvements and lease liability, offset by $0.3 million of interest income. During 2015, we incurred $0.5 million in interest expense offset by $0.1 million in interest income. Interest income is primarily attributed to interest earned on money market funds during their respective years.

*Gain on certain assets* – During 2015, a $3.7 million unrealized gain was generated on the sale of a certain group of assets as part of our acquisition of shares of common stock of Ascendance in December 2015.

*BioTime's share of losses and impairment in equity method investment in Ascendance* – During 2016, we recognized $4.7 million as our share of Ascendance's net loss and from an impairment charge of the remaining carrying value in our Ascendance investment based on a determination that an impairment in the value of the shares had occurred. During 2015, we recognized $35,000 for our share of Ascendance's net loss.

*Other income/(expense)* – Other income and expenses, net, in 2016 and 2015 consists primarily of net foreign currency transaction gains and losses recognized by ESI and by Cell Cure.

***Comparison of Years Ended December 31, 2015 and 2014***

***Revenues***

The following tables show our revenues for the years ended December 31, 2015 and 2014 (amounts in thousands).

| | Year Ended December 31, | | $ Increase/ | % Increase/ |
|---|---|---|---|---|
| | 2015 | 2014 | Decrease | Decrease |
| Subscription and advertising | $1,357 | $1,173 | $ +184 | +16% |
| Royalty from product sales | 719 | 398 | +321 | +81% |
| Grant income | 4,502 | 3,297 | +1,205 | +37% |
| Sales of research products and services | 458 | 376 | +82 | +22% |
| Total revenues | 7,036 | 5,244 | +1,792 | +34% |
| Cost of sales | (1,107) | (837) | +270 | +32% |
| Gross profit | $5,929 | $4,407 | $+1,522 | +35% |

Our subscription and advertising revenues amounted to $1.4 million and $1.2 million for the years ended December 31, 2015 and 2014, respectively. License fee revenue entirely represents subscription and advertising revenues from LifeMap Science's online database business primarily related to its *GeneCards*® database.

Our royalty revenues from product sales for the years ended December 31, 2015 and 2014 include $719,000 and $398,000 respectively, of royalties on sales of products, including $535,000 of royalties paid to Asterias primarily by GE Healthcare and Stem Cell Technologies, Inc. and $184,000 of royalties paid to BioTime by Hospira, CJ Health and Millipore in 2015. Royalties from Hospira from the sale of *Hextend*® are due ninety (90) days after the end of each calendar quarter and are recognized as revenue during the quarter in which we receive payment or a royalty report from Hospira.

Total grant revenue in 2015 increased by approximately 37% primarily due to recognition of $3.0 million of the $14.3 million CIRM grant awarded to Asterias in 2014. Grant revenue for the years ended December 31, 2015 and 2014 also include $456,000 and $656,000, respectively, from various grants awarded to us by the National Institutes of Health (''NIH'') and $1.0 million and $1.6 million, respectively, of grants from the IIA recognized through Cell Cure. All of the NIH grants expired as of December 31, 2015.

Revenues from the sale of research products and services are primarily derived from the sale of hydrogels and stem cell products by our ESI-BIO division. During December 2015, we contributed or licensed rights to sell those research products in exchange for our equity method investment in Ascendance.

***Expenses***

The following tables show our operating expenses for the years ended December 31, 2015 and 2014 (amounts in thousands).

| | Year Ended December 31, 2015 | Year Ended December 31, 2014 | $ Increase/ Decrease | % Increase/ Decrease |
|---|---|---|---|---|
| Research and development expenses | $(42,604) | $(37,533) | $+5,071 | +14% |
| General and administrative expenses | (29,134) | (17,556) | +11,578 | +66% |
| Interest expense, net | (340) | (89) | +251 | +282% |
| Gain on equity method investment | 3,694 | - | +3,694 | -% |
| BioTime's share of losses in equity method investment in Ascendance | (35) | - | +35 | -% |
| Other expense, net | (160) | (384) | -224 | -58% |

*Research and development expenses*

Research and development expenses increased by $5.1 million. The increase is primarily attributable to the following increases in expense: $4.2 million of consulting and outside research and services, including stock-based compensation to consultants, primarily related to regulatory and clinical trials of Asterias' AST-OPC1 and OncoCyte's cancer diagnostic tests; $3.2 million of employee compensation, including stock-based compensation and related costs; $254,000 of rent and facilities maintenance related expenses; $226,000 of travel, meals and entertainment related expenses; $183,000 of recruiting expenses; $141,000 of equipment rental and equipment maintenance related expenses; $118,000 in laboratory expenses and supplies; $82,000 in telephone and online expenses allocated to research and development expenses; $80,000 in insurance expenses allocated to research and development expense; and a net increase $282,000 in miscellaneous other expenses. These increases were in part offset by a reduction of $2.1 million of amortization of intangible assets, $1.2 million of Cell Cure related expenses, $173,000 in contract manufacturing related expenses and $59,000 of ESI related expenses.

The following table shows the approximate amounts and percentages of our total research and development expenses of $42.6 million and $37.5 million allocated to our primary research and development programs during the years ended December 31, 2015 and 2014, respectively (amounts in thousands).

| Company | Program | Amount[(1)] 2015 | Amount[(1)] 2014 | Percent 2015 | Percent 2014 |
|---|---|---|---|---|---|
| Asterias Biotherapeutics | hES-based cell therapy programs | $ 17,322 | $ 13,310 | 40.7% | 35.5% |
| BioTime and ESI | *PureStem*® hEPCs, cGMP hES cell lines, and related research products | 5,196 | 4,089 | 12.2% | 10.9% |
| BioTime | Hydrogel products and *HyStem*® research | 4,047 | 5,177 | 9.5% | 13.8% |
| BioTime | *Hextend*® | 59 | 71 | 0.1% | 0.2% |
| BioTime | *HyStem*® 3D cell culture platform for cancer drug discovery | - | 100 | -% | 0.3% |
| Cell Cure | *OpRegen*® and neurological disease therapies | 4,086 | 5,311 | 9.6% | 14.1% |
| LifeMap Sciences[(2)] | Databases and mHealth products | 5,251 | 3,567 | 12.3% | 9.5% |
| OncoCyte | Cancer diagnostics | 4,911 | 3,873 | 11.5% | 10.3% |
| OrthoCyte | Orthopedic therapy | 590 | 693 | 1.4% | 1.8% |
| ReCyte Therapeutics | Cardiovascular therapy | 1,142 | 1,342 | 2.7% | 3.6% |
| Total | | $ 42,604 | $ 37,533 | 100.0% | 100.0% |

(1) Amount also includes research and development expenses incurred directly by the subsidiary and certain general research and development expenses, such as lab supplies, lab expenses, rent allocated, and insurance allocated to research and development expenses, incurred directly by BioTime on behalf of the subsidiary and allocated to the subsidiary.

(2) Includes LifeMap Solutions, a wholly-owned subsidiary of LifeMap Sciences.

*General and administrative expenses*

General and administrative expenses for the years ended December 31, 2015 and 2014 increased by $11.6 million primarily attributable to the following increases: $5.2 million of employee compensation, including employee bonus accruals, stock-based compensation and related costs; $1.2 million of legal expenses; $1.1 million of general consulting expenses; $879,000 of investor and public relations related expenses; $648,000 of recruiting expenses; $555,000 of stock-based compensation to consultants; $861,000 of accounting, audit and tax related expense; $433,000 of cash and stock-based compensation to our independent directors; $201,000 of travel, meals and entertainment expenses; $162,000 in seminar, conference, and meeting expenses; $137,000 in office expenses and supplies; $104,000 in facilities and equipment rent and maintenance related expenses; and a net increase of $385,000 of miscellaneous other expenses. These increases were in part offset by a reduction of $119,000 of Cell Cure's related expenses.

General and administrative expenses include employee and director compensation allocated to general and administrative expenses, consulting fees other than those paid for science-related consulting, facilities and equipment rent and maintenance related expenses, insurance costs allocated to general and administrative expenses, stock exchange-related costs, depreciation expense, shipping expenses, marketing costs, legal and accounting costs, and other miscellaneous expenses which are allocated to general and administrative expense.

The following table shows the amount and approximate percentages of our total general and administrative expenses of $29.1 million and $17.6 million allocated to BioTime and our subsidiaries during the years ended December 31, 2015 and 2014, respectively (amounts in thousands).

| | Amount(1) | | Percent | |
|---|---|---|---|---|
| **Company** | **2015** | **2014** | **2015** | **2014** |
| BioTime | $ 9,752 | $ 7,130 | 33.5% | 40.6% |
| Asterias Biotherapeutics | 7,711 | 5,280 | 26.5% | 30.1% |
| BioTime Asia | 9 | 12 | -% | 0.1% |
| Cell Cure | 655 | 723 | 2.2% | 4.1% |
| ESI | 245 | 199 | 0.9% | 1.1% |
| LifeMap Sciences(2) | 5,142 | 2,554 | 17.6% | 14.5% |
| OncoCyte | 4,278 | 870 | 14.7% | 5.0% |
| OrthoCyte | 582 | 383 | 2.0% | 2.2% |
| ReCyte Therapeutics | 760 | 405 | 2.6% | 2.3% |
| Total | $ 29,134 | $ 17,556 | 100.0% | 100.0% |

(1) Amount includes general and administrative expenses incurred directly by the subsidiary and allocations from BioTime for certain general overhead expenses.

(2) Includes LifeMap Solutions.

*Interest income/(expense)* – During 2015, we earned $125,000 of interest income, net of $466,000 of interest expense. During 2014, we earned $2,600 of interest income, net of $91,000 of interest expense. Interest income is primarily attributed to interest earned on cash balances held in interest bearing accounts during the respective years.

*Gain on certain assets* – During 2015, a $3.7 million unrealized gain was generated on the sale of a certain group of assets as part of our acquisition of shares of common stock of Ascendance in December 2015.

*BioTime's share of losses in Ascendance* – During 2015, we recognized $35,000 in our share of losses from our equity method investment in Ascendance.

*Other income/(expense)* – Other expenses in 2015 consist primarily of foreign currency transaction gains and losses recognized by ESI and by Cell Cure. Other expenses in 2014 consist primarily of discount on convertible debt of $56,000, charitable donations of $36,000, $24,000 in income tax provision for LifeMap Sciences, Ltd, and $338,000 of foreign currency transaction loss.

**Income Taxes**

*Income Taxes*– Although the Asterias Deconsolidation was not a taxable transaction to us and did not result in a tax payment obligation, the $49.0 million gain on the Asterias Deconsolidation recorded by us generated a deferred tax liability that was fully offset by our net operating losses. Subsequent to the Asterias Deconsolidation, an unrealized gain of $34.3 million was recorded on the Asterias shares during the year ended December 31, 2016, which was fully offset by available net operating losses and the corresponding release of BioTime's valuation allowance on deferred tax assets. Accordingly, we did not record any provision or benefit for income taxes for the year ended December 31, 2016. The deferred tax liability generated by the Asterias shares we hold is expected to continue to be a source of taxable income as prescribed by ASC 740-10-30-17 that will more likely than not result in the realization of our deferred tax assets to the extent of those deferred tax liabilities.

We have established a full valuation allowance pertaining to our deferred tax assets presented in the consolidated balance sheet as of December 31, 2016 and 2015.

A deferred income tax benefit of $4.5 million was recorded for the year ended December 31, 2015, of which $4.8 million of the benefit was related to federal taxes and $290,000 was related to state taxes. This deferred tax benefit was wholly attributable to Asterias.

**Liquidity and Capital Resources**

At December 31, 2016, we had $22.1 million of cash and cash equivalents on hand of which $13.6 million was held by subsidiaries, including $10.2 million held by OncoCyte. We also hold Asterias shares valued at approximately $100 million as of December 31, 2016, and OncoCyte shares valued at $71 million as of February 17, 2017, that we may use for liquidity, as necessary and as market conditions allow. BioTime has no present plan to liquidate its holdings of Asterias or OncoCyte shares. The market values shown may not represent the amount that could be realized in a sale of Asterias or OncoCyte shares due to various market and regulatory factors, including trading volume or market depth factors and volume and manner of sale restrictions under Federal securities laws, prevailing market conditions and prices at the time of any sale, and subsequent sales of securities by the subsidiaries.

On February 15, 2017, we raised approximately $18.7 million, after deducting underwriting discounts, commissions and other estimated offering expenses, through the sale of 7,453,704 common shares in an underwritten public offering (the "Offering").

Since inception, we have incurred significant net losses and have funded our operations primarily through the issuance of equity securities, payments from research grants, royalties from product sales and sales of research products and services. At December 31, 2016, we had an accumulated deficit of approximately $196 million, working capital of $17 million and shareholders' equity of $131 million. We have evaluated projected cash flows for us and our subsidiaries and we believe that our cash, cash equivalents, and available for sale securities of $12.5 million (which does not include cash held by OncoCyte due to the OncoCyte Deconsolidation noted above) as of December 31, 2016, and the net proceeds of $18.7 million raised in the Offering, provide sufficient cash, cash equivalents, and working capital to carry out our current operations through at least twelve months from the issuance date of our consolidated financial statements included elsewhere in this Report.

Our projected cash flows are subject to various risks and uncertainties. For example, clinical trials being conducted by Cell Cure will be funded in part with funds from grants and not from cash on hand. If Cell Cure were to lose its grant funding or we are unable to continue to provide working capital to Cell Cure, or both, Cell Cure may be required to delay, postpone, or cancel its clinical trials or limit the number of clinical trial sites, or otherwise reduce or curtail its operations unless it is able to obtain adequate financing from another source that could be used for its clinical trial. The unavailability or inadequacy of financing to meet future capital needs could force us to modify, curtail, delay, or suspend some or all aspects of our planned operations. Our determination as to when we will seek new financing and the amount of financing that we will need will be based on our evaluation of the progress we make in our research and development programs, any changes to the scope and focus of those programs, and our projection of future costs, revenues, and rates of expenditure. We cannot assure that adequate financing will be available on favorable terms, if at all. Sales of additional equity securities by us or our subsidiaries could result in the dilution of the interests of present shareholders.

***Cash used in operating activities***

During 2016, our total research and development expenses were $36.1 million and our general and administrative expenditures were $28.4 million. Net income attributable to BioTime for the year ended December 31, 2016 amounted to $33.6 million. Net cash used in operating activities during this period amounted to $42.3 million. The difference between the net income and net cash used in operating activities during the year ended December 31, 2016 was primarily attributable to the following noncash items: $15.0 million loss attributable to non-controlling interests, gain of $49.0 million related to the Asterias Deconsolidation, unrealized gain of $34.4 million recorded for the increase in fair value of our Asterias shares from May 13, 2016 through December 31, 2016, offset in part by $8 million of stock-based compensation expense recognized for employees, consultants and directors, $3.6 million of amortization of intangible assets, amortization of $1.5 million in deferred grant income, $1.2 million of depreciation expenses, $1.0 million of bad debt expenses from trade and other receivables, including receivables from Ascendance, $3.1 million noncash warrant expense relating to warrants issued to Asterias shareholders in March 2016 and $4.7 million loss on impairment of our Ascendance equity method investment. Changes in working capital impacted our cash used in operations by $0.7 million as a net use of cash.

For the period January 1, 2017 through February 16, 2017, OncoCyte's cash used in operating activities will be included in our consolidated cash used in operations. Beginning on February 17, 2017, due to the OncoCyte Deconsolidation, we will no longer include OncoCyte's cash used in operating activities with our consolidated cash used in operations.

***Cash used in investing activities***

During the year ended December 31, 2016, $10.9 million was used for investing activities. The primary components of this use of cash were $8.4 million resulting from the deconsolidation of Asterias cash and cash equivalents, and $2.5 million used to purchase property and equipment, including leasehold improvements to our Alameda lease.

For the period January 1, 2017 through February 16, 2017, OncoCyte's cash used in investing activities will be included in our consolidated cash used in investing activities. Beginning on February 17, 2017, due to the OncoCyte Deconsolidation, we will no longer include OncoCyte's cash used in investing activities with our consolidated cash used in investing activities.

***Cash provided by financing activities***

During the year ended December 31, 2016, net cash provided by financing activities was approximately $32.8 million. The primary sources of cash provided by financing activities were: net proceeds of $18.6 million from the sale of common shares in an underwritten public offering, $9.8 million in net proceeds from OncoCyte's sale of its common stock and warrants to purchase OncoCyte common stock, $2.2 million in proceeds from exercise of subsidiary stock options principally by Asterias option holders prior to the Asterias Deconsolidation, and $1.8 million in proceeds from the issuance of convertible debt by Cell Cure to its shareholders other than us.

For the period January 1, 2017 through February 16, 2017, OncoCyte's cash flows from financing activities, if any, will be included in our consolidated cash flows from financing activities. Beginning on February 17, 2017, due to the OncoCyte Deconsolidation, we will no longer include OncoCyte's cash flows from financing activities with our consolidated cash flows from financing activities.

***Contractual obligations***

As of December 31, 2016, our contractual obligations for the next five years and thereafter were as follows (in thousands):

| | Payments Due by Period | | | | |
|---|---|---|---|---|---|
| **Contractual Obligations** [(1)] | **Total** | **Less Than 1 Year** | **1-3 Years** | **4-5 Years** | **After 5 Years** |
| Operating leases [(2)] | $ 6,132 | $ 1,098 | $ 2,087 | $ 1,945 | $ 1,002 |
| Capital lease [(3)] | 512 | 202 | 310 | - | - |
| Promissory notes | 219 | 99 | 120 | - | - |
| Convertible debt to noncontrolling shareholders of Cell Cure | 2,544 | 1,076 | 1,468 | - | - |
| Total | $ 9,407 | $ 2,475 | $ 3,985 | $ 1,945 | $ 1,002 |

(1) This table does not include payments to key employees that could arise if they were involuntary terminated or if their employment terminated following a change in control.

(2) Includes the lease of our principal office and laboratory facilities in Alameda, California, including the lease liability, leases of the offices and laboratory facilities of LifeMap Sciences, Cell Cure and other operating leases of lab equipment. See Note 11 to our consolidated financial statements regarding the lease liability.

(3) Includes capital lease of lab equipment.

**Off-Balance Sheet Arrangements**

As of December 31, 2016, we did not have any off-balance sheet arrangements, as defined in Item 303(a) (4) (ii) of SEC Regulation S-K.

## Item 7A. Quantitative and Qualitative Disclosures about Market Risk

***Foreign Currency Exchange Risk***

We are exposed to some foreign exchange currency risks because we have subsidiaries that are located in foreign countries. We do not engage in foreign currency hedging activities. Because we translate foreign currencies into United States dollars for reporting purposes, currency fluctuations have an impact on our financial results. We believe that our exposure to currency exchange fluctuation risk is mitigated by the fact that our foreign subsidiaries pay their financial obligations almost exclusively in their local currency. As of December 31, 2016, currency exchange rates did not have a material impact on our intercompany transactions with our foreign subsidiaries. However, a weakening of the dollar against the foreign exchange used in the home countries of our foreign subsidiaries could increase our cost of providing additional financing to our foreign subsidiaries in the future. Conversely, a strengthening of the dollar would decrease our cost of making additional investments in those subsidiaries.

***Credit Risk***

We and our subsidiaries place some cash in checking accounts in U.S. banks and invest most of our cash in money market funds. Deposits with banks may temporarily exceed the amount of insurance provided on such deposits. We will monitor the cash balances in the accounts and adjust the cash balances as appropriate, but if the amount of a deposit at any time exceeds the federally insured amount at a bank, the uninsured portion of the deposit could be lost, in whole or in part, if the bank were to fail. Investments in money market funds are not insured or guaranteed by the United States government or any of its agencies.

Our foreign subsidiaries deposit their cash in local banks, but if the amount of a deposit at any time exceeds the amount at a bank under the national banking insurance laws, the uninsured portion of the deposit could be lost, in whole or in part, if the bank were to fail.

***Interest Rate Risk***

We and our subsidiaries (other than OncoCyte) invest most of our cash in money market funds. The primary objective of our investments will be to preserve principal and liquidity while earning a return on our invested capital, without incurring significant risks. Our future investment income is not guaranteed and may fall short of expectations due to changes in prevailing interest rates, or we may suffer losses in principal if the net asset value of a money market fund falls below $1 per share.

***Equity Method Accounting for Asterias and OncoCyte shares at fair value***

We account for our Asterias and OncoCyte shares using the equity method of accounting fair value option. The value of those shares is subject to changes in the stock prices. Asterias and OncoCyte common stock trade on the NYSE MKT under the ticker symbols “AST” and “OCX”, respectively.

## REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Shareholders
BioTime, Inc.

We have audited the accompanying consolidated balance sheets of BioTime, Inc. and Subsidiaries (collectively, the "Company") as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive loss, shareholders' equity, and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of BioTime, Inc. and Subsidiaries at December 31, 2016 and 2015, and the results of their operations and their cash flows for each of the three years in the period ended December 31, 2016.

As discussed in Notes 2 and 12 to the consolidated financial statements, in 2016 the Company changed the classification of deferred taxes in the consolidated balance sheets due to the adoption of ASU 2015-17, *Balance Sheet Classification of Deferred Taxes*. This change was applied retrospectively to all periods presented.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), BioTime Inc. and Subsidiaries' internal control over financial reporting as of December 31, 2016, based on criteria established in *Internal Control – Integrated Framework* (2013 *)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) and our report dated March 16, 2017 expressed an unqualified opinion thereon.

/s/ OUM & CO. LLP

San Francisco, California
March 16, 2017

**REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

Board of Directors and Shareholders
BioTime, Inc.

We have audited the internal control over financial reporting of BioTime, Inc. and Subsidiaries (collectively, the "Company") as of December 31, 2016 and 2015, based on criteria established in *Internal Control – Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Item 9A, *Management's Report on Internal Control Over Financial Reporting*. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

We conducted our audit in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audit also included performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

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

In our opinion, BioTime, Inc. and Subsidiaries maintained, in all material respects, effective internal control over financial reporting as of December 31, 2016, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of BioTime, Inc. and Subsidiaries as of December 31, 2016 and 2015, and the related consolidated statements of operations, comprehensive loss, changes in shareholders' equity, and cash flows for each of the three years in the period ended December 31, 2016 and our report dated March 16, 2017 expressed an unqualified opinion thereon.

/s/ OUM & CO. LLP

San Francisco, California
March 16, 2017

**Item 8. Financial Statements and Supplementary Data**

**BIOTIME, INC. AND SUBSIDIARIES**
**CONSOLIDATED BALANCE SHEETS**
**(IN THOUSANDS)**

| ASSETS | December 31, 2016 (Notes 1 and 3) | December 31, 2015 (Note 12) |
|---|---|---|
| CURRENT ASSETS | | |
| Cash and cash equivalents | $ 22,088 | $ 42,229 |
| Available for sale securities | 627 | 753 |
| Trade accounts and grants receivable, net | 446 | 1,078 |
| Landlord receivable | 200 | 567 |
| Receivable from affiliates | 511 | - |
| Prepaid expenses and other current assets | 1,777 | 2,610 |
| Total current assets | 25,649 | 47,237 |
| | | |
| Property, plant and equipment, net | 5,529 | 7,539 |
| Deferred license fees | 118 | 322 |
| Deposits and other long-term assets | 1,031 | 1,299 |
| Equity method investment in Asterias, at fair value (Note 4) | 100,039 | - |
| Equity method investment in Ascendance | - | 4,671 |
| Intangible assets, net | 10,206 | 33,592 |
| TOTAL ASSETS | $ 142,572 | $ 94,660 |
| | | |
| **LIABILITIES AND SHAREHOLDERS' EQUITY** | | |
| CURRENT LIABILITIES | | |
| Accounts payable and accrued liabilities | $ 7,144 | $ 9,377 |
| Capital lease liability, current portion | 202 | 38 |
| Promissory notes, current portion | 99 | 95 |
| Related party convertible debt | 833 | - |
| Deferred grant income | - | 2,513 |
| Deferred license and subscription revenue, current portion | 572 | 439 |
| Total current liabilities | 8,850 | 12,462 |
| | | |
| LONG-TERM LIABILITIES | | |
| Deferred revenues, net of current portion | 308 | 615 |
| Deferred rent liabilities, net of current portion | 50 | 158 |
| Lease liability | 1,386 | 4,400 |
| Capital lease liability, net of current portion | 310 | 26 |
| Related party convertible debt, net of discount | 1,032 | 324 |
| Promissory notes, net of current portion | 120 | 220 |
| Other long term liabilities | 8 | 8 |
| TOTAL LIABILITIES | 12,064 | 18,213 |
| | | |
| Commitments and contingencies (Note 11) | | |
| | | |
| SHAREHOLDERS' EQUITY | | |
| Series A convertible preferred stock, no par value, authorized 2,000 shares as of December 31, 2016 and 2015; none issued and outstanding as of December 31, 2016 and 2015, respectively | - | - |
| Common stock, no par value, authorized 150,000 shares; issued and outstanding shares; 103,396 shares issued and 102,776 outstanding as of December 31, 2016 and 94,894 issued and 90,421 outstanding as of December 31, 2015 | 317,878 | 273,979 |
| Accumulated other comprehensive loss | (738) | (237) |
| Accumulated deficit | (196,321) | (229,893) |
| Treasury stock at cost: 620 and 4,473 shares at December 31, 2016 and 2015, respectively | (2,891) | (18,033) |
| BioTime, Inc. shareholders' equity | 117,928 | 25,816 |
| Noncontrolling interest | 12,580 | 50,631 |
| Total shareholders' equity | 130,508 | 76,447 |
| TOTAL LIABILITIES AND SHAREHOLDERS' EQUITY | $ 142,572 | $ 94,660 |

See accompanying notes to the consolidated financial statements.

**BIOTIME, INC. AND SUBSIDIARIES**
**CONSOLIDATED STATEMENTS OF OPERATIONS**
**(IN THOUSANDS, EXCEPT PER SHARE DATA)**

| | Year Ended December 31, | | |
|---|---|---|---|
| **REVENUES:** | **2016** | **2015** | **2014** |
| Grant income | $ 3,671 | $ 4,502 | $ 3,297 |
| Royalties from product sales and license fees | 544 | 719 | 398 |
| Subscription and advertisement | 972 | 1,357 | 1,173 |
| Sale of research products and services | 736 | 458 | 376 |
| Total revenues | 5,923 | 7,036 | 5,244 |
| Cost of sales | (358) | (1,107) | (837) |
| Gross profit | 5,565 | 5,929 | 4,407 |
| **OPERATING EXPENSES:** | | | |
| Research and development | (36,106) | (42,604) | (37,533) |
| General and administrative | (28,426) | (29,134) | (17,556) |
| Total operating expenses | (64,532) | (71,738) | (55,089) |
| Loss from operations | (58,967) | (65,809) | (50,682) |
| **OTHER INCOME/(EXPENSES):** | | | |
| Interest expense, net | (747) | (340) | (89) |
| BioTime's share of losses and impairment in equity method investment in Ascendance | (4,671) | (35) | - |
| Gain on deconsolidation of Asterias (Note 3) | 49,048 | - | |
| Gain on equity method investment in Asterias at fair value (Note 4) | 34,361 | - | - |
| Gain on investment | - | 3,694 | - |
| Other income/(expense), net | (403) | (160) | (384) |
| Total other income/(expense), net | 77,588 | 3,159 | (473) |
| INCOME (LOSS) BEFORE INCOME TAX BENEFIT | 18,621 | (62,650) | (51,155) |
| Deferred income tax benefit | - | 4,516 | 7,376 |
| NET INCOME (LOSS) | 18,621 | (58,134) | (43,779) |
| Net loss attributable to noncontrolling interest | 14,951 | 11,143 | 7,367 |
| **NET INCOME (LOSS) ATTRIBUTABLE TO BIOTIME, INC.** | 33,572 | (46,991) | (36,412) |
| Dividends on preferred shares | - | (415) | (87) |
| **NET INCOME (LOSS) ATTRIBUTABLE TO BIOTIME, INC. COMMON SHAREHOLDERS** | $ 33,572 | $ (47,406) | $ (36,499) |
| NET INCOME (LOSS) PER COMMON SHARE: | | | |
| BASIC | $ 0.35 | $ (0.59) | $ (0.55) |
| DILUTED | $ 0.34 | $ (0.59) | $ (0.55) |
| WEIGHTED AVERAGE NUMBER OF SHARES OF COMMON STOCK OUTSTANDING: | | | |
| BASIC | 97,316 | 79,711 | 66,467 |
| DILUTED | 99,553 | 79,711 | 66,467 |

See accompanying notes to the consolidated financial statements.

**BIOTIME, INC. AND SUBSIDIARIES**
**CONSOLIDATED STATEMENTS OF COMPREHENSIVE LOSS**
**(IN THOUSANDS)**

| | Years ended December 31, | | |
|---|---|---|---|
| | **2016** | **2015** | **2014** |
| **NET INCOME (LOSS)** | $ 18,621 | $ (58,134) | $ (43,779) |
| Other comprehensive income/(loss), net of tax: | | | |
| Foreign currency translation adjustment, net of tax | (106) | (424) | 125 |
| Available for sale investments: | | | |
| Unrealized (loss)/gain on available for sale securities, net of taxes | (395) | 1 | (1) |
| **COMPREHENSIVE INCOME (LOSS)** | 18,120 | (58,557) | (43,655) |
| Less: comprehensive loss attributable to noncontrolling interest | 14,951 | 11,143 | 7,367 |
| **COMPREHENSIVE INCOME (LOSS) ATTRIBUTABLE TO BIOTIME, INC. COMMON SHAREHOLDERS BEFORE PREFERRED STOCK DIVIDEND** | 33,071 | (47,414) | (36,288) |
| Preferred stock dividend | - | (415) | (87) |
| **COMPREHENSIVE INCOME (LOSS) ATTRIBUTABLE TO BIOTIME, INC. COMMON SHAREHOLDERS** | $ 33,071 | $ (47,829) | $ (36,375) |

See accompanying notes to the consolidated financial statements.

# BIOTIME, INC. AND SUBSIDIARIES
# CONSOLIDATED STATEMENTS OF CHANGES IN SHAREHOLDERS' EQUITY
# (IN THOUSANDS)

| | Preferred Shares | | Common Shares | | Treasury Shares | | | | | Accumulated | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Number of Shares | Amount | Number of Shares | Amount | Number of Shares | Amount | Contributed Capital | Accumulated Deficit | Noncontrolling Interest | Other Comprehensive Income/(Loss) | Total Shareholders' Equity |
| BALANCE AT DECEMBER 31, 2013 | - | $ - | 67,412 | $ 203,456 | (10,698) | $ (43,034) | $ 94 | $ (145,778) | $ 27,461 | $ 62 | $ 42,261 |
| Sale of common shares, net of fees paid and amortized | - | - | 14,173 | 43,827 | - | - | - | - | - | - | 43,827 |
| Exercise of options | - | - | 2,060 | 1,192 | - | - | - | - | - | - | 1,192 |
| Shares retired as part of exercise of options | - | - | (367) | (973) | - | - | - | - | - | - | (973) |
| Shares retired to pay for employee's taxes | - | - | (156) | (415) | - | - | - | - | - | - | (415) |
| Tax liability on treasury shares sold by Asterias | - | - | - | (3,611) | - | - | - | - | - | - | (3,611) |
| Stock options granted for compensation | - | - | - | 2,409 | - | - | - | - | - | - | 2,409 |
| Stock options granted for compensation in subsidiaries | - | - | - | - | - | - | - | - | 1,808 | - | 1,808 |
| Restricted stock granted for compensation | - | - | - | - | - | - | - | - | 234 | - | 234 |
| Subsidiary warrants issued to outside investors as part of sale of treasury stock | - | - | - | - | - | - | - | - | 3,184 | - | 3,184 |
| Sale of treasury stock | - | - | - | (11,042) | 5,804 | 23,144 | - | - | - | - | 12,102 |
| Sale of preferred stock | 70 | 3,500 | - | - | - | - | - | - | - | - | 3,500 |
| Dividends on preferred stock | - | - | - | - | - | - | (87) | - | - | - | (87) |
| Exercise of subsidiary options | - | - | - | - | - | - | - | - | 8 | - | 8 |
| Outside investment in subsidiary with cash | - | - | - | - | - | - | - | - | 939 | - | 939 |
| Foreign currency translation adjustment | - | - | - | - | - | - | - | - | - | 125 | 125 |
| Unrealized loss on available-for-sale securities | - | - | - | - | - | - | - | - | - | (1) | (1) |
| NET LOSS | - | - | - | - | - | - | - | (36,412) | (7,367) | - | (43,779) |
| BALANCE AT DECEMBER 31, 2014 | 70 | $ 3,500 | 83,122 | $ 234,843 | (4,894) | $ (19,890) | $ 7 | $ (182,190) | $ 26,267 | $ 186 | $ 62,723 |
| Sale of common shares, net of fees paid and amortized | - | - | 10,738 | 33,897 | - | - | - | - | - | - | 33,897 |
| Exercise of options | - | - | 155 | 621 | - | - | - | - | - | - | 621 |
| Warrants exercised | - | - | 4 | 19 | - | - | - | - | - | - | 19 |
| Stock options granted for compensation | - | - | - | 2,003 | - | - | - | - | - | - | 2,003 |
| Stock options granted for compensation in subsidiaries | - | - | - | - | - | - | - | - | 8,223 | - | 8,223 |
| Restricted stock granted for compensation | - | - | - | - | - | - | - | - | 822 | - | 822 |
| Dividend in kind | - | - | - | - | - | - | - | (712) | 712 | - | - |
| Subsidiary shares retired to pay for employee's taxes | - | - | - | - | - | - | - | - | (98) | - | (98) |
| Subsidiary warrants exercised | - | - | - | - | - | - | - | - | 11,700 | - | 11,700 |
| Contingently issuable subsidiary warrants | - | - | - | - | - | - | - | - | 65 | - | 65 |
| Sale of treasury stock | - | - | - | (496) | 421 | 1,857 | - | - | - | - | 1,361 |
| Conversion of preferred stock to common stock | (70) | (3,500) | 875 | 3,500 | - | - | - | - | - | - | - |
| Dividends on preferred stock | - | - | - | (408) | - | - | (7) | - | - | - | (415) |
| Exercise of subsidiary options | - | - | - | - | - | - | - | - | 33 | - | 33 |
| Subsidiary shares issued in lieu of cash for services received | - | - | - | - | - | - | - | - | 486 | - | 486 |
| Outside investment in OncoCyte and Cell Cure | - | - | - | - | - | - | - | - | 3,918 | - | 3,918 |
| Sale of subsidiary shares at- the- market, net of fees paid and amortized | - | - | - | - | - | - | - | - | 9,646 | - | 9,646 |
| Foreign currency translation adjustment | - | - | - | - | - | - | - | - | - | (424) | (424) |
| Unrealized loss on available-for-sale securities | - | - | - | - | - | - | - | - | - | 1 | 1 |
| NET LOSS | - | - | - | - | - | - | - | (46,991) | (11,143) | - | (58,134) |
| BALANCE AT DECEMBER 31, 2015 | - | $ - | 94,894 | $ 273,979 | (4,473) | $ (18,033) | $ - | $ (229,893) | $ 50,631 | $ (237) | $ 76,447 |
| Sale of common shares, net of financing fees | - | - | 8,420 | 18,606 | - | - | - | - | - | - | 18,606 |
| Common shares issued for executive bonus in lieu of cash | - | - | 68 | 200 | - | - | - | - | - | - | 200 |
| Common shares issued for consulting services in lieu of cash | - | - | 14 | 40 | - | - | - | - | - | - | 40 |
| Stock-based compensation | - | - | - | 2,731 | - | - | - | - | - | - | 2,731 |
| Stock-based compensation in subsidiaries | - | - | - | - | - | - | - | - | 5,220 | - | 5,220 |
| Deconsolidation of Asterias | - | - | - | - | 3,853 | 15,142 | - | - | (21,752) | - | (6,610) |
| Subsidiary financing transactions with noncontrolling interests – Asterias | - | - | - | 18,310 | - | - | - | - | (18,310) | - | - |
| Subsidiary financing transactions with noncontrolling interests – OncoCyte | - | - | - | 4,012 | - | - | - | - | (4,012) | - | - |
| Distribution of Asterias warrants to its shareholders other than BioTime | - | - | - | - | - | - | - | - | 3,125 | - | 3,125 |
| Exercise of subsidiary options | - | - | - | - | - | - | - | - | 2,151 | - | 2,151 |
| Sale of common shares and warrants by OncoCyte, net of financing fees | - | - | - | - | - | - | - | - | 9,777 | - | 9,777 |
| Beneficial conversion feature on convertible debt issued to Cell Cure's noncontrolling interests | - | - | - | - | - | - | - | - | 701 | - | 701 |
| Foreign currency translation adjustment | - | - | - | - | - | - | - | - | - | (106) | (106) |
| Unrealized loss on available-for-sale securities | - | - | - | - | - | - | - | - | - | (395) | (395) |
| NET INCOME | - | - | - | - | - | - | - | 33,572 | (14,951) | - | 18,621 |
| BALANCE AT DECEMBER 31, 2016 | - | $ - | 103,396 | $ 317,878 | (620) | $ (2,891) | $ - | $ (196,321) | $ 12,580 | $ (738) | $ 130,508 |

See accompanying notes to the consolidated financial statements.

**BIOTIME, INC. AND SUBSIDIARIES**
**CONSOLIDATED STATEMENTS OF CASH FLOWS**
**(IN THOUSANDS)**

| | Year Ended December 31, | | |
|---|---|---|---|
| | **2016** | **2015** | **2014** |
| CASH FLOWS FROM OPERATING ACTIVITIES: | | | |
| Net income (loss) attributable to BioTime, Inc. | $ 33,572 | $ (46,991) | $ (36,412) |
| Net loss allocable to non-controlling interest | (14,951) | (11,143) | (7,367) |
| Adjustments to reconcile net income (loss) attributable to BioTime, Inc. to net cash used in operating activities: | | | |
| Gain on deconsolidation of Asterias (Note 3) | (49,048) | - | - |
| Unrealized gain on equity method investment in Asterias at fair value | (34,361) | - | - |
| BioTime's share of losses and impairment of Ascendance | 4,671 | 35 | - |
| Gain on sale of assets | - | (3,694) | - |
| Depreciation expense, including amortization of leasehold improvements | 1,180 | 1,078 | 1,051 |
| Amortization of intangible assets | 3,577 | 5,256 | 7,360 |
| Amortization of deferred grant income | 1,496 | - | - |
| Amortization of deferred consulting fees | - | - | 19 |
| Amortization of deferred license fees | 113 | 114 | 110 |
| Amortization of deferred license, royalty and subscription revenues | (308) | 102 | (1) |
| Amortization of prepaid rent in common stock | - | 63 | 85 |
| Stock-based compensation | 7,951 | 11,050 | 4,455 |
| Subsidiary shareholder expense for subsidiary warrants | 3,125 | - | - |
| Subsidiary common stock issued in lieu of cash for services | - | 486 | - |
| Amortization of discount on related party convertible debt | 448 | 245 | 56 |
| Bad debt expense | 950 | - | (16) |
| Deferred income tax benefit | - | (4,516) | (7,376) |
| Other | - | 66 | 9 |
| Changes in operating assets and liabilities: | | | |
| Accounts receivable, net | (39) | (248) | (74) |
| Grant receivable | 226 | 168 | 11 |
| Inventory | - | (75) | (87) |
| Prepaid expenses and other current assets | (1,115) | (1,458) | (86) |
| Other long-term assets | - | (100) | - |
| Accounts payable and accrued liabilities | 12 | 1,673 | (470) |
| Accrued interest on related party convertible debt | - | 19 | 4 |
| Other long-term liabilities | (56) | (20) | (160) |
| Deferred grant income | - | 2,513 | - |
| Deferred rent liabilities | 99 | 61 | 61 |
| Deferred revenues | 132 | 772 | (26) |
| Net cash used in operating activities | (42,326) | (44,544) | (38,854) |
| | | | |
| CASH FLOWS FROM INVESTING ACTIVITIES: | | | |
| Deconsolidation of cash and cash equivalents of Asterias | (8,376) | - | - |
| Purchase of property and equipment | (2,248) | (1,241) | (483) |
| Payments on construction in progress | (278) | (4,093) | (219) |
| Purchase of foreign available-for-sale securities | - | (748) | - |
| Payment for Ascendance equity method investment | - | (500) | - |
| Proceeds from the sale of equipment | - | - | 9 |
| Security deposit paid, net | 13 | (859) | (315) |
| Net cash used in investing activities | (10,889) | (7,441) | (1,008) |

| | Year Ended December 31, 2016 | 2015 | 2014 |
|---|---|---|---|
| CASH FLOWS FROM FINANCING ACTIVITIES: | | | |
| Proceeds from exercises of stock options | - | 621 | 219 |
| Proceeds from sale of preferred stock | - | - | 3,500 |
| Proceeds from issuance of common shares | 20,125 | 34,123 | 44,150 |
| Fees paid on sale of common shares | (1,515) | - | (323) |
| Proceeds from exercise of warrants | - | 20 | - |
| Proceeds from exercise of subsidiary stock options | 2,151 | 33 | 8 |
| Proceeds from sale of treasury shares | - | 1,347 | - |
| Proceeds from exercise of subsidiary warrants | - | 11,700 | - |
| Proceeds from sale of treasury shares and issuance of subsidiary warrants | - | - | 15,156 |
| Proceeds from sale of subsidiary common shares | 171 | 13,639 | 468 |
| Fees paid on sale of subsidiary common shares | (106) | (693) | - |
| Reimbursement from landlord on construction in progress | 567 | 3,789 | - |
| Proceeds from issuance of related party convertible debt | 1,757 | 255 | 471 |
| Proceeds for the sale of common shares and warrants of subsidiary | 10,550 | - | - |
| Fees paid on sale of common shares and warrants of subsidiary | (773) | - | - |
| Repayment of capital lease obligation | (145) | (59) | (26) |
| Net cash provided by financing activities | 32,782 | 64,775 | 63,623 |
| Effect of exchange rate changes on cash and cash equivalents | 292 | (48) | 230 |
| NET INCREASE (DECREASE) IN CASH AND CASH EQUIVALENTS | (20,141) | 12,742 | 23,991 |
| CASH AND CASH EQUIVALENTS: | | | |
| At beginning of year | 42,229 | 29,487 | 5,496 |
| At end of year | $ 22,088 | $ 42,229 | $ 29,487 |
| SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION: | | | |
| Cash paid during year for interest | $ 94 | $ 119 | $ 91 |
| SUPPLEMENTAL SCHEDULE OF NONCASH FINANCING AND INVESTING ACTIVITIES: | | | |
| Employee options exercised with common stock | $ | $ - | $ 973 |
| Capital expenditure funded by capital lease borrowing | 626 | 34 | 115 |
| Construction in progress in accounts payable and accrued expenses | | 524 | 186 |
| Landlord receivable | | (567) | (378) |
| Lease liability | 1,385 | 4,400 | 378 |
| Conversion of preferred stock to common stock | - | 3,500 | - |
| Promissory notes in exchange of preferred share dividends | - | 363 | - |
| Common stock issued in lieu of cash for bonus and services | 240 | - | - |
| Equity method investment in Ascendance in exchange for assets | - | 4,706 | - |

See accompanying notes to the consolidated financial statements.

## NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

### 1. Organization, Basis of Presentation and Liquidity

*General* – BioTime is a clinical-stage biotechnology company focused on developing and commercializing products addressing degenerative diseases. BioTime's clinical programs are based on two platform technologies. The foundation of BioTime's core therapeutic technology platform is pluripotent cells that are capable of becoming any of the cell types in the human body. The foundation of BioTime's cell delivery platform is its *HyStem*® 3-D cell and drug delivery matrix technology. BioTime's current clinical programs are targeting three primary sectors, aesthetics, ophthalmology and cell/drug delivery.

BioTime also has significant equity holdings in two publicly traded companies, Asterias Biotherapeutics, Inc. ("AST") and OncoCyte Corporation ("OCX"), which BioTime founded and, until recently, were majority-owned and consolidated subsidiaries. Asterias (NYSE MKT: AST) is presently focused on advancing three clinical-stage programs that have the potential to address areas of high unmet medical need in the fields of neurology (spinal cord injury) and oncology (acute myeloid leukemia and lung cancer). OncoCyte (NYSE MKT: OCX) is developing confirmatory diagnostic tests for lung cancer, breast cancer, and bladder cancer utilizing novel liquid biopsy technology.

BioTime is also enabling early-stage programs in other new technologies through its own research programs as well as through other subsidiaries or affiliates.

As further discussed in Notes 3 and 4, effective May 13, 2016, BioTime deconsolidated Asterias financial statements and results of operations due to the decrease in BioTime's percentage ownership in Asterias from 57.1% to 48.7% as a result of Asterias' public offering of its common stock to raise capital for its operations (the "Asterias Deconsolidation"). Since May 13, 2016, BioTime has accounted for the Asterias common stock it holds using the equity method of accounting at fair value.

As further discussed in Note 16, on February 17, 2017, BioTime's ownership of OncoCyte declined below 50% and BioTime deconsolidated the financial statements of OncoCyte from its consolidated financial statements. Beginning on February 17, 2017, BioTime will account for OncoCyte using the equity method of accounting at fair value.

*Use of estimates* - The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the U.S. ("GAAP") requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period with consideration given to materiality. Significant estimates and assumptions which are subject to significant judgment include those related to going concern assessment of consolidated financial statements, useful lives associated with long-lived assets, including evaluation of asset impairment, allowances for uncollectible accounts receivables, valuing investments in nonconsolidated investees using the equity method, loss contingencies, deferred income taxes and tax reserves, including valuation allowances related to deferred income taxes, and assumptions used to value stock-based awards, debt or other equity instruments. Actual results could differ materially from those estimates.

*Principles of consolidation* – BioTime's consolidated financial statements include the accounts of its subsidiaries. The following table reflects BioTime's ownership, directly or through one or more subsidiaries, of the outstanding shares of its operating subsidiaries as of December 31, 2016.

| **Subsidiary** | **Field of Business** | **BioTime Ownership** | **Country** |
|---|---|---|---|
| Cell Cure Neurosciences Ltd. | Products to treat age-related macular degeneration | 62.5%(1) | Israel |
| ES Cell International Pte. Ltd. | Stem cell products for research, including clinical grade cell lines produced under cGMP | 100% | Singapore |
| LifeMap Sciences, Inc. | Biomedical, gene, disease, and stem cell databases and tools | 77.9% | USA |
| LifeMap Sciences, Ltd. | Biomedical, gene, disease, and stem cell databases and tools | (2) | Israel |
| LifeMap Solutions, Inc. | Mobile health software | (2) | USA |
| OncoCyte Corporation (3) | Cancer diagnostics | 51.1% | USA |
| OrthoCyte Corporation | Developing bone grafting products for orthopedic diseases and injuries | 100% | USA |
| ReCyte Therapeutics, Inc. | Research and development involved in stem cell-derived endothelial and cardiovascular related progenitor cells for the treatment of vascular disorders, ischemic conditions and brown adipocytes for type-2 diabetes and obesity | 94.8% | USA |

(1) Includes shares owned by BioTime and ES Cell International Pte. Ltd.

(2) LifeMap Sciences, Ltd. and LifeMap Solutions, Inc. are wholly-owned subsidiaries of LifeMap Sciences, Inc.

(3) See Note 16. Beginning February 17, 2017, BioTime deconsolidated OncoCyte and OncoCyte is no longer a subsidiary of BioTime as of that date.

All material intercompany accounts and transactions have been eliminated in consolidation. As of December 31, 2016, BioTime consolidated ReCyte Therapeutics, Inc. ("ReCyte"), OncoCyte, OrthoCyte Corporation ("OrthoCyte"), ES Cell International Pte. Ltd. ("ESI"), Cell Cure Neurosciences Ltd ("Cell Cure"), BioTime Asia, Limited ("BioTime Asia"), LifeMap Sciences, Inc. ("LifeMap Sciences"), LifeMap Sciences, Ltd., and LifeMap Solutions, Inc. ("LifeMap Solutions") as BioTime has the ability to control their operating and financial decisions and policies through its ownership, and the noncontrolling interest is reflected as a separate element of shareholders' equity on BioTime's consolidated balance sheets.

*Liquidity* – Since inception, BioTime has incurred significant operating losses and has funded its operations primarily through the issuance of equity securities, payments from research grants, royalties from product sales and sales of research products and services. At December 31, 2016, BioTime had an accumulated deficit of approximately $196 million, working capital of $17 million and shareholders' equity of $131 million. BioTime has evaluated its projected cash flows and believes that its cash, cash equivalents, and available for sale securities of $12.5 million (not including cash held by OncoCyte) as of December 31, 2016, and the net proceeds of $18.7 million raised in the underwritten public offering on February 15, 2017 (see Note 16), provide sufficient cash, cash equivalents, and working capital to carry out BioTime's current operations through at least twelve months from the issuance date of the consolidated financial statements included herein.

BioTime's projected cash flows are subject to various risks and uncertainties. For example, clinical trials being conducted by Cell Cure will be funded in part with funds from grants and not from cash on hand. If Cell Cure were to lose its grant funding or BioTime is unable to continue to provide working capital to Cell Cure, or both, it may be required to delay, postpone, or cancel its clinical trials or limit the number of clinical trial sites, or otherwise reduce or curtail its operations unless it is able to obtain adequate financing from another source that could be used for its clinical trial. The unavailability or inadequacy of financing to meet future capital needs could force BioTime to modify, curtail, delay, or suspend some or all aspects of its planned operations. BioTime's determination as to when it will seek new financing and the amount of financing that it will need will be based on BioTime's evaluation of the progress its makes in its research and development programs, any changes to the scope and focus of those programs, and projection of future costs, revenues, and rates of expenditure. BioTime cannot assure that adequate financing will be available on favorable terms, if at all. Sales of additional equity securities by BioTime or its subsidiaries could result in the dilution of the interests of present shareholders.

**2. Summary of Significant Accounting Policies**

*Going concern assessment* – With the implementation of FASB's new standard on going concern, ASU No. 2014-15, beginning with the year ended December 31, 2016 and all annual and interim periods thereafter, BioTime will assess going concern uncertainty for its consolidated financial statements to determine if BioTime has sufficient cash and cash equivalents on hand and working capital to operate for a period of at least one year from the date the consolidated financial statements are issued or are available to be issued, which is referred to as the "look-forward period" as defined by ASU No. 2014-15. As part of this assessment, based on conditions that are known and reasonably knowable to BioTime, BioTime will consider various scenarios, forecasts, projections, and estimates, and BioTime will make certain key assumptions, including the timing and nature of projected cash expenditures or programs, and its ability to delay or curtail those expenditures or programs, if necessary, among other factors. Based on this assessment, as necessary or applicable, BioTime makes certain assumptions concerning its ability to curtail or delay research and development programs and expenditures within the look-forward period in accordance with ASU No. 2014-15.

*Revenue recognition* – BioTime complies with Accounting Standards Codification, ASC 605-10 and recognizes revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable, and collectability is reasonably assured. Grant income is recognized when the related research and development expenses are incurred. Revenues from the sale of research products and services are primarily derived from the sale of hydrogels and stem cell products and are recognized when earned. Royalty revenues consist of product royalty payments. Royalties earned on product sales are recognized as revenue in the quarter in which the royalty reports are received from the licensee, rather than the quarter in which the sales took place. License fee revenues consist primarily of subscription and advertising revenue from LifeMap Sciences' online databases and are recognized based upon applicable subscription or advertising periods. When BioTime or a subsidiary is entitled to receive up-front nonrefundable licensing or similar fees pursuant to agreements under which BioTime or its subsidiary has no continuing performance obligations, the fees are recognized as revenues when collection is reasonably assured. When BioTime or a subsidiary receives up-front nonrefundable licensing or similar fees pursuant to agreements under which BioTime or its subsidiary does have continuing performance obligations, the fees are deferred and amortized ratably over the performance period. If the performance period cannot be reasonably estimated, BioTime amortizes nonrefundable fees over the life of the contract until such time that the performance period can be more reasonably estimated. Milestone payments, if any, related to scientific or technical achievements, subject to substantial uncertainty, are recognized in income when the milestone is accomplished if (a) substantive effort was required to achieve the milestone, (b) the amount of the milestone payment appears reasonably commensurate with the effort expended, and (c) collection of the payment is reasonably assured.

*Cash and cash equivalents* – BioTime considers all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents. As of December 31, 2016 and 2015, BioTime had $16.8 million and $35.5 million in money market funds, respectively, considered to be cash equivalents.

*Restricted cash* – BioTime has a certificate deposit in the amount of $847,000 included in deposits and other long-term assets as of December 31, 2016, as required under the Alameda Lease discussed in Note 11, as BioTime is restricted from using the cash for working capital purposes.

*Trade accounts and grants receivable, net* – Net trade receivables amounted to $344,000 and $754,000 and grants receivable amounted to $102,000 and $324,000 as of December 31, 2016 and 2015, respectively. Net trade receivables include allowance for doubtful accounts of approximately $543,000 as of December 31, 2016 for those amounts deemed uncollectible by BioTime. BioTime evaluates the collectability of its receivables based on a variety of factors, including the length of time receivables are past due and significant one-time events and historical experience. An additional reserve for individual accounts will be recorded if BioTime becomes aware of a customer's inability to meet its financial obligations, such as in the case of bankruptcy filings or deterioration in the customer's operating results or financial position. If circumstances related to customers change, estimates of the recoverability of receivables would be further adjusted.

*Concentrations of credit risk* – Financial instruments that potentially subject BioTime to significant concentrations of credit risk consist primarily of cash and cash equivalents. BioTime limits the amount of credit exposure of cash balances by maintaining its accounts in high credit quality financial institutions. Cash equivalent deposits with financial institutions may occasionally exceed the limits of insurance on bank deposits; however, BioTime has not experienced any losses on such accounts.

*Fair Value Measurements* – Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. To increase the comparability of fair value measures, the following hierarchy prioritizes the inputs to valuation methodologies used to measure fair value (ASC 820-10-50), *Fair Value Measurements and Disclosures* :

- Level 1 – Inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 – Inputs to the valuation methodology include quoted prices for similar assets or liabilities in active markets, and inputs that are observable for the assets or liability, either directly or indirectly, for substantially the full term of the financial instruments.
- Level 3 – Inputs to the valuation methodology are unobservable; that reflect management's own assumptions about the assumptions market participants would make and significant to the fair value.

In determining fair value, BioTime utilizes valuation techniques that maximize the use of observable inputs and minimize the use of unobservable inputs to the extent possible, and also considers counterparty credit risk in its assessment of fair value. For the periods presented, BioTime has no financial assets or liabilities recorded at fair value on a recurring basis, except for cash and cash equivalents consisting of money market funds, shares BioTime holds in Asterias and the available-for-sale securities described below. These assets are measured at fair value using the applicable period-end quoted market prices as a Level 1 input.

The fair value of BioTime's assets and liabilities, which qualify as financial instruments under FASB guidance regarding disclosures about fair value of financial instruments, approximate the carrying amounts presented in the accompanying consolidated balance sheets. The carrying amounts of accounts receivable, prepaid expenses and other current assets, accounts payable, accrued expenses and other current liabilities approximate fair values because of the short-term nature of these items.

*Equity method accounting for Asterias, at fair value* – BioTime uses the equity method of accounting when it has the ability to exercise significant influence, but not control, as determined in accordance with GAAP, over the operating and financial policies of a company. For equity method investments, which BioTime has elected to measure at fair value, unrealized gains and losses are reported in the consolidated statements of operations as a non-operating gain or loss from equity method investments.

As further discussed in Note 4, effective May 13, 2016, BioTime owned approximately 49% of the outstanding common stock of Asterias and has elected to account for its Asterias shares at fair value using the equity method of accounting because since that date BioTime has not had control of Asterias, as defined by GAAP, but continues to exercise significant influence over Asterias. Under the fair value method, BioTime's Asterias shares are marked to market using the closing price of Asterias common stock on the NYSE MKT multiplied by the number of shares of Asterias held by BioTime, with changes in the fair value of the Asterias shares included in other income/expenses, net, in the condensed consolidated statements of operations. The Asterias shares are considered a Level 1 asset as defined by ASC 820.

*Available for sale securities in foreign investments* – BioTime accounts for the shares it holds as available-for-sale foreign equity securities in accordance with ASC 320-10-25, *Investments – Debt and Equity Securities*, as the shares have a readily determinable fair value quoted on the Tel Aviv Stock Exchange, or TASE, (under trading symbol "HDST"). These securities are held principally as available for sale to meet future working capital needs and are denominated in New Israeli Shekels (NIS). The securities are measured at fair value and reported as current assets on the balance sheet based on the closing trading price of the security as of the date being presented. Unrealized holding gains and losses, including changes in foreign currency exchange rates, net of tax, are reported in other comprehensive income or loss. Realized gains and losses, and declines in value judged to be other-than-temporary related to equity securities, are included in other income or expenses, net, in the consolidated statements of operations.

*Property, plant and equipment, net* – Property, plant and equipment is stated at cost and is being depreciated using the straight-line method over their estimated useful lives ranging from 3 to 10 years. Leasehold improvements are amortized over the shorter of the useful life or the lease term.

*Long-lived intangible assets* – Long-lived intangible assets, consisting primarily of acquired patents, patent applications, and licenses to use certain patents are stated at acquired cost, less accumulated amortization. Amortization expense is computed using the straight-line method over the estimated useful lives of the assets, generally over 10 years.

*Impairment of long-lived assets* – Long-lived assets, including long-lived intangible assets, are reviewed annually for impairment and whenever events or changes in circumstances indicate that the carrying amount of an asset may not be fully recoverable. If an impairment indicator is present, BioTime evaluates recoverability by a comparison of the carrying amount of the assets to future undiscounted net cash flows expected to be generated by the assets. If the assets are impaired, the impairment recognized is measured by the amount by which the carrying amount exceeds the estimated fair value of the assets.

*Treasury stock* – BioTime accounts for BioTime common shares issued to subsidiaries for future potential working capital needs as treasury stock on the consolidated balance sheet. BioTime has registered the BioTime common shares held by its subsidiaries for sale under the Securities Act of 1933, as amended (the "Securities Act") to enhance the marketability of the shares.

*Accounting for warrants* – BioTime determines the accounting classification of warrants that it or its subsidiaries issue, as either liability or equity, by first assessing whether the warrants meet liability classification in accordance with ASC 480-10, *Accounting for Certain Financial Instruments with Characteristics of both Liabilities and Equity*, and then in accordance with ASC 815-40, *Accounting for Derivative Financial Instruments Indexed to, and Potentially Settled in, a Company's Own Stock*. Under ASC 480, warrants are considered liability classified if the warrants are mandatorily redeemable, obligate the issuer to settle the warrants or the underlying shares by paying cash or other assets, or warrants that must or may require settlement by issuing variable number of shares. If warrants do not meet liability classification under ASC 480-10, BioTime assesses the requirements under ASC 815-40, which states that contracts that require or may require the issuer to settle the contract for cash are liabilities recorded at fair value, irrespective of the likelihood of the transaction occurring that triggers the net cash settlement feature. If the warrants do not require liability classification under ASC 815-40, in order to conclude equity classification, BioTime assesses whether the warrants are indexed to its common stock or its subsidiary's common stock, as applicable, and whether the warrants are classified as equity under ASC 815-40 or other applicable GAAP. After all relevant assessments are made, BioTime concludes whether the warrants are classified as liability or equity. Liability classified warrants are required to be accounted for at fair value both on the date of issuance and on subsequent accounting period ending dates, with all changes in fair value after the issuance date recorded in the consolidated statements of operations as a gain or loss. Equity classified warrants are accounted for at fair value on the issuance date with no changes in fair value recognized subsequent to the issuance date. BioTime does not have any liability classified warrants as of any period presented (see Note 9).

*Investments in Common Stock of Privately Held Companies* – BioTime evaluates whether investments held in common stock of an investee require consolidation of the entity under, first, the variable interest entity ("VIE") model, and then under the Voting Interest model in accordance with accounting guidance for consolidations under Accounting Standards Codification ("ASC") 810-10. If consolidation of the entity is not required under either the VIE model or the Voting Interest model, BioTime determines whether the equity method of accounting should be applied in accordance with ASC 323, *Investments – Equity Method and Joint Ventures*. The equity method applies to investments in common stock or in-substance common stock if BioTime exercises significant influence over, but does not control, the entity, typically represented by ownership of 20% or more of the voting interests of an entity.

BioTime initially records equity method investments at fair value on the date of the acquisition with subsequent adjustments to the investment balance based on BioTime's share of earnings or losses from the investment included in other income or expenses, net, on the consolidated statements of operations. The equity method investment balance is shown in noncurrent assets on the consolidated balance sheets.

BioTime reviews investments accounted for under the equity method for impairment whenever events or changes in circumstances indicate that the carrying amount of the investment may not be fully recoverable. If a determination is made that an “other-than-temporary” impairment exists, BioTime writes down its investment to fair value. Based on an evaluation and continuing losses and negative cash flows generated from the Ascendance investment, including uncertainty as to Ascendance’s ability to raise sufficient financing, BioTime determined that an other-than-temporary impairment existed on its equity method investment in Ascendance as of December 31, 2016, and BioTime wrote down the entire remaining $3.5 million carrying value of that investment included in other income and expenses, net.

*Cost of sales* – BioTime accounts for the cost of research products acquired for sale and any royalties paid as a result of any revenues in accordance with the terms of the applicable licensing agreements as cost of sales on the consolidated statement of operations.

*Reclassifications* – Certain immaterial reclassifications have been made to the year ended December 31, 2015 consolidated statements of changes in shareholders’ equity to conform to the December 31, 2016 presentation. These reclassifications had no impact on the consolidated statements of operations, cash flows or consolidated shareholders’ equity for any year presented.

*Research and development* – Research and development expenses consist of costs incurred for company-sponsored, collaborative and contracted research and development activities. These costs include direct and research-related overhead expenses including salaries, payroll taxes, consulting fees, research and laboratory fees, rent of research facilities, amortization of intangible assets, costs of patent applications, prosecution, and maintenance, and license fees paid to third parties to acquire patents or licenses to use patents and other technology. BioTime expenses research and development costs as such costs are incurred. Research and development expenses incurred and reimbursed by grants from third parties approximate the grant income recognized in the consolidated statements of operations.

*General and administrative* – General and administrative expenses consist of compensation and related benefits, including stock-based compensation, for executive and corporate personnel; professional and consulting fees; and allocated overhead.

*Foreign currency translation and other comprehensive loss, foreign currency transaction gains and losses* – In countries in which BioTime operates, where the functional currency is other than the U.S. dollar, assets and liabilities are translated using published exchange rates in effect at the consolidated balance sheet date. Revenues and expenses and cash flows are translated using an approximate weighted average exchange rate for the period. Resulting translation adjustments are recorded as a component of accumulated other comprehensive income or loss on the consolidated balance sheet. For the years ended December 31, 2016, 2015 and 2014, comprehensive income (loss) includes foreign currency translation adjustments, net of tax, of ($106,000), ($424,000) and $125,000, respectively.

For transactions denominated in other than the functional currency of BioTime, transactional gains and losses are recorded in other income and expense, net, included in the consolidated statements of operations. Foreign currency transaction gains and losses were not material for all periods presented.

*Income taxes* – BioTime accounts for income taxes in accordance with ASC 740, *Income Taxes*, which prescribe the use of the asset and liability method, whereby deferred tax asset or liability account balances are calculated at the balance sheet date using current tax laws and rates in effect. Valuation allowances are established when necessary to reduce deferred tax assets when it is more likely than not that a portion or all of the deferred tax assets will not be realized. ASC 740 guidance also prescribes a recognition threshold and a measurement attribute for the financial statement recognition and measurement of tax positions taken or expected to be taken in a tax return. For benefits to be recognized, a tax position must be more-likely-than-not sustainable upon examination by taxing authorities. BioTime files a U.S. federal income tax return as well as various state and foreign income tax returns. BioTime’s judgments regarding future taxable income may change over time due to changes in market conditions, changes in tax laws, tax planning strategies or other factors. Certain majority-owned subsidiaries that BioTime consolidates under GAAP file their own, standalone federal income tax returns as those subsidiaries are not considered consolidated under federal income tax regulations, and accordingly, BioTime and those subsidiaries may not use each other’s tax attributes. If BioTime assumptions, and consequently the estimates, change in the future with respect to BioTime’s own deferred tax assets and liabilities, the valuation allowance may be increased or decreased, which may have a material impact on BioTime’s consolidated financial statements.

For California, Asterias’ activities were included in BioTime’s combined tax return through May 12, 2016. Beginning May 13, 2016, Asterias will file its own separate California income tax return (see Note 3) BioTime recognizes accrued interest and penalties related to unrecognized tax benefits, if any, as income tax expense, however, no amounts were accrued for the payment of interest and penalties as of December 31, 2016 and 2015. In general, BioTime is no longer subject to tax examination by major taxing authorities for years before 2012. Although the statute is closed for purposes of assessing additional income and tax in those years, the taxing authorities may still make adjustments to the net operating loss and credit carryforwards used in open years. Therefore, the statute should be considered open as it relates to the net operating loss and credit carryforwards. Any potential examinations may include questioning the timing and amount of deductions, the nexus of income among various tax jurisdictions and compliance with U.S. federal, state and local and foreign tax laws. Management does not expect that the total amount of unrecognized tax benefits will materially change over the next year.

As further discussed in Note 12, BioTime adopted early the provisions of Accounting Standards Update, ASU 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, on a retrospective basis and due to the full valuation allowance on its deferred tax assets for all periods presented. The adoption did not have any impact on the consolidated financial statements.

*Stock-based compensation* – BioTime follows accounting standards governing share-based payments, which require the measurement and recognition of compensation expense for all share-based payment awards made to directors and employees, including employee stock options, based on estimated fair values less estimated forfeitures. Consistent with FASB guidelines, BioTime utilizes the Black-Scholes-Merton option pricing model for valuing share-based payment awards. BioTime's determination of fair value of share-based payment awards on the date of grant using that option-pricing model is affected by BioTime's stock price as well as by assumptions regarding a number of complex and subjective variables. These variables include, but are not limited to, BioTime's expected stock price volatility over the term of the awards; the expected term of options granted, derived from historical data on employee exercises and post-vesting employment termination behavior; and a risk-free interest rate based on the U.S. Treasury rates in effect during the corresponding period of grant.

As further disclosed in Note 10, certain of BioTime's privately-held consolidated subsidiaries have their own share-based compensation plans. For share-based compensation awards granted by those privately-held consolidated subsidiaries under their respective equity plans, BioTime determines the expected stock price volatility using historical prices of comparable public company common stock for a period equal to the expected term of the options. The expected term of privately-held subsidiary options is based upon the "simplified method" provided under *Staff Accounting Bulletin, Topic 14*, or SAB Topic 14. The fair value of the shares of common stock underlying the stock options of the privately-held consolidated subsidiaries is determined by the Board of Directors of those subsidiaries, as applicable, which is also used to determine the exercise prices of the stock options at the time of grant.

Although the fair value of employee stock options is determined in accordance with FASB guidance, changes in the assumptions can materially affect the estimated value and therefore the amount of compensation expense recognized in the consolidated financial statements.

*Net income or loss per share* – BioTime applies the two-class method for calculating basic earnings per share. Under the two-class method, net income, if any, will be reduced by preferred stock dividends and the residual amount is allocated between common stock and other participating securities based on their participation rights. Participating securities included only Series A convertible preferred stock, all of which was converted to common shares during 2015. Basic earnings per share is calculated by dividing net income or loss attributable to BioTime common shareholders by the weighted average number of shares of common stock outstanding, net of unvested restricted stock subject to repurchase by BioTime, if any, during the period. For periods in which BioTime reported a net loss, the participating securities were not contractually obligated to share in the losses of BioTime, and accordingly, no losses have been allocated to the participating securities during applicable periods. Diluted earnings per share is calculated by dividing the net income or loss attributable to BioTime common shareholders by the weighted average number of common shares outstanding, adjusted for the effects of potentially dilutive common stock, which are comprised of stock options and warrants, using the treasury-stock method, Series A convertible preferred stock, using the if-converted method, and shares of BioTime common stock held by subsidiaries.

The primary components of weighted average shares of potentially dilutive common shares used to compute diluted net income per common share for the year ended December 31, 2016, were approximately 2,030,000 BioTime common shares held by Asterias and OncoCyte (see Note 10), and approximately 206,000 restricted stock units and outstanding stock options. Outstanding warrants to purchase 9.4 million BioTime common shares were excluded from potentially dilutive common shares because the exercise price of the warrants exceeded the average closing price of BioTime common shares for the year ended December 31, 2016. For the years ended December 31, 2015 and 2014, because BioTime reported losses attributable to common stockholders, all potentially dilutive common stock is antidilutive for those periods. Diluted net loss per share for year ended December 31, 2015 excludes any effect from 4,472,586 treasury shares, 5,194,313 stock options and 10,109,860 common share purchase warrants outstanding, and for the year ended December 31, 2014 excludes 4,893,942 treasury shares, 3,974,326 stock options and 9,194,679 common share purchase warrants outstanding, because the inclusion would be antidilutive.

*Recently Issued Accounting Pronouncements* – The following accounting standards, which are not yet effective, are presently being evaluated by BioTime to determine the impact that they might have on its consolidated financial statements.

In December 2016, FASB issued Accounting Standards Update, ASU, 2016-20, "Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers" ("ASU 2016-20") which amends narrow aspects of accounting standard ASU 2014-09 "Revenue from Contracts with Customers (Topic 606)." ASU-2016-20 is effective for periods beginning after December 15, 2017.

In May 2014, the FASB issued ASU 2014-09, "Revenue from Contracts with Customers (Topic 606)", which supersedes nearly all existing revenue recognition guidance under GAAP. The core principle of ASU 2014-09 is to recognize revenues when promised goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled for those goods or services. ASU 2014-09 defines a five-step process to achieve this core principle and, in doing so, more judgments and estimates may be required in the revenue recognition process than are required under existing GAAP. The revised revenue standard is effective for public entities for annual periods beginning after December 15, 2017, and interim periods therein, using either of the following transition methods: (i) a full retrospective approach reflecting the application of the standard in each prior reporting period with the option to elect certain practical expedients; or (ii) a retrospective approach with the cumulative effect of initially adopting ASU 2014-09 recognized at the date of adoption (which includes additional footnote disclosures).

BioTime has completed an initial assessment of the new revenue recognition standard under Topic 606, which will be effective for BioTime beginning on January 1, 2018, and BioTime will be working on an implementation plan to evaluate the accounting and disclosure requirements under the new standard. Based on the work performed to date, BioTime does not expect adoption of the new standard to have a material impact on the consolidated financial statements. BioTime has not finalized its transition method for adoption.

In March 2016, the FASB issued ASU 2016-09, "Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting", which simplifies several aspects of the accounting for share-based payment transactions, including the income tax consequences, forfeitures, classification of awards as either equity or liabilities, and classification of awards on the statement of cash flows. The update is effective for fiscal years beginning after December 15, 2016, and interim periods within those annual periods. BioTime is currently evaluating the impact the adoption of ASU 2016-09 will have on its consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, "Leases (Topic 842)", which requires lessees to recognize assets and liabilities for leases with lease terms greater than twelve months in the statement of financial position. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. ASU 2016-02 also requires improved disclosures to help users of financial statements better understand the amount, timing and uncertainty of cash flows arising from leases. The update is effective for fiscal years beginning after December 15, 2018, including interim reporting periods within that reporting period. Early adoption is permitted. BioTime is currently evaluating the impact the adoption of ASU 2016-02 will have on its consolidated financial statements.

**3. Deconsolidation of Asterias**

On May 13, 2016, Asterias completed the sale of 5,147,059 shares of its common stock and warrants to purchase 2,959,559 shares of its common stock, through an underwritten public offering (the "Asterias Offering"). Asterias received approximately $16.2 million in net proceeds from the Asterias Offering, after deduction of underwriting discounts, commissions and other expenses of the Asterias Offering.

As a result of the sale of Asterias common stock in the Asterias Offering and the issuance of 708,333 shares of Asterias common stock upon the exercise of certain stock options by a former Asterias executive, as of May 13, 2016, BioTime's percentage ownership of the outstanding common stock of Asterias declined to 48.7%. On May 13, 2016, BioTime experienced a loss of control of Asterias under GAAP (see Note 1). Accordingly, BioTime has deconsolidated Asterias financial statements and results of operations from BioTime (the "Asterias Deconsolidation"), effective May 13, 2016, in accordance with ASC, 810-10-40-4(c), *Consolidation*. Beginning on May 13, 2016, BioTime is accounting for the retained non-controlling interest in Asterias under the equity method of accounting and has elected the fair value option under ASC 825-10, *Financial Instruments*.

In connection with the Asterias Deconsolidation and in accordance with ASC 810-10-40-5, BioTime recorded a gain on deconsolidation of $49.0 million during the year December 31, 2016 included in other income and expenses, net, in the consolidated statements of operations.

BioTime held 21.7 million shares of Asterias common stock, or approximately 46% of Asterias outstanding common stock as of December 31, 2016.

**4. Equity Method of Accounting for Common Stock of Asterias, at fair value**

BioTime elected to account for its 21.7 million shares of Asterias common stock at fair value using the equity method of accounting beginning on May 13, 2016, the date of the Asterias Deconsolidation. The Asterias shares had a fair value of $100.0 million as of December 31, 2016 and a fair value of $65.7 million as of May 13, 2016, based on the closing price of Asterias common stock on the NYSE MKT on those respective dates. For the year ended December 31, 2016, BioTime recorded unrealized gains of $34.3 million on the Asterias shares due to the increase in Asterias stock price from May 13, 2016 to December 31, 2016.

The condensed results of operations and condensed balance sheet information of Asterias are summarized below (in thousands):

| | For the Year Ended December 31, 2016 [1] |
|---|---|
| *Condensed Statements of Operations* [1]*:* | |
| Total revenue | $ 6,954 |
| Gross profit | 6,826 |
| Loss from operations | (34,123) |
| Net loss | $(35,038) |

| | December 31, 2016 | December 31, 2015 |
|---|---|---|
| *Condensed Balance Sheet information*[2]*:* | | |
| Current assets | $36,990 | $29,789 |
| Noncurrent assets | 24,020 | 27,445 |
| | $61,010 | $57,234 |
| | | |
| Current liabilities | $6,051 | $ 4,980 |
| Noncurrent liabilities | 12,930 | 7,155 |
| Stockholders' equity | 42,029 | 45,099 |
| | $61,010 | $57,234 |

(1) Asterias results of operations for the period from January 1, 2016 through May 12, 2016, the date immediately preceding the Asterias Deconsolidation, are included in the consolidated results of operations of BioTime for the year ended December 31, 2016 shown in the table below.

(2) The condensed balance sheet information of Asterias as of December 31, 2016, provided for informational and comparative purposes only, was not included in BioTime's consolidated balance sheet at December 31, 2016 due to the Asterias Deconsolidation on May 13, 2016. The condensed balance sheet information of Asterias as of December 31, 2015, included in the table above, was included in BioTime's consolidated balance sheet at December 31, 2015, after intercompany eliminations.

The following table summarizes Asterias results of operations that are included in BioTime's consolidated results of operations, after intercompany eliminations, for the period from January 1, 2016 through May 12, 2016, the date immediately preceding the Asterias Deconsolidation, and for the years ended December 31, 2015 and 2014 (in thousands).

| | **For the Period January 1, 2016 through May 12, 2016** | **Year Ended December 31, 2015** | **Year Ended December 31, 2014** |
|---|---|---|---|
| Total revenue | $ 2,354 | $ 3,582 | $ 1,224 |
| Gross profit | 2,301 | 3,314 | 1,129 |
| Loss from operations | (13,944) | (21,908) | (17,461) |
| Net loss | $(13,113) | $(15,003) | $(10,097) |

**5. Property, plant and equipment, net**

At December 31, 2016 and 2015, property, plant and equipment were comprised of the following (in thousands):

| | **December 31,** | |
|---|---|---|
| | **2016(1)** | **2015** |
| Equipment, furniture and fixtures | $4,718 | $5,274 |
| Leasehold improvements | 3,791 | 5,623 |
| Construction in progress | - | 93 |
| Accumulated depreciation and amortization | (2,980) | (3,451) |
| Property and equipment, net | $5,529 | $7,539 |

(1) Reflects the effect of the Asterias Deconsolidation.

Property, plant and equipment at December 31, 2016 include $626,000 and $33,800 financed by capital lease borrowings in 2016 and 2015, respectively. Depreciation and amortization expense amounted to $1.2 million, 1.1 million and $1.1 million for the years ended December 31, 2016, 2015 and 2014, respectively.

*Leasehold improvements*

Leasehold improvements of approximately $1.6 million was transferred to property, plant and equipment as of June 1, 2016 when BioTime completed construction of leasehold improvements at its new Alameda facility (see Note 5). Under the terms of the lease agreement, the landlord provided BioTime with an initial tenant improvement allowance of up to $1.4 million, which BioTime utilized entirely to construct a research and development laboratory, a diagnostic testing laboratory, and a small production facility that can be used to manufacture small cell banks and clinical materials for clinical studies. Additional leasehold improvements of approximately $200,000 paid by BioTime were not reimbursable by the landlord. The tenant improvements will be amortized over the shorter of the useful life of the assets or the lease term.

**6. Intangible assets, net**

At December 31, 2016 and 2015, intangible assets, primarily consisting of acquired patents and accumulated amortization were as follows (in thousands):

| | December 31, | |
|---|---|---|
| | 2016[1] | 2015 |
| Intangible assets | $ 25,703 | $ 52,563 |
| Accumulated amortization | (15,497) | (18,971) |
| Intangible assets, net | $ 10,206 | $ 33,592 |

(1) Reflects the effect of the Asterias Deconsolidation.

BioTime amortizes its intangible assets over an estimated period of 10 years on a straight-line basis. BioTime recognized $3.6 million, $5.3 million and $7.4 million in amortization expense of intangible assets during the years ended December 31, 2016, 2015 and 2014, respectively.

Amortization of intangible assets for periods subsequent to December 31, 2016 is as follows (in thousands):

| Year Ended December 31, | Amortization Expense |
|---|---|
| 2017 | $ 2,570 |
| 2018 | 2,570 |
| 2019 | 2,571 |
| 2020 | 1,794 |
| 2021 | 537 |
| Thereafter | 164 |
| Total | $10,206 |

**7. Accounts Payable and Accrued Liabilities**

At December 31, 2016 and 2015, accounts payable and accrued liabilities consist of the following (in thousands):

| | December 31, | |
|---|---|---|
| | 2016[1] | 2015 |
| Accounts payable | $ 1,593 | $ 2,798 |
| Accrued expenses | 3,212 | 5,021 |
| Accrued payroll and bonus | 1,904 | 1,126 |
| Other current liabilities | 435 | 432 |
| Total | $ 7,144 | $ 9,377 |

(1) Reflects the effect of the Asterias Deconsolidation.

## 8. Related Party Transactions

BioTime currently pays $5,050 per month for the use of approximately 900 square feet of office space in New York City, which is made available to BioTime on a month-by-month basis by one of its directors at an amount that approximates his cost.

During the year ended December 31, 2016, Cell Cure issued certain convertible promissory notes (the "Convertible Debt") to a Cell Cure shareholder other than BioTime in the principal amount of $1,757,000. In April and November 2015, Cell Cure issued Convertible Debt to a Cell Cure shareholder other than BioTime in the principal amount of $188,000 and $66,000, respectively. In July and September 2014, Cell Cure issued Convertible Debt to two Cell Cure shareholders other than BioTime in the principal amount of $471,000. One of the Cell Cure shareholders who acquired Convertible Debt is considered a related party. The functional currency of Cell Cure is the Israeli New Shekel however the Convertible Debt is payable in United States dollars. The Convertible Debt bears a stated interest rate of 3% per annum. The total outstanding principal balance of the Convertible Debt, with accrued interest, is due and payable on various maturity dates in July and September 2017, and in February and April 2019. The outstanding principal balance of the Convertible Debt with accrued interest is convertible into Cell Cure ordinary shares at a fixed conversion price of $20.00 per share, at the election of the holder, at any time prior to maturity. Any conversion of the Convertible Debt must be settled with Cell Cure ordinary shares and not with cash. The conversion feature of the Convertible Debt issued is not accounted for as an embedded derivative under the provisions of ASC 815, *Derivatives and Hedging* since it is not a freestanding financial instrument and the underlying Cell Cure ordinary shares are not readily convertible into cash. Accordingly, the Convertible Debt is accounted for under ASC 470-20, *Debt with Conversion and Other Options* (ASC 470-20). Under ASC 470-20, BioTime determined that a beneficial conversion feature ("BCF") was present on the issuance dates of the Convertible Debt. A conversion feature is beneficial if, on the issuance dates, the effective conversion price is less than the fair value of the issuer's capital stock. Since the effective conversion price of $20.00 per share is less than the estimated range of fair values from $28.00 per share to $40.00 per share of Cell Cure ordinary shares on the dates the Convertible Debt was issued, a beneficial conversion feature, equal to the intrinsic value ranging from $8 per share to $20 per share, is present. In accordance with ASC 470-20-30-8, if the intrinsic value of the BCF is greater than the proceeds allocated to the convertible instrument, the amount of the discount assigned to the BCF is limited to the amount of the proceeds allocated to the convertible instrument. The BCF is recorded as an addition to equity with a corresponding debt discount on the Convertible Debt issuance date. This debt discount will be amortized to interest expense using the effective interest method over the three-year term of the debt, representing an approximate effective annual interest rate between 11% and 23%.

At December 31, 2016, the carrying value of the Convertible Debt was $1,865,000, comprised of principal and accrued interest of $2,544,000, net of unamortized debt discount of $679,000. As of December 31, 2015, the carrying value of the Convertible Debt was $324,000, comprised of principal and accrued interest of $748,000, net of unamortized debt discount of $424,000.

At December 31, 2016, total accounts receivable from affiliates from shared services amounted to $511,000.

In January 2016 and May 2016, certain BioTime board members invested in Ascendance as individual investors in Ascendance (see Note 2).

## 9. Shareholders' Equity

*Preferred Shares*

BioTime is authorized to issue 2,000,000 shares of preferred stock. The preferred shares may be issued in one or more series as the board of directors may by resolution determine. The board of directors is authorized to fix the number of shares of any series of preferred shares and to determine or alter the rights, preferences, privileges, and restrictions granted to or imposed on the preferred shares as a class, or upon any wholly unissued series of any preferred shares. The 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 shares subsequent to the issue of shares of that series. As of December 31, 2016, no shares of preferred stock were issued or outstanding.

*Common Shares*

BioTime is authorized to issue 150,000,000 common shares with no par value. As of December 31, 2016, BioTime had 103,396,245 issued and 102,776,539 outstanding common shares. As of December 31, 2015, BioTime had 94,894,140 issued and 90,421,554 outstanding common shares. The difference of 619,706 and 4,472,586 common shares as of December 31, 2016 and 2015, respectively, is attributed to shares held by BioTime subsidiaries which are accounted for as treasury stock on the consolidated balance sheet.

On June 16, 2016, BioTime sold 7,322,176 common shares in an underwritten public offering at a public offering price of $2.39 per share, for net proceeds of $16.4 million, after deducting underwriting discounts and commissions and other expenses. On July 5, 2016, BioTime issued an additional 1,098,326 common shares upon the full exercise of the over-allotment option by the underwriters for net proceeds of $2.2 million, after deducting underwriting discounts.

On February 15, 2017, BioTime sold 7,453,704, shares of common stock in an underwritten public offering (see Note 16).

Significant common share transactions during the year ended December 31, 2015 are as follows:

- In September 2015, BioTime raised $8.6 million through the sale of 2,607,401 common shares at an offering price of $3.29 to three of its shareholders.
- During October 2015, BioTime sold 6,530,612 common shares for $20.4 million in the aggregate to certain investment funds in Israel that hold shares of companies that are included within certain stock indexes of the TASE. The $3.13 purchase price per share was determined with reference to the closing price of BioTime common shares on the TASE on the date of sale. In addition, OncoCyte sold 246,356 BioTime common shares at the same price to one of the Israeli investment funds.
- In October 2015, BioTime sold 1,600,000 common shares to a shareholder for $5.1 million. The $3.19 price of price per share was the closing price of the common shares on the NYSE MKT on October 1, 2015, the last trading day before BioTime and the shareholder entered into a purchase agreement for the sale of the shares.
- On December 31, 2015, BioTime distributed 4.7 million shares of OncoCyte common stock to its shareholders, on a pro rata basis, accounted for as a dividend in kind. On this date, BioTime shareholders received one share of OncoCyte common stock for every twenty shares of BioTime common stock held. As a result of this distribution, BioTime recorded a reduction in the carrying value of its investment in OncoCyte with a corresponding increase to noncontrolling interests in OncoCyte in the amount of $712,000, representing the reduction in BioTime's ownership in OncoCyte by 18.7% from 76.5% to 57.8%. BioTime continues to hold a controlling financial interest in OncoCyte. This distribution generated a taxable gain of approximately $7.4 million to BioTime, however BioTime had sufficient current year losses to offset the entire gain.

See Note 10 for a summary of all option activity under the stock option plans of all subsidiaries for the years ended December 31, 2016 and 2015.

*Treasury Stock*

Certain BioTime subsidiaries hold BioTime common shares that the subsidiaries received from BioTime in exchange for capital stock in the subsidiaries. The BioTime common shares held by subsidiaries are treated as treasury stock by BioTime and BioTime does not recognize a gain or loss on the sale of those shares by its subsidiaries.

As of December 31, 2016, all 619,706 shares of treasury stock were held by OncoCyte. Beginning on February 17, 2017, and in connection with the OncoCyte Deconsolidation, those treasury shares will be considered to be issued and outstanding BioTime common shares.

*BioTime Warrants*

BioTime has issued warrants to purchase its common shares. Activity related to warrants in 2016 and 2015 is presented in the table below (in thousands, except price per share):

| | **Number of Warrant Shares** | **Per Share Exercise Price** | **Weighted Average Exercise Price** |
|---|---|---|---|
| Outstanding, January 1, 2014 | 9,752 | $5.00-10.00 | $5.29 |
| Exercised in 2014 | (557) | 10.00 | 10.00 |
| Outstanding, December 31, 2014 | 9,195 | $ 5.00 | $5.00 |
| Exercised in 2015 | (4) | 5.00 | 5.00 |
| Warrant adjustment(1) | 919 | | |
| Outstanding, December 31, 2015 | 10,110 | $ 4.55 | $4.55 |
| Expired in 2016 | (715) | 4.55 | 4.55 |
| Outstanding, December 31, 2016(2) | 9,395 | $ 4.55 | $4.55 |

(1) The number of shares issuable upon the exercise of the warrants was adjusted as a result of the distribution of OncoCyte common stock to BioTime shareholders during December 2015.

(2) The 9,394,862 outstanding warrants will expire, if unexercised, beginning June 5, 2018 through September 30, 2018.

*Issuance of common stock and warrants by OncoCyte*

On August 29, 2016, OncoCyte sold an aggregate of 3,246,153 immediately separable units, with each unit consisting of one share of OncoCyte common stock and one warrant to purchase one share of OncoCyte common stock (the "OncoCyte Offering Warrants"), at a price of $3.25 per unit (the "OncoCyte Offering") for net proceeds of $9.8 million, after deducting underwriting discounts, commissions and other expenses. The sales were made pursuant to the terms and conditions of certain Purchase Agreements between OncoCyte and the purchasers in the OncoCyte Offering. The purchasers included certain OncoCyte existing shareholders other than BioTime.

The OncoCyte Offering Warrants have an exercise price of $3.25 per OncoCyte share, and may be exercised for five years from October 17, 2016, the date the OncoCyte Warrants became exercisable.

The OncoCyte Offering Warrants may be exercised on a net "cashless exercise" basis, meaning that the value of a portion of the OncoCyte Offering Warrant shares may be used to pay the exercise price (rather than payment in cash), in certain circumstances, including if a resale registration statement is not effective under the Securities Act when and as required by the Purchase Agreements.

Under certain provisions of the OncoCyte Offering Warrants, in the event of a Fundamental Transaction, as defined in the OncoCyte Offering Warrants, OncoCyte will use reasonable best efforts for the acquirer, or any successor entity other than OncoCyte, to assume the OncoCyte Offering Warrants. If the acquirer does not assume the OncoCyte Offering Warrant obligations, then the acquirer shall pay the holders of OncoCyte Offering Warrants an amount equal to the aggregate value equal to the Black Scholes Value, as defined in the OncoCyte Offering Warrants. The payment of the Black Scholes Value shall be made in cash or such other consideration that the acquirer paid to the other OncoCyte shareholders in the Fundamental Transaction.

OncoCyte is not required to net cash settle the OncoCyte Offering Warrants under any circumstance. OncoCyte considered the guidance in ASC 815-40, *Accounting for Derivative Financial Instruments Indexed to, and Potentially Settled in, a Company's Own Stock*, which states that contracts that require or may require the issuer to settle the contract for cash are liabilities recorded at fair value, irrespective of the likelihood of the transaction occurring that triggers the net cash settlement feature. Since solely an acquirer of OncoCyte, and not OncoCyte itself, may be required to net cash settle the OncoCyte Offering Warrants in the event of a Fundamental Transaction, the OncoCyte Offering Warrants are classified as equity.

As more fully discussed in Note 16, on February 17, 2017, certain of OncoCyte investors exercised 625,000 OncoCyte Offering Warrants which caused BioTime's ownership of the outstanding OncoCyte common stock to decline below 50%.

*Transactions with Noncontrolling Interests of Asterias and OncoCyte*

BioTime accounts for a change in ownership interests in its subsidiaries that does not result in a change of control of the subsidiary by BioTime under the provisions of ASC 810-10-45-23, *Consolidation – Other Presentation Matters*. This guidance is applicable when a noncontrolling shareholder invests in a subsidiary's common stock resulting in a decrease in the ownership percentage held by the controlling shareholder in the subsidiary, but not below 50%, with the controlling shareholder retaining "control" of the subsidiary as defined by GAAP. In accordance with this guidance, a change in ownership interest that does not result in a change of control (of the subsidiary) is considered an "equity transaction". When this occurs, although the total net assets of the subsidiary increase by the amount of the investment made by the noncontrolling shareholder, there is a proportional and immediate transfer of carrying value from the noncontrolling shareholder to the controlling shareholder immediately after the investment, based on the respective ownership percentages. The subsidiary financing transactions with noncontrolling interests in Asterias for $18.3 million, and OncoCyte for $4.0 million, reported in the consolidated statements of shareholders' equity for the year ended December 31, 2016, represent this proportional transfer of carrying value to BioTime pertaining to investments in Asterias and OncoCyte common stock made by noncontrolling shareholders in which BioTime's ownership was reduced, but not below 50%. (see Note 16).

**10. Stock Option Plans**

During 2002, BioTime adopted the 2002 Employee Stock Option Plan (the "2002 Plan"), which was amended in 2004, 2007, and 2009 to reserve additional common shares for issuance under options or restricted stock awards granted to eligible persons. The 2002 Plan expired during September 2012 and no additional grants of options or awards of restricted stock may be made under the 2002 Plan.

During December 2012, BioTime's Board of Directors approved the 2012 Equity Incentive Plan (the "2012 Plan"), which was amended during 2015, under which BioTime has reserved 10,000,000 common shares for the grant of stock options or the sale of restricted stock or other equity awards. No options may be granted under the 2012 Plan more than ten years after the date upon which the 2012 Plan was adopted by the Board of Directors, and no options granted under the 2012 Plan may be exercised after the expiration of ten years from the date of grant. Under the 2012 Plan, options to purchase common shares may be granted to employees, directors and certain consultants at prices not less than the fair market value at date of grant, subject to certain limited exceptions for options granted in substitution of other options. Options may be fully exercisable immediately, or may be exercisable according to a schedule or conditions specified by the Board of Directors or the Compensation Committee of the Board of Directors. The 2012 Plan also permits BioTime to award restricted stock for services rendered or to sell common shares to employees subject to vesting provisions under restricted stock agreements that provide for forfeiture of unvested shares upon the occurrence of specified events under a restricted stock award agreement. BioTime may permit employees or consultants, but not officers or directors, who purchase stock under restricted stock purchase agreements, to pay for their shares by delivering a promissory note that is secured by a pledge of their shares.

BioTime may also grant stock appreciation rights ("SARs") and hypothetical units issued with reference to BioTime common shares ("Restricted Stock Units") under the Plan. An SAR is the right to receive, upon exercise, an amount payable in cash or shares or a combination of cash and shares, as determined by the Board of Directors or the Compensation Committee, equal to the number of shares subject to the SAR that is being exercised multiplied by the excess of (a) the fair market value of a BioTime common share on the date the SAR is exercised, over (b) the exercise price specified in the SAR Award agreement.

The terms and conditions of a grant of Restricted Stock Units will be determined by the Board of Directors or Compensation Committee. No shares of stock will be issued at the time a Restricted Stock Unit is granted, and BioTime will not be required to set aside a fund for the payment of any such award. A recipient of Restricted Stock Units will have no voting rights with respect to the Restricted Stock Units. Upon the expiration of the restrictions applicable to a Restricted Stock Unit, BioTime will either issue to the recipient, without charge, one common share per Restricted Stock Unit or cash in an amount equal to the fair market value of one common share.

The following table summarizes consolidated stock-based compensation expense, including equity awards by privately-held consolidated subsidiaries, related to stock options and other equity awards for the years ended December 31, 2016, 2015, and 2014, which was allocated as follows (in thousands):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| Research and Development | $2,608 | $ 3,267 | $1,310 |
| General and Administrative | 5,343 | 7,783 | 3,145 |
| Total stock-based compensation expense | $7,951 | $11,050 | $4,455 |

As of December 31, 2016, total unrecognized compensation costs related to unvested stock options under BioTime's 2002 Plan and 2012 Plan was $6 million, which is expected to be recognized as expense over a weighted average period of approximately 2.81 years.

The weighted-average estimated fair value of stock options granted under BioTime's 2002 Plan and 2012 Plan during the years ended December 31, 2016, 2015 and 2014 was $1.69, $2.13 and $2.78 per share respectively, using the Black-Scholes Merton model with the following weighted-average assumptions:

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| Expected life (in years) | 5.83 | 5.62 | 6.67 |
| Risk-free interest rates | 1.45% | 1.70% | 2.19% |
| Volatility | 61.24% | 65.82% | 83.20% |
| Dividend yield | 0.00% | 0.00% | 0.00% |

*General Option Information*

A summary of all equity award activity under BioTime's 2002 Plan and 2012 Plan for the years ended December 31, 2016, 2015 and 2014 is as follows (in thousands except weighted average exercise price):

| | Shares Available for Grant | Number of Options Outstanding | Number of RSUs Outstanding | Weighted Average Exercise Price |
|---|---|---|---|---|
| January 1, 2014 | 2,315 | 4,567 | - | $2.71 |
| Granted under 2012 Plan | (2,170) | 2,170 | - | 3.54 |
| Exercised | - | (2,060) | - | 0.58 |
| Forfeited/cancelled/expired under 2002 Plan | - | (179) | - | 4.32 |
| Forfeited/cancelled/expired under 2012 Plan | 523 | (524) | - | 3.72 |
| December 31, 2014 | 668 | 3,974 | - | $4.04 |
| Increase in option pool | 6,000 | - | | - |
| Granted under 2012 Plan | (1,650) | 1,650 | - | 3.72 |
| Exercised | - | (156) | - | 4.00 |
| Forfeited/cancelled/expired under 2002 Plan | - | (35) | - | 6.72 |
| Forfeited/cancelled/expired under 2012 Plan | 239 | (239) | - | 3.82 |
| December 31, 2015 | 5,257 | 5,194 | - | $3.93 |
| Granted under 2012 Plan | (2,315) | 2,315 | - | 3.03 |
| RSUs | (200) | - | 100 | - |
| Common stock issued to consultant in lieu of cash | (28) | - | - | - |
| Common stock issued to employee for bonuses in lieu of cash | (135) | - | - | - |
| Forfeited/cancelled/expired under 2002 Plan | - | (236) | - | 5.17 |
| Forfeited/cancelled/expired under 2012 Plan | 315 | (315) | - | 3.77 |
| December 31, 2016 | 2,894 | 6,958 | 100 | $3.60 |

During the year ended December 31, 2016, BioTime issued 81,603 immediately vested common shares in lieu of cash under the 2012 Plan. Those shares are not RSUs but are included in the reduction of approximately 163,000 aggregate shares from the total pool of shares available for grant in the table above. Common shares issued and RSUs granted from the 2012 Plan reduce the shares available for grant by two shares for each common share issued or RSU granted.

Additional information regarding options outstanding under BioTime's 2002 Plan and 2012 Plan as of December 31, 2016 is as follows (in thousands except exercise prices and weighted average exercise price):

| | Options Outstanding | | | Options Exercisable | |
|---|---|---|---|---|---|
| Range of Exercise Prices | Number Outstanding | Weighted Avg. Remaining Contractual Life (years) | Weighted Avg. Exercise Price | Number Exercisable | Weighted Avg. Exercise Price |
| 2.52-3.96 | 5,349 | 7.21 | $3.32 | 2,080 | $3.46 |
| 4.02-4.95 | 1,429 | 3.80 | $4.25 | 1,225 | $4.26 |
| 5.02-8.58 | 180 | 0.84 | $6.94 | 179 | $6.95 |
| $2.52-8.58 | 6,958 | 6.34 | $3.60 | 3,484 | $3.92 |

*Subsidiary Stock Option Plans*

BioTime's consolidated subsidiaries LifeMap Sciences, LifeMap Solutions, OncoCyte, OrthoCyte, ReCyte Therapeutics, and BioTime Asia have adopted stock option plans that have substantially the same operative provisions (the "Subsidiary Plans"). The LifeMap Sciences stock option plan authorizes the sale of up to 8,000,000 shares of LifeMap Sciences common stock, the LifeMap Solutions stock option plan authorizes the sale of up to 18,667 shares of LifeMap Solutions common stock, the OncoCyte stock option plan authorizes the sale of up to 4,000,000 shares of OncoCyte common stock, the BioTime Asia stock option plan authorizes the sale of up to 1,600 BioTime Asia ordinary shares, and the OrthoCyte and ReCyte Therapeutics stock option plans each authorize the sale of up to 4,000,000 shares of the applicable subsidiary's common stock, through the exercise of stock options or under restricted stock purchase agreements. Cell Cure also has a stock option plan that authorizes the sale of 125,363 ordinary shares through the exercise of stock options.

No options may be granted under a Subsidiary Plan more than ten years after the date upon which the Subsidiary Plan was adopted by the subsidiary's Board of Directors, and no options granted under a Subsidiary Plan may be exercised after the expiration of ten years from the date of grant. Under a Subsidiary Plan, options to purchase common stock may be granted to employees, directors and certain consultants at exercise prices not less than the fair market value of the common stock as of the date of grant, subject to certain limited exceptions for options granted in substitution of other options. Options may be fully exercisable immediately, or may be exercisable according to a schedule or conditions specified by the subsidiary's Board of Directors or its Compensation Committee. Generally, subsidiary stock options have service related vesting conditions based on the continued performance of services for the subsidiary. The Subsidiary Plans also permit the subsidiaries to award restricted stock for services rendered or to sell common stock to employees subject to vesting provisions under restricted stock agreements that provide for forfeiture of unvested shares upon the occurrence of specified events. A subsidiary may permit employees or consultants, but not officers or directors, who purchase stock under restricted stock purchase agreements, to pay for their shares by delivering a promissory note that is secured by a pledge of their shares. As of December 31, 2016, only stock options have been issued under the Subsidiary Plans.

A summary of OncoCyte's Stock Option Plan activity follows (in thousands except weighted average exercise price):

| | Shares Available for Grant | Number of Options Outstanding | Weighted Average Exercise Price |
|---|---|---|---|
| January 1, 2014 | 1,250 | 2,750 | $0.76 |
| Options forfeited/cancelled | 28 | (28) | 1.00 |
| December 31, 2014 | 1,278 | 2,722 | $0.76 |
| Increase in option pool | 4,000 | - | - |
| Options granted | (2,875) | 2,875 | 1.10 |
| Options exercised | - | (6) | 0.67 |
| Options forfeited/cancelled | 1,121 | (1,121) | 0.79 |
| 2 for 1 reverse stock split | (1,762) | (2,235) | 2.02 |
| Options granted after reverse stock split | (10) | 10 | 3.60 |
| Options forfeited/cancelled after reverse stock split | 5 | (5) | 2.00 |
| December 31, 2015 | 1,757 | 2,240 | $2.94 |
| Options granted | (962) | 962 | 3.58 |
| Options exercised | - | (100) | 2.19 |
| Options forfeited/cancelled | 35 | (35) | 2.03 |
| Options expired | 50 | (50) | 2.00 |
| December 31, 2016 | 880 | 3,017 | $2.52 |

A summary of OrthoCyte's Stock Option Plan activity follows (in thousands except weighted average exercise price):

| | Shares Available for Grant | Number of Options Outstanding | Weighted Average Exercise Price |
|---|---|---|---|
| December 31, 2014[(1)] | 1,355 | 2,645 | $0.08 |
| Options forfeited/cancelled | 16 | (16) | 0.07 |
| December 31, 2015 | 1,371 | 2,629 | $0.08 |
| Options forfeited/cancelled | 1,329 | (1,329) | 0.10 |
| December 31, 2016 | 2,700 | 1,300 | $0.06 |

(1) There was no grant activity during 2014.

A summary of ReCyte's Stock Option Plan activity follows (in thousands except weighted average exercise price):

| | Shares Available for Grant | Number of Options Outstanding | Weighted Average Exercise Price |
|---|---|---|---|
| December 31, 2014[(1)] | 2,710 | 1,290 | $2.05 |
| Options forfeited/cancelled | 11 | (11) | 2.05 |
| December 31, 2015 | 2,721 | 1,279 | $2.05 |
| Options forfeited/cancelled | 29 | (29) | 2.05 |
| December 31, 2016 | 2,750 | 1,250 | $2.05 |

(1) There was no grant activity during 2014.

A summary of LifeMap Sciences' Equity Incentive Plan activity follows (in thousands except weighted average exercise price):

| | Shares Available for Grant | Number of Options Outstanding | Weighted Average Exercise Price |
|---|---|---|---|
| January 1, 2014 | 413 | 1,929 | $1.49 |
| Options forfeited/cancelled | 58 | (58) | 1.48 |
| December 31, 2014 | 471 | 1,871 | $1.48 |
| Options granted | (131) | 131 | 1.92 |
| Options forfeited/cancelled | 207 | (207) | 1.79 |
| December 31, 2015 | 547 | 1,795 | $1.47 |
| Options granted | (20) | 20 | 2.25 |
| Options forfeited/cancelled | 219 | (219) | 1.72 |
| December 31, 2016 | 746 | 1,596 | $1.44 |

A summary of LifeMap Solutions' Equity Incentive Plan activity follows (in thousands except weighted average exercise price):

| | Options Available for Grant | Number of Options Outstanding | Weighted Average Exercise Price |
|---|---|---|---|
| Option pool added upon incorporation | 19 | - | $ 0.00 |
| Options granted | (13) | 13 | 500.00 |
| December 31, 2014 | 6 | 13 | $500.00 |
| Options granted | (2) | 2 | 500.00 |
| Options forfeited/cancelled | 1 | (1) | 500.00 |
| December 31, 2015 | 5 | 14 | $500.00 |
| Options granted | (2) | 2 | 500.00 |
| Options forfeited/cancelled | 4 | (4) | 500.00 |
| December 31, 2016 | 7 | 12 | $500.00 |

A summary of Cell Cure's 2007 Employee Share Ownership and Option Plan and 2016 Share Option Plan activity follows (in thousands except weighted average exercise price):

| | Options Available for Grant | Number of Options Outstanding | Weighted Average Exercise Price[(2)] |
|---|---|---|---|
| December 31, 2015[(1)] | 2 | 12 | $23.93 |
| Increase to option under 2016 Share Option Plan | 111 | - | - |
| Options granted | (69) | 69 | 40.00 |
| December 31, 2016 | 44 | 81 | $38.00 |

(1) There was no grant activity during 2014 and 2015.

(2) Cell Cure Neurosciences Share Option Plan US dollar exercise price shown is approximated based on the conversion rate between the US dollar and the New Israeli Shekel, NIS, at the time of grant. The exercise price is denominated in NIS.

BioTime Asia had 1,300 stock options available for future grants and 300 stock options outstanding, with a weighted average exercise price of $0.01 per share as of December 31, 2016.

**11. Commitments and Contingencies**

*Alameda Lease*

On December 10, 2015, BioTime entered into a lease for approximately 30,795 square feet of rentable space in two buildings located in an office park in Alameda, California (the "New Alameda Lease"). The term of the New Alameda Lease is seven years and BioTime has an option to renew the term for an additional five years. BioTime moved into the facility and the term of the New Alameda Lease commenced effective February 1, 2016.

The landlord provided BioTime with an initial tenant improvement allowance of $1.4 million that was applied to the construction of improvements of the leased premises, primarily for the research and development facilities. BioTime utilized the tenant improvement allowance to complete the leasehold improvements as of June 1, 2016 (see Note 5). The lease liability payments are included in the base rent payments to the landlord and the $1.4 million due to the landlord as of December 31, 2016, will be amortized using the effective interest method over the lease term.

Base rent under the New Alameda Lease commenced on February 1, 2016 at $64,670 per month, and will increase by approximately 3% annually on every February 1 thereafter during the lease term. The lease payments allocated to the landlord liability are amortized as debt service on that liability over the lease term.

Total base lease payments, inclusive of the lease liability, under the New Alameda Lease per the lease agreement for the years ending after December 31, 2016 are shown below (in thousands):

| Years Ending December 31, | Minimum Lease Payments |
|---|---|
| 2017 | $ 797 |
| 2018 | 822 |
| 2019 | 844 |
| 2020 | 870 |
| 2021 | 896 |
| Thereafter | 1,002 |
| Total | $5,231 |

In addition to base rent, BioTime will pay a pro rata portion of increases in certain expenses, including real property taxes, utilities (to the extent not separately metered to the leased space) and the landlord's operating expenses, over the amounts of those expenses incurred by the landlord during 2017. As security for the performance of its obligations under the New Alameda Lease, BioTime provided the landlord with an initial security deposit of approximately $847,000, which will be reduced by $423,000 after the first twenty-four months of the lease term, and further reduced by an additional $346,000 after the first thirty-six months of the lease term, by applying those amounts to future rent payment obligations under the lease, if BioTime is not in default under the Lease.

BioTime also currently pays $5,050 per month for the use of office space in New York City, which is made available to BioTime by one of its directors at his cost for use in conducting meetings and other business affairs.

*Cell Cure Lease*

Cell Cure has leased approximately 1,128 square meters of office and laboratory space in Jerusalem, Israel under a lease that expires between May 30, 2019 and December 31, 2020, with two additional options to extend the lease for 5 years each. Base monthly rent is approximately NIS 55,218 (approximately US $14,400 per month). In addition to base rent, Cell Cure pays a pro rata share of real property taxes and certain costs related to the operation and maintenance of the building in which the leased premises are located.

Rent expense totaled $1.5 million, $2.1 million, and $2.0 million for the years ended December 31, 2016, 2015, and 2014, respectively, included in the consolidated statements of operations.

Future minimum annual lease payments under the various operating leases, including the New Alameda Lease noted above, and capital leases, for the years ending after December 31, 2016 are as follows (in thousands):

| Year Ending December 31, | Minimum lease payments(1) | Capital lease payments |
|---|---|---|
| 2017 | $1,098 | $202 |
| 2018 | 1,045 | 217 |
| 2019 | 1,042 | 93 |
| 2020 | 1,048 | - |
| 2021 | 897 | - |
| Thereafter | 1,002 | - |
| Total | $6,132 | $512 |

(1) Includes the lease of our principal office and laboratory facilities in Alameda, California, including the lease liability, leases of the offices and laboratory facilities of LifeMap Sciences, Cell Cure and other operating leases of lab equipment.

*Litigation – General*

BioTime will be subject to various claims and contingencies in the ordinary course of its business, including those related to litigation, business transactions, employee-related matters, and others. When BioTime is aware of a claim or potential claim, it assesses the likelihood of any loss or exposure. If it is probable that a loss will result and the amount of the loss can be reasonably estimated, BioTime will record a liability for the loss. If the loss is not probable or the amount of the loss cannot be reasonably estimated, BioTime discloses the claim if the likelihood of a potential loss is reasonably possible and the amount involved could be material. BioTime is not aware of any claims likely to have a material adverse effect on its financial condition or results of operations.

*Employment Contracts*

BioTime has entered into employment agreements with certain executive officers. Under the provisions of the agreements, BioTime may be required to incur severance obligations for matters relating to changes in control, as defined in the agreements, and involuntary terminations.

*Indemnification*

In the normal course of business, BioTime may provide indemnifications of varying scope under BioTime's agreements with other companies or consultants, typically BioTime's clinical research organizations, investigators, clinical sites, suppliers and others. Pursuant to these agreements, BioTime will generally agree to indemnify, hold harmless, and reimburse the indemnified parties for losses and expenses suffered or incurred by the indemnified parties arising from claims of third parties in connection with the use or testing of BioTime's products and services. Indemnification provisions could also cover third party infringement claims with respect to patent rights, copyrights, or other intellectual property pertaining to BioTime products and services. The term of these indemnification agreements will generally continue in effect after the termination or expiration of the particular research, development, services, or license agreement to which they relate. The potential future payments BioTime could be required to make under these indemnification agreements will generally not be subject to any specified maximum amount. Historically, BioTime has not been subject to any claims or demands for indemnification. BioTime also maintains various liability insurance policies that limit BioTime's financial exposure. As a result, BioTime believes the fair value of these indemnification agreements is minimal. Accordingly, BioTime has not recorded any liabilities for these agreements as of December 31, 2016 and 2015.

*Royalty obligations and license fees*

BioTime and its subsidiaries or affiliates are parties to certain licensing agreements with research institutions, universities and other parties for the rights to use those licenses and other intellectual property in conducting research and development activities. These licensing agreements provide for the payment of royalties by BioTime or the applicable party to the agreement on future product sales, if any. In addition, in order to maintain these licenses and other rights during the product development, BioTime or the applicable party to the contract must comply with various conditions including the payment of patent related costs and annual minimum maintenance fees. Annual minimum maintenance fees are approximately $140,000 to $160,000 per year. The research and development risk for these products is significant. License fees and related expenses under these agreements were $180,000, 282,000 and $432,000 for the years ended December 31, 2016, 2015 and 2014, respectively.

*Grants*

BioTime accounts for grants received to perform research and development services in accordance with ASC 730-20, *Research and Development Arrangements*, which requires an assessment at the inception of the grant whether the grant is a liability or a contract to perform research and development services for others. If the company receiving the grant is obligated to repay the grant funds to the grantor regardless of the outcome of the research and development activities, then the company is required to estimate and recognize that liability. Alternatively, if the company receiving the grant is required to repay the grant funds only if the research and development activities are successful, then the grant agreement is accounted for as a contract to perform research and development services for others. In this case, the grant payments are recognized as income when the related research and development expense is incurred.

Under the terms of the grant agreement between Cell Cure and Israel Innovation Authority, or the IIA (formerly the Office of the Chief Scientist of Israel) of the Ministry of Economy and Industry, for the development of *OpRegen*®, Cell Cure will be required to pay royalties on future product sales, if any, up to the amounts received from the IIA, plus interest indexed to LIBOR. Cell Cure's research and product development activities under the grant are subject to substantial risks and uncertainties, and performed on a best efforts basis. As a result, Cell Cure is not required to make any payments under the grant agreement unless it successfully commercializes *OpRegen*®. Accordingly, pursuant to ASC 730-20, the Cell Cure grant is considered a contract to perform research and development services for others and grant income is recognized as the related research and development expenses are incurred.

Israeli law pertaining to such government grants contain various conditions, including substantial penalties and restrictions on the transfer of intellectual property, or the manufacture, or both, of products developed under the grant outside of Israel, as defined by the IIA.

**12. Income Taxes**

BioTime adopted early the provisions of Accounting Standards Update, ASU 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, on a retrospective basis and due to the full valuation allowance on its deferred tax assets for all periods presented. The adoption of ASU 2015-17 did not have any impact on the consolidated financial statements.

The primary components of the deferred tax assets and liabilities at December 31, 2016 and 2015 were as follows (in thousands):

| Deferred tax assets/(liabilities): | 2016 | 2015 |
|---|---|---|
| Net operating loss carryforwards | $78,116 | $78,268 |
| Research and development and other credits | 7,645 | 8,331 |
| Patents and licenses | (67) | (6,860) |
| Equity method investments | (40,258) | (1,333) |
| Stock options | 1,529 | 670 |
| Other, net | 2,248 | (263) |
| Total | 49,213 | 78,813 |
| Valuation allowance | (49,213) | (78,813) |
| Net deferred tax liabilities | $ - | $ - |

Income taxes differed from the amounts computed by applying the U.S. federal income tax of 34% to pretax losses from operations as a result of the following:

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| Computed tax benefit at federal statutory rate | 34% | 34% | 34% |
| Research and development and other credits | (3%) | 2% | 3% |
| Permanent differences | 2% | (4%) | (1%) |
| Change in valuation allowance | (63%) | (34%) | (24%) |
| State tax benefit, net of effect on federal income taxes | 24% | 10% | 3% |
| Foreign rate differential | 6% | (1%) | (1%) |
| | -% | 7% | 14% |

As of December 31, 2016, BioTime has net operating loss carryforwards of approximately $171.1 million for federal purposes. Of this amount, $22.7 million is attributable to LifeMap Sciences, and $30.6 million is attributable to Oncocyte. As BioTime, LifeMap Sciences and OncoCyte file separate federal income tax returns, their respective net operating loss carryforwards may not be used to offset each other's taxable income. As of December 31, 2016, BioTime has net operating losses of $95 million for state tax purposes. Of this amount, $15.1 is attributable to OncoCyte. Historically, both LifeMap Sciences and OncoCyte have been included in the combined California tax return with BioTime. As a result of the OncoCyte Deconsolidation on February 17, 2017 (see Note 16), OncoCyte will file a separate California return for tax year 2017. Accordingly, the California net operating loss carryforwards attributable to OncoCyte will not be available to BioTime or LifeMap Sciences. The federal and state net operating losses expire in varying amounts between 2018 and 2036. As of December 31, 2016, BioTime's subsidiaries have foreign net operating loss carryforwards of approximately $58.5 million which carry forward indefinitely.

As of December 31, 2016, BioTime has research tax credit carryforwards for federal and state tax purposes of $3.8 million and $3.9 million, respectively. The federal tax credits expire between 2018 and 2036, while the state tax credits have no expiration date.

Although the Asterias Deconsolidation was not a taxable transaction to BioTime and did not result in a tax payment obligation, the $49.0 million gain on the Asterias Deconsolidation generated a deferred tax liability that was fully offset by BioTime's net operating losses. Subsequent to the Asterias Deconsolidation, an unrealized gain of $34.3 million was recorded on the Asterias shares during the year ended December 31, 2016, which was fully offset by available net operating losses and the corresponding release of BioTime's valuation allowance on deferred tax assets. Accordingly, BioTime did not record any provision or benefit for income taxes for the year ended December 31, 2016. The deferred tax liability generated by the Asterias shares BioTime holds are a source of taxable income as prescribed by ASC 740-10-30-17.

BioTime and Asterias completed certain transactions under a Cross-License Agreement and Share Transfer Agreement on February 16, 2016 pursuant to which BioTime transferred certain assets to Asterias. The asset transfer was a taxable transaction to BioTime generating a taxable gain of approximately $3.1 million. BioTime has sufficient current year losses from operations to offset the entire gain resulting in no income taxes due. As the transfer of assets and the resulting taxable gain was due to a direct effect of transactions between a parent company, BioTime, and its then subsidiary, Asterias, BioTime recorded the tax effects of this gain through equity in accordance with ASC 740-20-45-11(g) with a corresponding release of the valuation allowance.

A deferred income tax benefit of $4.5 million was recorded for the year ended December 31, 2015, of which $4.8 million was related to the federal benefit and $290,000 was related to state tax expense. A deferred income tax benefit of $7.4 million was recorded for the year ended December 31, 2014, of which $5.2 million of the benefit was related to federal and $2.2 million was related to state taxes. The deferred tax benefits recorded in 2015 and 2014 were wholly attributable Asterias.

A valuation allowance is provided when it is more likely than not that all or some portion of the deferred tax assets will not be realized. BioTime established a full valuation allowance for all periods presented due to the uncertainty of realizing future tax benefits from its net operating loss carryforwards and other deferred tax assets, including foreign net operating losses generated by its subsidiaries.

On December 31, 2015, BioTime distributed 4.7 million shares of OncoCyte common stock to its shareholders on a pro rata basis. The distribution was accounted for as a dividend in kind for financial reporting purposes. For income tax purposes, the distribution is treated as if BioTime had sold the shares at their fair market value, resulting in a taxable gain to BioTime of approximately $7.4 million. As part of the distribution of OncoCyte common stock in December 2015, Asterias also recognized a taxable gain $819,000. Asterias has sufficient current year losses from operations to offset the entire taxable gain resulting in no income taxes due. As the distribution was treated as a dividend in kind for financial reporting purposes, BioTime recorded the tax effect of the gain in equity instead of the tax provision in accordance ASC 740-20-45-11(g). BioTime had sufficient current year losses from operations to offset the entire taxable gain resulting in no income taxes due.

During 2015, OncoCyte sold 259,712 BioTime common shares in open market transactions that resulted in a taxable gain of $815,000. This taxable gain was fully offset by current operating losses resulting in no income taxes due from the sale.

In connection with the above transactions related to the taxable gains, BioTime and subsidiaries utilized approximately $9.1 million in net operating loss carryforwards with a corresponding release of the valuation allowance recorded through equity in accordance with ASC 740-20-45-11(g).

Internal Revenue Code Section 382 places a limitation ("Section 382 Limitation") on the amount of taxable income that can be offset by net operating loss ("NOL") carryforwards after a change in control (generally greater than 50% change in ownership within a three-year period) of a loss corporation. California has similar rules. Generally, after a control change, a loss corporation cannot deduct NOL carryforwards in excess of the Section 382 Limitation. Due to these "change in ownership" provisions, utilization of the NOL and tax credit carryforwards may be subject to an annual limitation regarding their utilization against taxable income in future periods.

BioTime files a U.S. federal income tax return as well as various state and foreign income tax returns. In general, BioTime is no longer subject to tax examination by major taxing authorities for years before 2012. Although the statute is closed for purposes of assessing additional income and tax in these years, the taxing authorities may still make adjustments to the net operating loss and credit carryforwards used in open years. Therefore, the statute should be considered open as it relates to the net operating loss and credit carryforwards.

BioTime's practice is to recognize interest and penalties related to income tax matters in tax expense. As of December 31, 2016 and 2015, BioTime has no accrued interest and penalties. BioTime may be subject to potential examination by U.S. federal, U.S. states or foreign jurisdiction authorities in the areas of income taxes. These potential examinations may include questioning the timing and amount of deductions, the nexus of income among various tax jurisdictions and compliance with U.S. federal, U.S. state and foreign tax laws. BioTime's management does not expect that the total amount of unrecognized tax benefits will materially change over the next twelve months.

**13. Segment Information**

BioTime's executive management team, as a group, represents the entity's chief operating decision makers. BioTime's executive management team views BioTime's operations as one segment that includes, the research and development of therapeutic products for oncology, orthopedics, retinal and neurological diseases and disorders, blood and vascular system diseases and disorders, blood plasma volume expansion, diagnostic products for the early detection of cancer, and hydrogel products that may be used in surgery, and products for human embryonic stem cell research. As a result, the financial information disclosed materially represents all of the financial information related to BioTime's sole operating segment.

**14. Enterprise-wide Disclosures**

*Geographic Area Information*

Total revenues, including license fees, royalties, grant income, and other revenues by geographic area are based on the country of domicile of the licensee or grantor (in thousands):

| | Revenues for the Year Ended December 31, | | |
|---|---|---|---|
| **Geographic Area** | **2016** | **2015** | **2014** |
| Domestic | $ 4,497 | $ 5,976 | $ 3,586 |
| Asia | 1,426 | 1,060 | 1,658 |
| Total revenues | $ 5,923 | $ 7,036 | $ 5,244 |

The composition of BioTime's long-lived assets, consisting of property, plant and equipment, net, between those in the United States and in foreign countries is set forth below (in thousands):

| | **2016(1)** | **2015** |
|---|---|---|
| Domestic | $ 3,418 | $ 7,132 |
| Foreign | 2,111 | 407 |
| Total | $ 5,529 | $ 7,539 |

(1) Reflects the effect of the Asterias Deconsolidation.

Assets in foreign countries principally include laboratory equipment and leasehold improvements in Israel.

*Major Sources of Revenues*

The following table shows the sources of BioTime's revenues, as a percentage of total revenues, that were recognized during the years ended December 31, 2016, 2015, and 2014:

| | Revenues for the Year Ended December 31, | | |
|---|---|---|---|
| **Sources of Revenues** | **2016** | **2015** | **2014** |
| CIRM grant income | 38.0% | 42.7% | 19.7% |
| NIH grant income | -% | 6.5% | 12.5% |
| IIA (formerly OCS) grant income (Cell Cure, Israel) | 24.0% | 14.4% | 31.3% |
| Subscriptions, advertising and other (various customers) (1) | 35.0% | 29.4% | 32.5% |
| Other (1) | 3.0% | 7.0% | 4.0% |

(1) No individual customer greater than 5% of total revenues.

During 2016, BioTime received $972,000 and recognized $668,000 (net of $304,000 in royalty and commission fees) in net subscription and advertisement revenues through LifeMap Sciences, an online database business primarily related to its *GeneCards*® database. During 2015, BioTime received $1,357,000 and recognized $679,000 (net of $678,000 in royalty and commission fees) in net subscription and advertisement revenues through LifeMap Sciences.

**15. Selected Quarterly Financial Information (UNAUDITED, in thousands, except per share data)**

BioTime has derived this data from the unaudited consolidated interim financial statements that, in BioTime's opinion, have been prepared on substantially the same basis as the audited consolidated financial statements contained herein and include all normal recurring adjustments necessary for a fair presentation of the financial information for the periods presented. These unaudited consolidated quarterly results should be read in conjunction with the consolidated financial statements and notes thereto included herein. The consolidated operating results in any quarter are not necessarily indicative of the consolidated results that may be expected for any future period.

| **Year Ended December 31, 2016** | **First Quarter** | **Second Quarter** | **Third Quarter** | **Fourth Quarter** |
|---|---|---|---|---|
| Revenues, net | $ 1,848 | $ 1,171 | $ 1,441 | $ 1,103 |
| Operating expenses | 25,606 | 15,574 | 10,996 | 12,356 |
| Loss from operations | (23,758) | (14,403) | (9,555) | (11,253) |
| Net income (loss) attributable to BioTime, Inc. | (17,112) | 24,549 | 31,199 | (4,945) |
| Basic and diluted net income (loss) per share | $ (0.19) | $ 0.26 | $ 0.30 | $ (0.05) |
| **Year Ended December 31, 2015** | | | | |
| Revenues, net | $ 1,000 | $ 1,749 | $ 1,874 | $ 1,306 |
| Operating expenses | 14,502 | 15,245 | 18,978 | 23,013 |
| Loss from operations | (13,502) | (13,496) | (17,104) | (21,707) |
| Net loss attributable to BioTime, Inc. (1) | (10,167) | (9,691) | (13,626) | (13,507) |
| Basic and diluted net loss per share | $ (0.13) | $ (0.12) | $ (0.18) | $ (0.16) |

(1) Net of $4.5 million of deferred income tax benefits for 2015, entirely attributable to Asterias.

**16. Subsequent Events**

During February 2017, BioTime sold 7,453,704 common shares in an underwritten public offering. The offering price to the public was $2.70 per share and net proceeds to BioTime were approximately $18.7 million, after deducting underwriting discounts, commissions and expenses related to the financing.

On February 17, 2017, certain of OncoCyte investors exercised 625,000 Offering Warrants at an exercise price of $3.25 per warrant for total exercise cash proceeds of $2.0 million (the "Warrant exercise"). The Offering Warrants had been issued as part of OncoCyte's financing that was completed on August 29, 2016 (see Note 9). In order to induce the investors to complete the Warrant exercise and, in conjunction with the Warrant exercise, OncoCyte issued new warrants to those investors (the "New Warrants"). Certain investors received 200,000 New Warrants with an exercise price of $5.50 per warrant share and the other investor received 212,500 New Warrants with an exercise of $3.25 per warrant share. The New Warrants are exercisable at any time for five years from February 17, 2017.

As a result of the issuance of 625,000 shares of OncoCyte common stock in the Warrant exercise, as of February 17, 2017, BioTime owned less than 50% of the OncoCyte outstanding common stock. Under GAAP, loss of control of a subsidiary is deemed to have occurred when, among other things, a parent company owns less than a majority of the outstanding common stock of the subsidiary, lacks a controlling financial interest in the subsidiary, and is unable to unilaterally control the subsidiary through other means such as having the ability or being able to obtain the ability to elect a majority of the subsidiary's Board of Directors. BioTime determined that all of these loss of control factors were present with respect to OncoCyte on February 17, 2017. Accordingly, BioTime has deconsolidated OncoCyte's financial statements and results of operations from BioTime, effective February 17, 2017, in accordance with ASC, 810-10-40-4(c), *Consolidation*.

**Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure**

Not applicable.

**Item 9A. Controls and Procedures**

*Evaluation of Disclosure Controls and Procedures*

It is management's responsibility to establish and maintain adequate internal control over all financial reporting pursuant to Rule 13a-15 under the Securities Exchange Act of 1934 ("Exchange Act"). Our management, including our principal executive officer and our principal financial officer, have reviewed and evaluated the effectiveness of our disclosure controls and procedures as of the end of our fourth quarter. Following this review and evaluation, management collectively determined that our disclosure controls and procedures are effective to ensure that information required to be disclosed by us in reports that we file or submit under the Exchange Act (i) is recorded, processed, summarized and reported within the time periods specified in SEC rules and forms; and (ii) is accumulated and communicated to management, including our chief executive officer and our chief financial officer, as appropriate to allow timely decisions regarding required disclosure.

*Changes in Internal Control over Financial Reporting*

There were no changes in our internal control over financial reporting that occurred during the period covered by this Annual Report on Form 10-K that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

*Management's Report on Internal Control over Financial Reporting*

Our management is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting, as defined in Exchange Act Rule 13a-15(f), is a process designed by, or under the supervision of, our principal executive officer, our principal operations officer, and our principal financial officer, and effected by our Board of Directors, management, and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles and includes those policies and procedures that:

- Pertain to the maintenance of records that in reasonable detail accurately and fairly reflect the transactions and dispositions of our assets;
- Provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that our receipts and expenditures are being made only in accordance with authorizations of our management and directors; and
- Provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of our assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation. The scope of management's assessment of the effectiveness of internal control over financial reporting includes our consolidated subsidiaries.

Our management assessed the effectiveness of our internal control over financial reporting as of December 31, 2016, based on criteria established in the 2013 Internal Control - Integrated Framework issued by COSO. Based on this assessment, management believes that, as of that date, our internal control over financial reporting was effective.

This annual report includes an attestation report of our registered public accounting firm regarding internal control over financial reporting for the year ended December 31, 2016. The attestation is included with the accounting firm's report on our audited consolidated financial statements.

**Item 9B. Other Information**

Not applicable

## PART III

### Item 10. Directors, Executive Officers, and Corporate Governance

The name, age, and background of each of our directors are contained under the caption "Election of Directors" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and are incorporated herein by reference. Information about our executive officers, committees of the Board of Directors, and compensation of directors is reported under the caption "Corporate Governance" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and is incorporated herein by reference.

We have a written Code of Ethics that applies to our principal executive officer, our principal financial officer and accounting officer, our other executive officers, and our directors. The purpose of the Code of Ethics is to promote (i) honest and ethical conduct, including the ethical handling of actual or apparent conflicts of interest between personal and professional relationships; (ii) full, fair, accurate, timely, and understandable disclosure in reports and documents that we file with or submit to the Securities and Exchange Commission and in our other public communications; (iii) compliance with applicable governmental rules and regulations; (iv) prompt internal reporting of violations of the Code of Ethics to an appropriate person or persons identified in the Code; and (v) accountability for adherence to the Code. A copy of our Code of Ethics has been posted on our internet website and can be found at *www.biotimeinc.com*. If we amend or waive a provision of our Code of Ethics that applies to our chief executive officer or chief financial officer, we will post the amended Code of Ethics or information about the waiver on our internet website.

Information about our compliance with Section 16(a) of the Securities Exchange Act of 1934 is reported under the caption "Compliance with Section 16(a) of the Securities Exchange Act of 1934" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and is incorporated herein by reference.

### Item 11. Executive Compensation

Information on compensation of our executive officers is reported under the caption "Executive Compensation" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and is incorporated herein by reference.

### Item 12. Security Ownership of Certain Beneficial Owners and Management, and Related Stockholder Matters

Information on the number of common shares of BioTime beneficially owned by each shareholder known by us to be the beneficial owner of 5% or more of our common shares, and by each director and named executive officer, and by all directors and named executive officers as a group, is contained under the caption "Principal Shareholders" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and is incorporated herein by reference.

### Item 13. Certain Relationships and Related Transactions, and Director Independence

Information about transactions with related persons; review, and approval or ratification of transactions with related persons; and director independence is reported under the caption "Election of Directors" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and is incorporated herein by reference.

### Item 14. Principal Accounting Fees and Services

Information about our Audit Committee's pre-approval policy for audit services, and information on our principal accounting fees and services is reported under the caption "Ratification of the Selection of Our Independent Auditors" in our Proxy Statement for our 2017 Annual Meeting of Shareholders, and is incorporated herein by reference.

## PART IV

**Item 15. Exhibits, Financial Statement Schedules**

(a-1) Financial Statements.

The following financial statements of BioTime, Inc. are filed in the Form 10-K:

Consolidated balance sheets
Consolidated statements of operations
Consolidated statements of comprehensive loss
Consolidated statements of changes in shareholders' equity
Consolidated statements of cash flows

Notes to Financial Statements

(a-2) Financial Statement Schedules

We will amend this Report to include audited financial statements of Asterias for the year ended December 31, 2016. All other schedules are omitted because the required information is inapplicable or the information is presented in the financial statements or the notes thereto.

(a-3) Exhibits.

| Exhibit Numbers | Description |
|---|---|
| 3.1 | Articles of Incorporation with all amendments (1) |
| 3.2 | By-Laws, As Amended (2) |
| 4.1 | Specimen of Common Share Certificate (3) |
| 4.2 | Form of Warrant Issued June 2013 (4) |
| 4.3 | Warrant Agreement, dated as of October 1, 2013, as amended September 19, 2014, between BioTime, Inc. and American Stock Transfer & Trust Company, LLC as Warrant Agent for the benefit of Asterias Biotherapeutics, Inc. (5) |
| 4.4 | Warrant Issued October 1, 2013 to Asterias Biotherapeutics, Inc. (included in Exhibit 4.7) (5) |
| 10.1 | Intellectual Property Agreement between BioTime, Inc. and Hal Sternberg (3) |
| 10.2 | Intellectual Property Agreement between BioTime, Inc. and Judith Segall (3) |
| 10.3 | 2002 Stock Option Plan, as amended (6) |
| 10.4 | Employment Agreement, dated October 10, 2007, between BioTime, Inc. and Michael D. West. (7) |
| 10.5 | Commercial License and Option Agreement between BioTime and Wisconsin Alumni Research Foundation (8) |
| 10.6 | License Agreement, dated July 10, 2008, between Embryome Sciences, Inc. and Advanced Cell Technology, Inc. (9) |
| 10.7 | First Amendment of Commercial License and Option Agreement, dated March 11, 2009, between BioTime and Wisconsin Alumni Research Foundation (10) |
| 10.8 | Amended and Restated Shareholders Agreement, dated October 7, 2010, by and among ES Cell International Pte. Ltd., BioTime, Inc., Teva Pharmaceutical Industries, Limited, HBL-Hadasit Bio-Holdings, Ltd., and Cell Cure Neurosciences Ltd. (11) |
| 10.9 | Amended and Restated Research and License Agreement, dated October 7, 2010, between Hadasit Medical Research Services and Development Ltd. and Cell Cure Neurosciences Ltd. (11) |

| Exhibit Numbers | Description |
|---|---|
| 10.10 | Additional Research Agreement, dated October 7, 2010, between Hadasit Medical Research Services and Development Ltd. and Cell Cure Neurosciences Ltd. (11) |
| 10.11 | OrthoCyte Corporation 2010 Stock Option Plan; Form of OrthoCyte Corporation Stock Option Agreement (11) |
| 10.12 | BioTime Asia, Limited 2010 Stock Option Plan; Form of BioTime Asia Limited Stock Option Agreement (11) |
| 10.13 | License Agreement between BioTime, Inc. and Cornell University (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (12) |
| 10.14 | LifeMap, Inc. 2011 Stock Option Plan; and Form of LifeMap, Inc. Stock Option Agreement (13) |
| 10.15 | Exclusive License Agreement, dated February 15, 2006, between Glycosan BioSystems, Inc. and the University of Utah Research Foundation, as amended (14) |
| 10.16 | Form of Employee Incentive Stock Option Agreement (15) |
| 10.17 | Form of Non-employee Director Stock Option Agreement (15) |
| 10.18 | Option Agreement, dated March 4, 2014, between BioTime and certain investors (16) |
| 10.19 | Co-Development and Option Agreement, dated May 6, 2014, between LifeMap Solutions, Inc. and the Icahn School of Medicine at Mount Sinai (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (17) |
| 10.20 | LifeMap Solutions, Inc. 2014 Stock Option Plan (17) |
| 10.21 | Form of LifeMap Solutions, Inc. Incentive Stock Option Agreement (17) |
| 10.22 | Form of LifeMap Solutions, Inc. Stock Option Agreement (17) |
| 10.23 | Employment Agreement, dated December 29, 2014, between BioTime, Inc. Aditya Mohanty (18) |
| 10.24 | First Amendment to Co-Development and Option Agreement, dated March 7, 2015, between Icahn School of Medicine at Mount Sinai and LifeMap Solutions, Inc. (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (19) |
| 10.25 | 2012 Equity Incentive Plan, as amended (20) |
| 10.26 | Stock Purchase Agreements, dated September 14, 2015, between BioTime, Inc. and certain investors (21) |
| 10.27 | Research & Development Agreement, dated September 29, 2015, between OrthoCyte Corporation and Heraeus Medical GmbH (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (21) |
| 10.28 | License Agreement, dated September 29, 2015, between OrthoCyte Corporation and Heraeus Medical GmbH (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (21) |
| 10.29 | Stock Purchase Agreements Between BioTime and certain investors (21) |
| 10.30 | Employment Agreement, dated November 16, 2015, between BioTime, Inc. and Russell Skibsted (22) |
| 10.31 | Employment Termination and Release Agreement, dated November 18, 2015, between BioTime, Inc. and Robert W. Peabody (23) |
| 10.32 | Employment Agreement, dated November 18, 2015, between LifeMap Solutions, Inc. and Robert W. Peabody (23) |
| 10.33 | Consulting Agreement, dated November 18, 2015, between BioTime, Inc. and Robert W. Peabody (23) |
| 10.34 | Amendment of Employment Agreement, dated November 24, 2015, between BioTime, Inc. and Michael D. West (24) |
| 10.35 | Amendment of Employment Agreement, dated November 24, 2015, between BioTime, Inc. and Aditya Mohanty (24) |

| Exhibit Numbers | Description |
|---|---|
| 10.36 | Lease, dated December 10, 2015, between BioTime, Inc. and BSREP Marina Village Owner LLC (25) |
| 10.37 | Cross-License Agreement, dated February 16, 2016, among Asterias Biotherapeutics, Inc., BioTime, Inc., and ES Cell International Pte. Ltd. (26) |
| 10.38 | Cell Cure Neurosciences Ltd. Share Option Plan * |
| 10.39 | Form of Cell Cure Neurosciences Ltd. Share Option Plan Option Agreement * |
| 21.1 | List of Subsidiaries * |
| 23.1 | Consent of OUM & Co. LLP * |
| 31 | Rule 13a-14(a)/15d-14(a) Certification * |
| 32 | Section 1350 Certification * |
| 101 | Interactive Data File |
| 101.INS | XBRL Instance Document * |
| 101.SCH | XBRL Taxonomy Extension Schema * |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase * |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase* |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase* |
| 101.DEF | XBRL Taxonomy Extension Definition Document* |

(1) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016

(2) Incorporated by reference to Registration Statement on Form S-1, File Number 33-48717 and Post-Effective Amendment No. 1 thereto filed with the Securities and Exchange Commission on June 22, 1992, and August 27, 1992, respectively

(3) Incorporated by reference to Registration Statement on Form S-1, File Number 33-44549 filed with the Securities and Exchange Commission on December 18, 1991, and Amendment No. 1 and Amendment No. 2 thereto filed with the Securities and Exchange Commission on February 6, 1992 and March 7, 1992, respectively

(4) Incorporated by reference to BioTime's Current Report on Form 8-K filed with the Securities and Exchange Commission on June 3, 2013

(5) Incorporated by reference to BioTime's Current Report on Form 8-K filed with the Securities and Exchange Commission on September 23, 2014

(6) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2009

(7) Incorporated by reference to BioTime's Annual Report on Form 10-KSB for the year ended December 31, 2007

(8) Incorporated by reference to BioTime's Current Report on Form 8-K, filed January 9, 2008

(9) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008

(10) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2008

(11) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2010

(12) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended September 30, 2011

(13) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2011

(14) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012

(15) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended September 30, 2013

(16) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2013

(17) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2014

(18) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2014

(19) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015

(20) Incorporated by reference to Registration Statement on Form S-8, File Number 333-205661 filed with the Securities and Exchange Commission on July 15, 2015

(21) Incorporated by reference to BioTime's Quarterly Report on Form 10/Q for the quarter ended September 30, 2015

(22) Incorporated by reference to BioTime's Current Report on Form 8-K, filed November 16, 2015

(23) Incorporated by reference to BioTime's Current Report on Form 8-K, filed November 18, 2015

(24) Incorporated by reference to BioTime's Current Report on Form 8-K, filed November 24, 2015

(25) Incorporated by reference to BioTime's Current Report on Form 8-K, filed December 9, 2015

(26) Incorporated by reference to BioTime's Current Report on Form 8-K, filed February 18, 2016

* Filed herewith

**Item 16. Summary**

None

## SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this report on Form 10-K to be signed on its behalf by the undersigned, thereunto duly authorized on the 16th day of March, 2017.

BIOTIME, INC.

By: /s/*Michael D. West*
Michael D. West, Ph.D.
Co-Chief Executive Officer

By: /s/*Aditya Mohanty*
Aditya Mohanty
Co-Chief Executive Officer

| Signature | Title | Date |
|---|---|---|
| /s/*Michael D. West*<br>MICHAEL D. WEST, PH.D. | Co-Chief Executive Officer and Director (Principal Executive Officer) | March 16, 2017 |
| /s/*Aditya Mohanty*<br>ADITYA MOHANTY | Co-Chief Executive Officer and Director (Principal Executive Officer) | March 16, 2017 |
| /s/*Russell Skibsted*<br>RUSSELL SKIBSTED | Chief Financial Officer (Principal Financial and Accounting Officer) | March 16, 2017 |
| /s/*Deborah Andrews*<br>DEBORAH ANDREWS | Director | March 16, 2017 |
| /s/*Neal C. Bradsher*<br>NEAL C. BRADSHER | Director | March 16, 2017 |
| /s/*Stephen C. Farrell*<br>STEPHEN C. FARRELL | Director | March 16, 2017 |
| /s/*Alfred D. Kingsley*<br>ALFRED D. KINGSLEY | Director | March 16, 2017 |
| /s/*Michael H. Mulroy*<br>MICHAEL H. MULROY | Director | March 16, 2017 |
| /s/*Angus C. Russell*<br>ANGUS C. RUSSELL | Director | March 16, 2017 |
| /s/*David Schlachet*<br>DAVID SCHLACHET | Director | March 16, 2017 |

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

# FORM 10-K/A-1

[X] ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934

For the fiscal year ended December 31, 2016

OR

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

For the transition period from___________ to __________

Commission file number 1-12830

# BioTime, Inc.

(Exact name of registrant as specified in its charter)

| | |
|---|---|
| **California** | **94-3127919** |
| (State or other jurisdiction of incorporation or organization) | (I.R.S. Employer Identification No.) |

**1010 Atlantic Avenue, Suite 102**
**Alameda, California 94501**
(Address of principal executive offices) (Zip Code)

Registrant's telephone number, including area code **(510) 521-3390**

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

| **Title of each class** | **Name of exchange on which registered** |
|---|---|
| **Common shares, no par value** | **NYSE MKT** |
| **Common share purchase warrants expiring October 1, 2018** | **NYSE MKT** |

**Securities registered pursuant to Section 12(g) of the Act:**
**None**

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

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

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

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

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

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

| | |
|---|---|
| Large accelerated filer [ ] | Accelerated filer [X] |
| Non-accelerated filer [ ] (Do not check if a smaller reporting company) | Smaller reporting company [ ] |

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act): Yes [ ] No [X]

The approximate aggregate market value of voting common shares held by non-affiliates computed by reference to the price at which common shares were last sold as of June 30, 2015 was $165,569,534. Shares held by each executive officer and director and by each person who beneficially owns more than 5% of the outstanding common shares have been excluded in that such persons may under certain circumstances be deemed to be affiliates. This determination of affiliate status is not necessarily a conclusive determination for other purposes.

The number of common shares outstanding as of March 9, 2017 was110,853,754.

Documents Incorporated by Reference

Portions of the registrant's Proxy Statement for 2017 Annual Meeting of Shareholders are incorporated by reference in Part III

**EXPLANATORY NOTE**

BioTime, Inc. ("BioTime") is filing this Amendment No. 1 (the "Amendment") to its Annual Report on Form 10-K for the year ended December 31, 2016, as originally filed with the Securities and Exchange Commission (the "SEC") on March 16, 2017 (the "Original Filing") for the purpose of providing separate financial statements of Asterias Biotherapeutics, Inc. ("Asterias") in accordance with Rule 3-09 of Regulation S-X. As indicated in its Original Filing, Asterias is an equity method investee in which BioTime owns approximately 46% as of December 31, 2016. BioTime is filing this Amendment to amend Item 15 to include audited financial statements of Asterias as of December 31, 2016 and 2015 and for each of the three years ended December 31, 2016 which were included in Asterias' Annual Report on Form 10-K filed with the SEC on March 28, 2017 (the "Asterias Financial Statements").

The Asterias Financial Statements were prepared and provided to BioTime by Asterias, and were not available at the time of the Original Filing. Asterias is solely responsible for the form and content of the Asterias Financial Statements provided herewith.

This Amendment does not reflect events occurring after the date of the Original Filing or modify or update any disclosures that may have been affected by subsequent events.

## PART IV

**Item 15. Exhibits, Financial Statement Schedules**

(a-1) Financial Statements.

The following financial statements of BioTime, Inc. are filed in the Form 10-K:
Consolidated balance sheets
Consolidated statements of operations
Consolidated statements of comprehensive loss
Consolidated statements of shareholders' equity
Consolidated statements of cash flows
Notes to Consolidated Financial Statements

(a-3) Exhibits.

| Exhibit Numbers | Description |
|---|---|
| 3.1 | Articles of Incorporation with all amendments (1) |
| 3.2 | By-Laws, As Amended (2) |
| 4.1 | Specimen of Common Share Certificate (3) |
| 4.2 | Form of Warrant Issued June 2013 (4) |
| 4.3 | Warrant Agreement, dated as of October 1, 2013, as amended September 19, 2014, between BioTime, Inc. and American Stock Transfer & Trust Company, LLC as Warrant Agent for the benefit of Asterias Biotherapeutics, Inc. (5) |
| 4.4 | Warrant Issued October 1, 2013 to Asterias Biotherapeutics, Inc. (included in Exhibit 4.7) (5) |
| 10.1 | Intellectual Property Agreement between BioTime, Inc. and Hal Sternberg (3) |
| 10.2 | Intellectual Property Agreement between BioTime, Inc. and Judith Segall (3) |
| 10.3 | 2002 Stock Option Plan, as amended (6) |
| 10.4 | Employment Agreement, dated October 10, 2007, between BioTime, Inc. and Michael D. West. (7) |
| 10.5 | Commercial License and Option Agreement between BioTime and Wisconsin Alumni Research Foundation (8) |
| 10.6 | License Agreement, dated July 10, 2008, between Embryome Sciences, Inc. and Advanced Cell Technology, Inc. (9) |
| 10.7 | First Amendment of Commercial License and Option Agreement, dated March 11, 2009, between BioTime and Wisconsin Alumni Research Foundation (10) |
| 10.8 | Amended and Restated Shareholders Agreement, dated October 7, 2010, by and among ES Cell International Pte. Ltd., BioTime, Inc., Teva Pharmaceutical Industries, Limited, HBL-Hadasit Bio-Holdings, Ltd., and Cell Cure Neurosciences Ltd. (11) |

| | |
|---|---|
| 10.9 | Amended and Restated Research and License Agreement, dated October 7, 2010, between Hadasit Medical Research Services and Development Ltd. and Cell Cure Neurosciences Ltd. (11) |
| 10.10 | Additional Research Agreement, dated October 7, 2010, between Hadasit Medical Research Services and Development Ltd. and Cell Cure Neurosciences Ltd. (11) |
| 10.11 | OrthoCyte Corporation 2010 Stock Option Plan; Form of OrthoCyte Corporation Stock Option Agreement (11) |
| 10.12 | BioTime Asia, Limited 2010 Stock Option Plan; Form of BioTime Asia Limited Stock Option Agreement (11) |
| 10.13 | License Agreement between BioTime, Inc. and Cornell University (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (12) |
| 10.14 | LifeMap, Inc. 2011 Stock Option Plan; and Form of LifeMap, Inc. Stock Option Agreement (13) |
| 10.15 | Exclusive License Agreement, dated February 15, 2006, between Glycosan BioSystems, Inc. and the University of Utah Research Foundation, as amended (14) |
| 10.16 | Form of Employee Incentive Stock Option Agreement (15) |
| 10.17 | Form of Non-employee Director Stock Option Agreement (15) |
| 10.18 | Option Agreement, dated March 4, 2014, between BioTime and certain investors (16) |
| 10.19 | Co-Development and Option Agreement, dated May 6, 2014, between LifeMap Solutions, Inc. and the Icahn School of Medicine at Mount Sinai (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (17) |
| 10.20 | LifeMap Solutions, Inc. 2014 Stock Option Plan (17) |
| 10.21 | Form of LifeMap Solutions, Inc. Incentive Stock Option Agreement (17) |
| 10.22 | Form of LifeMap Solutions, Inc. Stock Option Agreement (17) |
| 10.23 | Employment Agreement, dated December 29, 2014, between BioTime, Inc. Aditya Mohanty (18) |
| 10.24 | First Amendment to Co-Development and Option Agreement, dated March 7, 2015, between Icahn School of Medicine at Mount Sinai and LifeMap Solutions, Inc. (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (19) |
| 10.25 | 2012 Equity Incentive Plan, as amended (20) |
| 10.26 | Stock Purchase Agreements, dated September 14, 2015, between BioTime, Inc. and certain investors (21) |
| 10.27 | Research & Development Agreement, dated September 29, 2015, between OrthoCyte Corporation and Heraeus Medical GmbH (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (21) |
| 10.28 | License Agreement, dated September 29, 2015, between OrthoCyte Corporation and Heraeus Medical GmbH (Portions of this exhibit have been omitted pursuant to a request for confidential treatment) (21) |

| | |
|---|---|
| 10.29 | Stock Purchase Agreements Between BioTime and certain investors (21) |
| 10.30 | Employment Agreement, dated November 16, 2015, between BioTime, Inc. and Russell Skibsted (22) |
| 10.31 | Employment Termination and Release Agreement, dated November 18, 2015, between BioTime, Inc. and Robert W. Peabody (23) |
| 10.32 | Employment Agreement, dated November 18, 2015, between LifeMap Solutions, Inc. and Robert W. Peabody (23) |
| 10.33 | Consulting Agreement, dated November 18, 2015, between BioTime, Inc. and Robert W. Peabody (23) |
| 10.34 | Amendment of Employment Agreement, dated November 24, 2015, between BioTime, Inc. and Michael D. West (24) |
| 10.35 | Amendment of Employment Agreement, dated November 24, 2015, between BioTime, Inc. and Aditya Mohanty (24) |
| 10.36 | Lease, dated December 10, 2015, between BioTime, Inc. and BSREP Marina Village Owner LLC (25) |
| 10.37 | Cross-License Agreement, dated February 16, 2016, among Asterias Biotherapeutics, Inc., BioTime, Inc., and ES Cell International Pte. Ltd. (26) |
| 10.38 | Cell Cure Neurosciences Ltd. Share Option Plan (27) |
| 10.39 | Form of Cell Cure Neurosciences Ltd. Share Option Plan Option Agreement (27) |
| 21.1 | List of Subsidiaries (27) |
| 23.1 | Consent of OUM & Co. LLP (27) |
| 23.2 | Consent of OUM & Co. LLP * |
| 31 | Rule 13a-14(a)/15d-14(a) Certification * |
| 32 | Section 1350 Certification * |
| 99.1 | Financial Statements of Asterias Biotherapeutics, Inc.* |
| 101 | Interactive Data File |
| 101.INS | XBRL Instance Document (27) |
| 101.SCH | XBRL Taxonomy Extension Schema (27) |
| 101.CAL | XBRL Taxonomy Extension Calculation Linkbase (27) |
| 101.LAB | XBRL Taxonomy Extension Label Linkbase (27) |
| 101.PRE | XBRL Taxonomy Extension Presentation Linkbase (27) |
| 101.DEF | XBRL Taxonomy Extension Definition Document (27) |

(1) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2016

(2) Incorporated by reference to Registration Statement on Form S-1, File Number 33-48717 and Post-Effective Amendment No. 1 thereto filed with the Securities and Exchange Commission on June 22, 1992, and August 27, 1992, respectively

(3) Incorporated by reference to Registration Statement on Form S-1, File Number 33-44549 filed with the Securities and Exchange Commission on December 18, 1991, and Amendment No. 1 and Amendment No. 2 thereto filed with the Securities and Exchange Commission on February 6, 1992 and March 7, 1992, respectively

(4) Incorporated by reference to BioTime's Current Report on Form 8-K filed with the Securities and Exchange Commission on June 3, 2013

(5) Incorporated by reference to BioTime's Current Report on Form 8-K filed with the Securities and Exchange Commission on September 23, 2014

(6) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2009

(7) Incorporated by reference to BioTime's Annual Report on Form 10-KSB for the year ended December 31, 2007

(8) Incorporated by reference to BioTime's Current Report on Form 8-K, filed January 9, 2008

(9) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2008

(10) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2008

(11) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2010

(12) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended September 30, 2011

(13) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2011

(14) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended September 30, 2012

(15) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended September 30, 2013

(16) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2013

(17) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended June 30, 2014

(18) Incorporated by reference to BioTime's Annual Report on Form 10-K for the year ended December 31, 2014

(19) Incorporated by reference to BioTime's Quarterly Report on Form 10-Q for the quarter ended March 31, 2015

(20) Incorporated by reference to Registration Statement on Form S-8, File Number 333-205661 filed with the Securities and Exchange Commission on July 15, 2015

(21) Incorporated by reference to BioTime's Quarterly Report on Form 10/Q for the quarter ended September 30, 2015

(22) Incorporated by reference to BioTime's Current Report on Form 8-K, filed November 16, 2015

(23) Incorporated by reference to BioTime's Current Report on Form 8-K, filed November 18, 2015

(24) Incorporated by reference to BioTime's Current Report on Form 8-K, filed November 24, 2015

(25) Incorporated by reference to BioTime's Current Report on Form 8-K, filed December 9, 2015

(26) Incorporated by reference to BioTime's Current Report on Form 8-K, filed February 18, 2016

(27) Previously filed with BioTime's Annual Report on Form 10-K for the year ended December 31, 2016, filed March 16, 2017

* Filed herewith

(c) Financial Statement Schedules of Subsidiaries Not Consolidated and Fifty Percent or Less Owned Persons

The following financial statements of Asterias Biotherapeutics, Inc. are incorporated by reference to the financial statements included in Asterias' Annual Report on Form 10-K for the year ended December 31, 2016, filed with the SEC on March 28, 2017, and filed herewith as Exhibit 99.1.

Balance sheets as at December 31, 2016 and 2015
Statements of operations for the years ended December 31 2016, 2015, and 2014
Statements of comprehensive loss for the years ended December 31 2016, 2015, and 2014
Statement of stockholders' equity for the years ended December 31 2016, 2015, and 2014
Statements of cash flows for the years ended December 31 2016, 2015, and 2014
Notes to Financial Statements

## SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the Registrant has duly caused this Amendment No. 1 on Form 10-K/A to be signed on its behalf by the undersigned, thereunto duly authorized on the 28th day of March 2017.

BIOTIME, INC.

By: */s/ Michael D. West*
Michael D. West, Ph.D.
Co-Chief Executive Officer

By: */s/ Aditya Mohanty*
Aditya Mohanty
Co-Chief Executive Officer

**Exhibit 23.2**

**CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

We consent to the incorporation by reference in Registration Statements on Form S-2 (Registration Nos. 333-128083 and 333-109442), Form S-3 (Registration Nos. 333-166862, 333-183557, 333-187710, 333-188066, 333-201824, and 333-209000), and Form S-8 (Registration Nos. 333-101651, 333-122844, 333-163396, 333-192531 and 333-205661) and related prospectuses of BioTime, Inc. of our report dated March 28, 2017, relating to the financial statements of Asterias Biotherapeutics, Inc., included in this Annual Report on Form 10-K/A of BioTime, Inc. for the year ended December 31, 2016.

*/s/ OUM & CO. LLP*

San Francisco, California
March 28, 2017

**Exhibit 31**

**CERTIFICATIONS**

I, Michael D. West, certify that:

1. I have reviewed this annual report on Form 10-K/A of BioTime, Inc.

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

Date: March 28, 2017

*/s/ Michael D. West*

Michael D. West
Co-Chief Executive Officer

**Exhibit 31**

**CERTIFICATIONS**

I, Aditya Mohanty, certify that:

1. I have reviewed this annual report on Form 10-K/A of BioTime, Inc.

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

Date: March 28, 2017

*/s/ Aditya Mohanty*

Aditya Mohanty
Co-Chief Executive Officer

**Exhibit 31**

**CERTIFICATIONS**

I, Russell Skibsted, certify that:

1. I have reviewed this annual report on Form 10-K/A of BioTime, Inc.

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

Date: March 28, 2017

*/s/ Russell Skibsted*

Russell Skibsted
Chief Financial Officer

**Exhibit 32**

**CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Annual Report on Form 10-K/A of BioTime, Inc. (the "Company") for the year ended December 31, 2016 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), we, Michael D. West, Co-Chief Executive Officer, Aditya Mohanty, Co-Chief Executive Officer, and Russell Skibsted, Chief Financial Officer of the Company, certify pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

Date: March 28, 2017

*/s/ Michael D. West*
Michael D. West Ph.D.
Co-Chief Executive Officer

*/s/ Aditya Mohanty*
Aditya Mohanty
Co-Chief Executive Officer

*/s/ Russell Skibsted*
Russell Skibsted
Chief Financial Officer

**Exhibit 99.1**

**REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM**

Board of Directors and Stockholders
Asterias Biotherapeutics, Inc.

We have audited the accompanying balance sheets of Asterias Biotherapeutics, Inc. as of December 31, 2016 and 2015, and the related statements of operations, comprehensive loss, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2016. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Asterias Biotherapeutics, Inc. at December 31, 2016 and 2015, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2016, in conformity with accounting principles generally accepted in the United States of America.

As discussed in Note 10 to the financial statements, in 2016 the Company changed the classification of deferred taxes in the balance sheets due to the adoption of ASU 2015-17, *Balance Sheet Classification of Deferred Taxes*. This change was applied retrospectively to all periods presented.

*/s/ OUM & CO. LLP*

San Francisco, California
March 28, 2017

**ASTERIAS BIOTHERAPEUTICS, INC.**
**BALANCE SHEET**
**(IN THOUSANDS EXCEPT PAR VALUE AMOUNTS)**

| | December 31, 2016 | December 31, 2015 (see Note 10) |
|---|---|---|
| **ASSETS** | | |
| CURRENT ASSETS | | |
| Cash and cash equivalents | $ 19,800 | $ 11,183 |
| Available-for-sale securities, at fair value | 15,269 | 17,006 |
| Landlord receivable | - | 567 |
| Prepaid expenses and other current assets | 1,921 | 1,033 |
| Total current assets | 36,990 | 29,789 |
| NONCURRENT ASSETS | | |
| Intangible assets, net | 18,130 | 20,816 |
| Property, plant and equipment, net | 5,475 | 5,756 |
| Investment in affiliates | - | 416 |
| Other assets | 415 | 457 |
| TOTAL ASSETS | $ 61,010 | $ 57,234 |
| **LIABILITIES AND STOCKHOLDERS' EQUITY** | | |
| CURRENT LIABILITIES | | |
| Amount due to BioTime, Inc. | $ 288 | $ 530 |
| Accounts payable | 1,076 | 747 |
| Accrued expenses | 2,495 | 1,183 |
| Capital lease liability, current | 7 | 7 |
| Deferred grant income | 2,185 | 2,513 |
| Total current liabilities | 6,051 | 4,980 |
| LONG-TERM LIABILITIES | | |
| Warrant liability | 8,665 | - |
| Capital lease liability, noncurrent | 20 | 26 |
| Deferred tax liabilities, net | - | 2,550 |
| Deferred rent liability | 266 | 179 |
| Lease liability | 3,980 | 4,400 |
| TOTAL LIABILITIES | 18,982 | 12,135 |
| Commitments and contingencies (see Note 8) | | |
| STOCKHOLDERS' EQUITY | | |
| Preferred Stock, $0.0001 par value, authorized 5,000 shares; none issued and outstanding | - | - |
| Common Stock, $0.0001 par value, authorized 75,000 Series A Common Stock and 75,000 Series B Common Stock; 47,567 and 38,228 shares Series A Common Stock issued and outstanding at December 31, 2016 and 2015, respectively; no Series B Common Stock issued and outstanding at December 31, 2016 and 2015 | 5 | 4 |
| Additional paid-in capital | 126,829 | 92,900 |
| Accumulated other comprehensive income (loss) | (1,078) | 434 |
| Accumulated deficit | (83,728) | (48,239) |
| Total stockholders' equity | 42,028 | 45,099 |
| TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY | $ 61,010 | $ 57,234 |

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

**ASTERIAS BIOTHERAPEUTICS, INC.**
**STATEMENTS OF OPERATIONS**
**(IN THOUSANDS, EXCEPT PER SHARE DATA)**

| | Year Ended December 31, 2016 | 2015 | 2014 |
|---|---|---|---|
| **REVENUES:** | | | |
| Grant income | $ 6,572 | $ 3,007 | $ 1,035 |
| Sale of cell lines | - | 40 | - |
| License revenue | 125 | - | - |
| Royalties from product sales | 257 | 535 | 189 |
| Total revenues | 6,954 | 3,582 | 1,224 |
| Cost of sales | (128) | (268) | (95) |
| Total gross profit | 6,826 | 3,314 | 1,129 |
| **OPERATING EXPENSES:** | | | |
| Research and development | (25,467) | (17,321) | (13,310) |
| General and administrative | (15,482) | (7,901) | (5,280) |
| Total operating expenses | (40,949) | (25,222) | (18,590) |
| Loss from operations | (34,123) | (21,908) | (17,461) |
| **OTHER INCOME/(EXPENSES):** | | | |
| Loss from change in fair value of warrant liability | (3,108) | - | - |
| Interest expense, net | (546) | (341) | (10) |
| Other expense, net | (37) | (6) | (2) |
| Total other expenses, net | (3,691) | (347) | (12) |
| LOSS BEFORE INCOME TAX BENEFIT | (37,814) | (22,255) | (17,473) |
| Deferred income tax benefit | 2,325 | 7,252 | 7,376 |
| **NET LOSS** | $ (35,489) | $ (15,003) | $ (10,097) |
| BASIC AND DILUTED NET LOSS PER SHARE | $ (0.83) | $ (0.42) | $ (0.33) |
| WEIGHTED AVERAGE SHARES OUTSTANDING: BASIC AND DILUTED | 42,934 | 35,443 | 30,720 |

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

**ASTERIAS BIOTHERAPEUTICS, INC.**
**STATEMENTS OF COMPREHENSIVE LOSS**
**(IN THOUSANDS)**

| | Years Ended December 31, | | |
|---|---|---|---|
| | **2016** | **2015** | **2014** |
| **NET LOSS** | $ (35,489) | $ (15,003) | $ (10,097) |
| Other comprehensive income (loss), net of tax: | | | |
| Unrealized gain/(loss) on available for sale securities, net of taxes | (1,512) | 937 | 2,432 |
| **COMPREHENSIVE LOSS** | $ (37,001) | $ (14,066) | $ (7,665) |

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

# ASTERIAS BIOTHERAPEUTICS, INC.
# STATEMENT OF STOCKHOLDERS' EQUITY
# (IN THOUSANDS)

| | Common Stock | | | | Additional | Accumulated Other Comprehensive | | |
|---|---|---|---|---|---|---|---|---|
| | Series A | | Series B | | Paid-In | Income | Accumulated | Stockholders' |
| | Shares | Amount | Shares | Amount | Capital | (Loss) | Deficit | Equity |
| Balance as of December 31, 2013 | 6,538 | $ 1 | 23,961 | $ 2 | $ 79,851 | $ (2,935) | $ (23,139) | $ 53,780 |
| Common stock issued to officer at $2.34 per share | — | — | 200 | — | 468 | — | — | 468 |
| Sale of BioTime shares | — | — | — | — | (10,366) | — | — | (10,366) |
| Stock-based compensation expense | — | — | — | — | 1,580 | — | — | 1,580 |
| Restricted stock granted for compensation at $2.34 per share | — | — | 200 | — | 234 | — | — | 234 |
| Warrants issued to outside investors as part of the sale of 5,000,000 BioTime shares | — | — | — | — | 3,184 | — | — | 3,184 |
| Series B converted to Series A on October 3, 2014 | 24,361 | 2 | (24,361) | (2) | — | — | — | — |
| Issuance of common stock upon exercise of stock options | 3 | — | — | — | 8 | — | — | 8 |
| Deferred tax liability adjustment on BioTime shares | — | — | — | — | (8,592) | — | — | (8,592) |
| Unrealized gain on available-for-sale securities, net of taxes | — | — | — | — | — | 2,432 | — | 2,432 |
| Net loss | — | — | — | — | — | — | (10,097) | (10,097) |
| Balance as of December 31, 2014 | 30,902 | 3 | — | — | 66,367 | (503) | (33,236) | 32,631 |
| Stock-based compensation | 145 | — | — | — | 3,625 | — | — | 3,625 |
| Shares retired to pay employee taxes | (24) | — | — | — | (98) | — | — | (98) |
| Unrealized gain on available-for-sale securities, net of deferred tax liability | — | — | — | — | — | 937 | — | 937 |
| Sale of common stock under at-the-market transactions | 686 | — | — | — | 4,839 | — | — | 4,839 |
| Financing costs to issue common stock | — | — | — | — | (665) | — | — | (665) |
| Issuance of common stock upon exercise of warrants | 5,000 | 1 | — | — | 11,700 | — | — | 11,701 |
| Common stock issued at Private Placement | 1,026 | — | — | — | 4,000 | — | — | 4,000 |
| Common stock issued in public offering | 385 | — | — | — | 1,500 | — | — | 1,500 |
| Issuance of common stock upon exercise of stock options | 12 | — | — | — | 29 | — | — | 29 |
| OncoCyte common stock received as a dividend from BioTime, net of taxes | — | — | — | — | 1,117 | — | — | 1,117 |
| Common stock issued for services | 96 | — | — | — | 486 | — | — | 486 |
| Net loss | — | — | — | — | — | — | (15,003) | (15,003) |
| Balance as of December 31, 2015 | 38,228 | 4 | — | — | 92,900 | 434 | (48,239) | 45,099 |
| Stock-based compensation | 557 | — | — | — | 4,797 | — | — | 4,797 |
| Shares retired to pay employee taxes | (37) | — | — | — | (168) | — | — | (168) |
| Unrealized loss on available-for-sale securities, net of taxes | — | — | — | — | — | (1,512) | — | (1,512) |
| Sale of common stock under at-the-market transactions | 1,812 | — | — | — | 7,969 | — | — | 7,969 |
| Financing costs for at-the-market sales | — | — | — | — | (328) | — | — | (328) |
| Issuance of common stock upon exercise of stock options | 827 | — | — | — | 2,026 | — | — | 2,026 |
| Issuance of common stock upon exercise of warrants, including fair value of warrants | 148 | — | — | — | 1,102 | — | — | 1,102 |
| Issuance of common stock in public offering | 5,889 | 1 | — | — | 14,014 | — | — | 14,015 |
| Financing costs of public offering | — | — | — | — | (1,275) | — | — | (1,275) |
| Distribution of warrants to shareholders other than BioTime | — | — | — | — | 5,285 | — | — | 5,285 |
| Common stock issued for services | 219 | — | — | — | 922 | — | — | 922 |
| Cross-License and Share Transfer with BioTime, net | (76) | — | — | — | (415) | — | — | (415) |
| Net loss | — | — | — | — | — | — | (35,489) | (35,489) |
| Balance as of December 31, 2016 | 47,567 | $ 5 | — | $ — | $ 126,829 | $ (1,078) | $ (83,728) | $ 42,028 |

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

**ASTERIAS BIOTHERAPEUTICS, INC.**
**STATEMENTS OF CASH FLOWS**
**(IN THOUSANDS)**

| | Year Ended December 31, 2016 | 2015 | 2014 |
|---|---|---|---|
| **CASH FLOWS FROM OPERATING ACTIVITIES:** | | | |
| Net loss | $ (35,489) | $ (15,003) | $ (10,097) |
| **Adjustments to reconcile net loss to net cash used in operating activities:** | | | |
| Depreciation and amortization expense | 1,176 | 564 | 530 |
| Stock-based compensation | 4,797 | 3,625 | 1,814 |
| Amortization of intangible assets | 2,686 | 2,686 | 4,789 |
| Amortization of prepaid rent | - | 85 | 85 |
| Deferred income tax benefit | (2,325) | (7,252) | (7,376) |
| Common stock issued for services in lieu of cash | 922 | 486 | - |
| Loss from change in fair value of warrant liability | 3,108 | - | - |
| Distribution of Asterias warrants to shareholders other than BioTime | 5,285 | - | - |
| **Changes in operating assets and liabilities:** | | | |
| Grant receivable | - | 118 | (118) |
| Prepaid expenses and other current assets | (887) | (680) | (182) |
| Other assets | 10 | (95) | - |
| Accounts payable | 329 | (24) | 120 |
| Accrued expenses | 1,863 | 584 | 199 |
| Deferred rent liability | 87 | 85 | 94 |
| Deferred grant income | (328) | 2,513 | - |
| Amount due to BioTime | (242) | (85) | (1,449) |
| Net cash used in operating activities | (19,008) | (12,393) | (11,591) |
| **CASH FLOWS FROM INVESTING ACTIVITIES:** | | | |
| Purchase of property, plant and equipment, including leasehold improvements | (894) | (313) | (115) |
| Payments on construction in progress | - | (4,279) | (219) |
| Proceeds from the sale of available-for-sale investments | - | - | 12,661 |
| Reimbursement (payment) of security deposit, net | 31 | (1) | (307) |
| Net cash provided by/(used in) investing activities | (863) | (4,593) | 12,020 |
| **CASH FLOWS FROM FINANCING ACTIVITIES:** | | | |
| Proceeds from sale of common shares under at-the-market transactions | 7,969 | 4,839 | - |
| Financing costs for at-the-market sales | (328) | (157) | - |
| Proceeds from sale of common shares in public offering | 14,014 | 5,500 | 468 |
| Proceeds allocated to warrants classified as liabilities | 6,009 | - | - |
| Proceeds from exercise of warrants | 651 | 11,700 | - |
| Financing costs for sale of common stock in public offering | (1,275) | (508) | - |
| Financing costs allocated to warrants classified as liabilities | (550) | - | - |
| Proceeds from exercises of stock options | 2,026 | 29 | 8 |
| Repayment of lease liability and capital lease obligation | (427) | (1) | - |
| Shares retired to pay for employees' taxes | (168) | (98) | - |
| Reimbursement from landlord on construction in progress | 567 | 3,789 | - |
| Net cash provided by financing activities | 28,488 | 25,093 | 476 |
| **NET INCREASE IN CASH AND CASH EQUIVALENTS** | 8,617 | 8,107 | 905 |
| At beginning of year | 11,183 | 3,076 | 2,171 |
| At end of year | $ 19,800 | $ 11,183 | $ 3,076 |
| **SUPPLEMENTAL SCHEDULE OF NON-CASH FINANCING AND INVESTING ACTIVITIES:** | | | |
| OncoCyte common stock received as a dividend in kind from BioTime, net of taxes | $ - | $ 1,117 | $ - |
| Construction in progress in accounts payable and accrued expenses | $ - | $ - | $ 186 |
| Landlord receivable | $ - | $ (189) | $ (378) |
| Lease liability | $ - | $ 189 | $ 378 |
| Cross-License and Share Transfer with BioTime Inc., net | $ 415 | $ - | $ - |

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

## ASTERIAS BIOTHERAPEUTICS, INC.
## NOTES TO FINANCIAL STATEMENTS

### 1. Organization, Basis of Presentation and Liquidity

Asterias Biotherapeutics, Inc. (“Asterias”) was incorporated in Delaware on September 24, 2012. Prior to May 13, 2016, Asterias was a majority-owned and controlled subsidiary of BioTime, Inc. (“BioTime”). As further discussed below, on May 13, 2016, BioTime deconsolidated Asterias’ financial statements due to BioTime’s loss of control of Asterias as defined by generally accepted accounting principles.

Asterias is a biotechnology company focused on the emerging fields of cell therapy and regenerative medicine. Asterias has 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 a type of cell called “dendritic cells” used to teach cancer patients’ immune systems to attack their tumors. Asterias currently has 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 (“SCI”); AST-VAC1 is a patient-specific cancer immunotherapy for Acute Myeloid Leukemia (“AML”); and AST-VAC 2 is a non-patient specific cancer immunotherapy for which the initiation of a Phase 1/2a clinical trial in non-small cell lung cancer is planned for 2017.

The financial statements and the notes thereto are presented in accordance with accounting principles generally accepted in the U.S. (“GAAP”) and with the accounting and reporting requirements to Form 10-K and Article 10 of Regulation S-X of the Securities and Exchange Commission (“SEC”).

Prior to May 13, 2016, BioTime consolidated the results of Asterias into BioTime’s consolidated results based on BioTime’s ability to control Asterias’ operating and financial decisions and policies through a majority ownership of Asterias common stock. On May 13, 2016, Asterias completed the sale and the underwriters’ exercise of the overallotment for 5,889,480 shares of its common stock and warrants to purchase 2,959,559 shares of its common stock, through an underwritten public offering (the “Asterias Offering”) (see Note 6). BioTime did not participate in the Asterias Offering. As a result of the sale of Asterias common stock in the Asterias Offering and the issuance of 708,333 shares of Asterias common stock upon the exercise of certain stock options by a former Asterias executive, BioTime’s percentage ownership of the outstanding common stock of Asterias declined to less than 50% on May 13, 2016. Under generally accepted accounting principles, loss of control of a subsidiary is deemed to have occurred when, among other things, a parent company owns less than a majority of the outstanding shares of common stock of the subsidiary, lacks a controlling financial interest in the subsidiary, and is unable to unilaterally control the subsidiary through other means such as having, or having the ability to obtain, a majority of the subsidiary’s Board of Directors. BioTime determined that all of these loss of control factors were present for BioTime as of May 13, 2016. Accordingly, BioTime deconsolidated Asterias’ financial statements and results of operations from those of BioTime, effective May 13, 2016, in accordance with ASC, 810-10-40-4(c), *Consolidation*.

BioTime continues to allocate expenses such as salaries and payroll related expenses incurred and paid on behalf of Asterias based on the amount of time that particular employees of BioTime devote to Asterias affairs. Other expenses such as legal, accounting, travel, and entertainment expenses are allocated to Asterias to the extent that those expenses are incurred by or on behalf of Asterias. BioTime also allocates certain overhead expenses such as insurance, internet, and telephone expenses based on a percentage determined by management. These allocations are made based upon activity-based allocation drivers such as time spent, percentage of square feet of office or laboratory space used, if applicable, and percentage of personnel devoted to Asterias operations or management. These allocated and overhead expenses have decreased during the second half of 2016 and are expected to decrease further in 2017 as Asterias continues to hire its operations and management personnel. Management evaluates the appropriateness of the percentage allocations on a quarterly basis and believes that this basis for allocation is reasonable.

In connection with the services performed by employees of BioTime, or employees of other BioTime commonly controlled and consolidated subsidiaries within the BioTime group of affiliated entities, Asterias has in the past granted stock options to those performing services for Asterias, for which Asterias records stock-based compensation expense in its statements of operations for such services performed in the relevant periods (see Note 9).

*Liquidity* – Since inception, Asterias has incurred operating losses and has funded its operations primarily through issuance of equity securities, warrants, payments from research grants, and royalties from product sales, and the support from BioTime. At December 31, 2016, Asterias had an accumulated deficit of $83.7 million, working capital of $30.9 million and stockholders’ equity of $42.0 million. Asterias has evaluated its projected cash flows and believes that its cash and cash equivalents of $19.8 million and available for sale securities of $15.3 million as of December 31, 2016, will be sufficient to fund Asterias’ operations through at least twelve months from the issuance date of these financial statements, or at least through March 31, 2018 (see Note 16). Some of the clinical trials being conducted by Asterias will continue to be funded in part with funds from the $14.3 million grant awarded in 2014 by the California Institute for Regenerative Medicine (“CIRM”) ($1.5 million of which are still subject to meeting certain milestones as of December 31, 2016) and not from cash on hand, and the value of our available for sale securities is subject to market risk. If Asterias were unable to obtain the remaining grant funding from CIRM, the value of its available for sale securities decreases, or it is unable to obtain future adequate financing for its clinical trials, it may be required to delay, postpone, or cancel its clinical trials or limit the number of clinical trial sites, or otherwise reduce or curtail its operations. Future financings, if necessary, may not be available to Asterias at acceptable terms, or if at all. Sales of additional equity securities would result in the dilution of interests of current shareholders.

**2. Summary of Significant Accounting Policies**

*Use of estimates* – The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period with consideration given to materiality. Significant estimates and assumptions used include those related to the going concern assessment of our financial statements, useful lives associated with long-lived assets, including evaluation of asset impairment, loss contingencies, deferred income taxes and tax reserves, including valuation allowances related to deferred income taxes, and assumptions used to value stock-based awards, liability or other equity instruments. Actual results could differ materially from those estimates.

*Going concern assessment* – With the implementation of FASB's new standard on going concern, ASU No. 2014-15, beginning with the year ended December 31, 2016 and all annual and interim periods thereafter, Asterias will assess going concern uncertainty for its financial statements to determine if Asterias has sufficient cash and cash equivalents on hand and working capital to operate for a period of at least one year from the date the financial statements are issued or are available to be issued, which is referred to as the "look-forward period" as defined by ASU No. 2014-15. As part of this assessment, based on conditions that are known and reasonably knowable to Asterias, Asterias will consider various scenarios, forecasts, projections, and estimates, and Asterias will make certain key assumptions, including the timing and nature of projected cash expenditures or programs, and its ability to delay or curtail those expenditures or programs, among other factors, if necessary, within the look-forward period in accordance with ASU No. 2014-15.

*Revenue recognition* – Asterias complies with ASC 605-10 and records revenue when persuasive evidence of an arrangement exists, delivery has occurred or services have been rendered, the price is fixed or determinable, and collectability is reasonably assured. Grant income is recognized as revenue when the related research and development expenses are incurred. Royalty revenues consist of royalty payments on sales of products under license agreements. Asterias recognizes revenue in the quarter in which the royalty reports are received rather than the quarter in which the sales took place. When Asterias is entitled to receive up-front nonrefundable licensing or similar fees pursuant to agreements under which Asterias has no continuing performance obligations, the fees are recognized as revenues when collection is reasonably assured. When Asterias receives up-front nonrefundable licensing or similar fees pursuant to agreements under which Asterias does have continuing performance obligations, the fees are deferred and amortized ratably over the performance period. If the performance period cannot be reasonably estimated, Asterias amortizes nonrefundable fees over the life of the contract until such time that the performance period can be more reasonably estimated. Milestone payments, if any, related to scientific or technical achievements, subject to substantial uncertainty, are recognized in income when the milestone is accomplished if (a) substantive effort was required to achieve the milestone, (b) the amount of the milestone payment appears reasonably commensurate with the effort expended, and (c) collection of the payment is reasonably assured.

*Cash and cash equivalents* – Asterias considers all highly liquid investments purchased with an original maturity of three months or less to be cash equivalents. As of December 31, 2016 and 2015, Asterias had $13.7 million and $10.0 million in money market funds, respectively, considered to be cash equivalents.

*Concentrations of credit risk* – Financial instruments that potentially subject Asterias to significant concentrations of credit risk consist primarily of cash and cash equivalents. Asterias limits the amount of credit exposure of cash balances by maintaining its accounts in high credit quality financial institutions. Cash equivalent deposits with financial institutions may occasionally exceed the limits of insurance on bank deposits; however, Asterias has not experienced any losses on such accounts.

*Comprehensive income/loss* – ASC 220, *Comprehensive Income*, requires that an entity's change in equity or net assets during a period from transactions and other events from non-owner sources be reported. Asterias reports unrealized gains and losses on its available-for-sale securities as other comprehensive income/(loss).

*Available-for-sale securities, at fair value* – Marketable equity and debt securities not classified as held-to-maturity are classified as available-for-sale. Available-for-sale securities are carried at fair value, with the unrealized gains and losses, net of tax, reported in other comprehensive income or loss. Realized gains and losses, and declines in value judged to be other-than-temporary related to equity securities, are included in other income/(expense), net.

Asterias accounts for the BioTime and OncoCyte shares it holds as available-for-sale equity securities in accordance with ASC 320-10-25, *Investments-Debt and Equity Securities*, as the shares have a readily determinable fair value quoted on the NYSE MKT and are held principally for future working capital purposes, as necessary. These shares are measured at fair value and reported as current assets on the balance sheet based on the closing trading price of the security as of the date being presented (see Note 4). Unrealized holding gains and losses are excluded from the statements of operations and reported in equity as part of other comprehensive income or loss until realized.

Realized gains and losses on the sale of BioTime shares prior to May 13, 2016, were reclassified out of other comprehensive income or loss and included in equity, as an increase or decrease in additional paid-in capital consistent with, and pursuant to, ASC 805-50, *Transactions Between Entities Under Common Control*. Beginning on May 13, 2016, due to the deconsolidation of Asterias financial statements from BioTime and loss of control experienced by BioTime on Asterias, as discussed in Note 1, realized gains and losses, and declines in value judged to be other-than-temporary related to equity securities, are included in other income/(expense), net. For OncoCyte shares that Asterias holds, realized gains and losses, and declines in value judged to be other-than-temporary related to equity securities, are included in other income/(expense), net.

Asterias reviews various factors in determining whether it should recognize an other-than-temporary impairment charge for its available-for-sale securities, including its intent and ability to hold the investment for a period of time sufficient for any anticipated recovery in market value, and the length of time and extent to which the fair value has been less than its cost basis. Based on consideration of these factors, as of December 31, 2016 and 2015, no other-than-temporary impairment loss was recognized.

*Property, plant and equipment* – Property, plant and equipment includes equipment, fixtures and leasehold improvements stated at cost. Depreciation is calculated using the straight-line method over a period of their estimated useful lives ranging from 36 to 120 months. Leasehold improvements are amortized using the shorter of the useful life or the lease term.

*Long-lived intangible assets* – Long-lived intangible assets, consisting primarily of acquired patents, patent applications, and licenses to use certain patents are stated at acquired cost, less accumulated amortization. Amortization expense is computed using the straight-line method over the estimated useful lives of the assets, generally over 10 years.

*Impairment of long-lived assets* – Long-lived assets, including long-lived intangible assets, will be reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount of an asset may not be fully recoverable. If an impairment indicator is present, Asterias evaluates recoverability by a comparison of the carrying amount of the assets to future undiscounted net cash flows expected to be generated by the assets. If the assets are impaired, the impairment will be recognized and measured by the amount by which the carrying amount exceeds the estimated fair value of the assets.

*Accounting for warrants* – Asterias determines the accounting classification of warrants that it issues, as either liability or equity, by first assessing whether the warrants meet liability classification in accordance with ASC 480-10, *Accounting for Certain Financial Instruments with Characteristics of both Liabilities and Equity*, and then in accordance with ASC 815-40, *Accounting for Derivative Financial Instruments Indexed to, and Potentially Settled in, a Company's Own Stock*. Under ASC 480, warrants are considered liability classified if the warrants are mandatorily redeemable, obligate the issuer to settle the warrants or the underlying shares by paying cash or other assets, or warrants that must or may require settlement by issuing variable number of shares. If warrants do not meet liability classification under ASC 480-10, Asterias assesses the requirements under ASC 815-40, which states that contracts that require or may require the issuer to settle the contract for cash are liabilities recorded at fair value, irrespective of the likelihood of the transaction occurring that triggers the net cash settlement feature. If the warrants do not require liability classification under ASC 815-40, in order to conclude equity classification, Asterias assesses whether the warrants are indexed to its common stock and whether the warrants are classified as equity under ASC 815-40 or other applicable GAAP. After all relevant assessments are made, Asterias concludes whether the warrants are classified as liability or equity. Liability classified warrants are required to be accounted for at fair value both on the date of issuance and on subsequent accounting period ending dates, with all changes in fair value after the issuance date recorded in the statements of operations as a gain or loss. Equity classified warrants are accounted for at fair value on the issuance date with no changes in fair value recognized subsequent to the issuance date.

Asterias has issued warrants that are classified as equity and as a liability (see Note 6).

*Research and development* – Research and development expenses consist of costs incurred for company-sponsored, collaborative and contracted research and development activities. These costs include direct and research-related overhead expenses including salaries, payroll taxes, consulting fees, research and laboratory fees, rent of research facilities, amortization of intangible assets, patent applications and prosecutions and license fees paid to third parties to acquire patents or licenses to use patents and other technology. Asterias expenses research and development costs as incurred. Research and development expenses incurred and reimbursed under grants approximate the grant income recognized in the statements of operations.

*General and administrative* – General and administrative expenses consist of compensation and related benefits, including stock-based compensation, for executive and corporate personnel; professional and consulting fees; and allocated overhead. General and administrative expenses also include costs allocated from BioTime pursuant to the Shared Facilities and Services Agreement (see Note 9).

*Income taxes* – As of October 1, 2013, Asterias has filed its own U.S. federal tax returns. Operations prior to that period were included in BioTime's consolidated U.S. federal tax return. For California purposes Asterias' activity through May 12, 2016 was included in BioTime's combined tax return. Activity from May 13, 2016 on will be included in Asterias' separate California income tax return filing due to the deconsolidation of Asterias from BioTime as of that date. Asterias accounts for income taxes in accordance with ASC 740, *Income Taxes*, which prescribes the use of the asset and liability method, whereby deferred tax asset or liability account balances are calculated at the balance sheet date using current tax laws and rates in effect. Valuation allowances are established when necessary to reduce deferred tax assets when it is more likely than not that a portion or all of the deferred tax assets will not be realized. The guidance also prescribes a recognition threshold and a measurement attribute for the financial statement recognition and measurement of tax positions taken or expected to be taken in a tax return. For those benefits to be recognized, a tax position must be more-likely-than-not sustainable upon examination by taxing authorities. For federal purposes Asterias is no longer subject to tax examination for years before 2013. For California purposes Asterias is subject to income tax examinations by tax authorities for all years since inception. Although the statute is closed for purposes of assessing additional income and tax in those years, the taxing authorities may still make adjustments to the net operating loss and credit carryforwards used in open years. Therefore, the statute should be considered open as it relates to the net operating loss and credit carryforwards. Asterias will recognize accrued interest and penalties related to unrecognized tax benefits as income tax expense. No amounts were accrued for the payment of interest and penalties as of December 31, 2016 and 2015.

As further discussed in Note 10, Asterias adopted early the provisions of Accounting Standards Update, ASU 2015-17, *Income Taxes (Topic 740): Balance Sheet Classification of Deferred Taxes*, on a retrospective basis.

*Stock-based compensation* – Asterias accounts for share-based payments in accordance with ASC 718, *Compensation – Stock Compensation,* which require the measurement and recognition of compensation expense for all share-based payment awards made to directors and employees, including employee stock options, based on estimated fair values less estimated forfeitures. Consistent with those guidelines, Asterias utilizes the Black-Scholes-Merton option pricing model. Asterias' determination of fair value of share-based payment awards on the date of grant using that option-pricing model is affected by Asterias' stock price as well as by assumptions regarding a number of complex and subjective variables. These variables include, but are not limited to, Asterias' expected stock price volatility over the term of the awards; the expected term of options granted; and a risk-free rate based on the U.S. Treasury rates in effect during the corresponding expected term of the grant. Expected term is derived from a combination of Asterias own, historical experience, to the extent available, and using the simplified method under SEC *Staff* Accounting *Bulletin* Topic 14, as applicable. Asterias recognizes stock-based compensation on a straight-line basis, net of estimated forfeitures, over the requisite service period.

Asterias also, at times, issues restricted stock or restricted stock units (RSUs) to its executive officers, employees, and members of its Board of Directors, which are restricted and unvested common shares issued or shares issuable as RSUs vest. Restricted stock and RSU compensation expense is recognized on a straight-line basis over the requisite service period of generally four years, based on the grant-date fair value of the stock. Restricted stock is considered legally issued and outstanding on the grant date, while RSUs are not until RSUs vest. Once the RSUs are vested, equivalent common shares will be issued or issuable to the grantee and therefore the RSUs are not included in total common shares issued and outstanding until vested.

Stock-based compensation expense for non-employee stock-based awards is recognized in accordance with ASC 718 and ASC 505-50, *Equity-Based Payments to Non-Employees* ("ASC 505-50"). Stock option awards issued to non-employees, principally consultants and employees of BioTime or employees of BioTime subsidiaries who perform services for Asterias, are accounted for at fair value using the Black-Scholes-Merton option pricing model. Management believes that the fair value of the stock options is more reliably measured than the fair value of services received. Asterias records compensation expense based on the then-current fair values of the stock options at each financial reporting date. Compensation expense recorded during the service period is adjusted in subsequent periods for changes in the fair value of the stock options until the earlier of the date at which the non-employee's performance is complete or a performance commitment is reached, which is generally when the stock option award vests. Compensation expense for non-employee grants is recorded on a straight-line basis in the statements of operations.

*Fair value of financial instruments* – ASC 820*, Fair Value Measurements*, clarifies that fair value is an exit price, representing the amount that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants. As such, fair value is a market-based measurement that should be determined based on assumptions that market participants would use in pricing an asset or liability.

ASC 820 requires that the valuation techniques used to measure fair value must maximize the use of observable inputs and minimize the use of unobservable inputs. ASC 820 establishes a three tier value hierarchy, which prioritizes inputs that may be used to measure fair value as follows:

- Level 1– Observable inputs that reflect quoted prices for identical assets or liabilities in active markets.
- Level 2– Observable inputs other than Level 1 prices, such as quoted prices for similar assets or liabilities; quoted prices in markets that are not active; or other inputs that are observable or can be corroborated by observable market data for substantially the full term of the assets or liabilities.
- Level 3– Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

The carrying amounts of current assets and current liabilities approximate their fair value because of the relatively short period until they mature or are required to be settled, except for money market funds and the investment in BioTime and OncoCyte shares, which are carried at fair value based on Level 1 inputs, and warrant liability which is carried at fair value based on Level 3 inputs (see Note 6).

The following table shows the activity in warrants classified as a liability discussed in Note 6 (in thousands):

| | Warrant Liability | Warrant Shares |
|---|---|---|
| Fair value of warrants issued on May 13, 2016 | $ 6,009 | 2,959 |
| Fair value of warrants exercised on December 2, 2016 | (452) | (146) |
| Increase in fair value of warrants during 2016 | 3,108 | - |
| Fair value of warrants at December 31, 2016 | $ 8,665 | 2,813 |

*Basic and diluted net loss per share* – Basic net loss per share is computed by dividing net loss by the weighted-average number of shares of common stock outstanding for the year. Diluted net loss per share reflects the weighted-average number of shares of common stock outstanding plus the potential effect of dilutive securities or contracts which are convertible to common stock, such as options and warrants (using the treasury stock method) and shares issuable in future periods, such as restricted stock or RSU awards, except in cases where the effect would be anti-dilutive.

The computations of basic and diluted net loss per share are as follows (in thousands, except per share data):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| Net loss | $(35,489) | $(15,003) | $ (10,097) |
| Weighted average common shares outstanding – basic and diluted | 42,934 | 35,443 | 30,720 |
| Net loss per share – basic and diluted | $ (0.83) | $ (0.42) | $ (0.33) |

The following common stock equivalents were excluded from the computation of diluted net loss per share of common stock for the periods presented because including them would have been antidilutive (in thousands):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| Stock options and restricted stock units | 6,266 | 5,178 | 3,347 |
| Warrants | 6,552 | 3,500 | 8,500 |

*Reclassification*– Certain prior year amounts in the statement of cash flows have been reclassified to conform to the current year presentation. There was no change or impact to total amounts reported in the prior years.

*Recently Issued Accounting Pronouncements* – The following accounting standards, which are not yet effective, are presently being evaluated by Asterias to determine the impact that they might have on its financial statements.

On January 5, 2016, the FASB issued Accounting Standards Update 2016-01, *Financial Instruments–Overall: Recognition and Measurement of Financial Assets and Financial Liabilities* (ASU No. 2016-01). Changes to the current GAAP model primarily affect the accounting for equity investments, financial liabilities under the fair value option, and the presentation and disclosure requirements for financial instruments. In addition, ASU No. 2016-01 clarified guidance related to the valuation allowance assessment when recognizing deferred tax assets resulting from unrealized losses on available-for-sale debt securities. The accounting for other financial instruments, such as loans, investments in debt securities, and financial liabilities is largely unchanged. The more significant amendments are to equity investments in unconsolidated entities.

In accordance with ASU No. 2016-01, all equity investments in unconsolidated entities (other than those accounted for using the equity method of accounting) will generally be measured at fair value through earnings. There will no longer be an available-for-sale classification (changes in fair value reported in other comprehensive income) for equity securities with readily determinable fair values. The classification and measurement guidance will be effective for public business entities in fiscal years beginning after December 15, 2017, including interim periods within those fiscal years. ASU No. 2016-01, when adopted, could have a material impact on Asterias' financial statements based on the current accounting of available-for-sale securities Asterias holds as discussed in Note 4.

In December 2016, FASB issued Accounting Standards Update, ASU, 2016-20, *Technical Corrections and Improvements to Topic 606, Revenue from Contracts with Customers (ASU 2016-20)* which amends narrow aspects of accounting standard ASU 2014-09 *Revenue from Contracts with Customers (Topic 606)*. ASU-2016-20 is effective for periods beginning after December 15, 2017.

In May 2014, the FASB issued ASU 2014-09, *Revenue from Contracts with Customers (Topic 606)*, which supersedes nearly all existing revenue recognition guidance under GAAP. The core principle of ASU 2014-09 is to recognize revenues when promised goods or services are transferred to customers in an amount that reflects the consideration to which an entity expects to be entitled for those goods or services. ASU 2014-09 defines a five-step process to achieve this core principle and, in doing so, more judgments and estimates may be required in the revenue recognition process than are required under existing GAAP. The revised revenue standard is effective for public entities for annual periods beginning after December 15, 2017, and interim periods therein, using either of the following transition methods: (i) a full retrospective approach reflecting the application of the standard in each prior reporting period with the option to elect certain practical expedients; or (ii) a retrospective approach with the cumulative effect of initially adopting ASU 2014-09 recognized at the date of adoption (which includes additional footnote disclosures).

Asterias has completed an initial assessment of the new revenue recognition standard under Topic 606, which will be effective for Asterias beginning on January 1, 2018, and Asterias will be working on an implementation plan to evaluate the accounting and disclosure requirements under the new standard. Based on the work performed to date, Asterias does not expect adoption of the new standard to have a material impact on the financial statements. Asterias has not finalized its transition method for adoption.

In March 2016, the FASB issued ASU 2016-09, *Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting,* which simplifies several aspects of the accounting for share-based payment transactions, including the income tax consequences, forfeitures, classification of awards as either equity or liabilities, and classification of awards on the statement of cash flows. The update is effective for fiscal years beginning after December 15, 2016, and interim periods within those annual periods. Asterias is currently evaluating the impact the adoption of ASU 2016-09 will have on its financial statements.

In February 2016, the FASB issued ASU 2016-02, *Leases (Topic 842),* which requires lessees to recognize assets and liabilities for leases with lease terms greater than twelve months in the statement of financial position. Leases will be classified as either finance or operating, with classification affecting the pattern of expense recognition in the income statement. ASU 2016-02 also requires improved disclosures to help users of financial statements better understand the amount, timing and uncertainty of cash flows arising from leases. The update is effective for fiscal years beginning after December 15, 2018, including interim reporting periods within that reporting period. Early adoption is permitted. Although Asterias has not completed its evaluation of the impact of the adoption of ASU 2016-02, since the significant operating leases Asterias has are currently on its balance sheet (see Note 8), the adoption of ASU 2016-02 is not expected to have a material impact to Asterias financial statements.

**3. Balance Sheet Components**

*Property, plant and equipment, net*

As of December 31, 2016 and 2015, property, plant and equipment, net were comprised of the following (in thousands):

| | December 31, 2016 | December 31, 2015 |
|---|---|---|
| Computers, machinery and equipment | $ 2,545 | $ 1,789 |
| Furniture, fixtures and leasehold improvements | 5,421 | 5,283 |
| | 7,966 | 7,072 |
| Less - accumulated depreciation and amortization | (2,491) | (1,316) |
| Property, plant and equipment, net | $ 5,475 | $ 5,756 |

Depreciation and amortization expense amounted to $1.2 million, $564,000, and $530,000 for the years ended December 31, 2016, 2015 and 2014, respectively.

*Accrued expenses*

As of December 31, 2016 and 2015, accrued expenses were comprised of the following (in thousands):

| | December 31, 2016 | December 31, 2015 |
|---|---|---|
| Accrued compensation and benefits | $ 1,770 | $ 188 |
| Other accrued expenses | 725 | 995 |
| Accrued expenses | $ 2,495 | $ 1,183 |

**4. Investment in BioTime and OncoCyte Common Stock**

*Investment in BioTime Common Stock*

BioTime common shares (traded on NYSE: MKT under the symbol “BTX”) are included at fair value in current assets on the balance sheets as the shares are available for use and could be sold at fair value for working capital purposes. As of December 31, 2016 and 2015, Asterias held 3,852,880 BioTime shares which are valued at $13.9 million and $15.8 million, respectively, based on the closing price on those dates.

*Investment in OncoCyte Common Stock*

On December 31, 2015, in connection with BioTime’s distribution of OncoCyte common stock to BioTime shareholders, on a pro rata basis, Asterias received 192,644 shares of OncoCyte common stock from BioTime as a dividend in kind. On this date, BioTime shareholders, including Asterias, received one share of OncoCyte common stock for every twenty shares of BioTime common stock held. Asterias recorded the fair value of the OncoCyte common stock as contributed capital from BioTime. The OncoCyte common stock distribution resulted in a taxable gain to Asterias of $819,000 (see Note 10).

The OncoCyte shares are included in available-for-sale securities at fair value in current assets in Asterias’ balance sheets as the shares are traded on NYSE: MKT (symbol “OCX”) and available for working capital purposes. As of December 31, 2016 and 2015, the OncoCyte shares are valued at $1.4 million and $1.2 million, respectively, based on the OncoCyte closing price on those dates.

**5. Intangible assets, net**

As of December 31, 2016 and, 2015, Asterias had capitalized intangible assets acquired from Geron Corporation, primarily related to patents and other intellectual property rights related to hES cells. These assets are being amortized over their estimated useful lives of 10 years.

Intangible assets, net at December 31, 2016 and, 2015 are shown in the following table (in thousands):

| | December 31, 2016 | December 31, 2015 |
|---|---|---|
| Intangible assets | $ 26,860 | $ 26,860 |
| Less - accumulated amortization | (8,730) | (6,044) |
| Intangible assets, net | $ 18,130 | $ 20,816 |

Asterias recognized $2.7 million, $2.7 million, and $4.8 million in amortization expense of intangible assets for the years ended December 31, 2016, 2015 and 2014, respectively.

Amortization of intangible assets for periods subsequent to December 31, 2016 is as follows (in thousands):

| Year Ending December 31, | Amortization Expense |
|---|---|
| 2017 | $ 2,686 |
| 2018 | 2,686 |
| 2019 | 2,686 |
| 2020 | 2,686 |
| 2021 | 2,686 |
| Thereafter | 4,700 |
| Total | $18,130 |

**6. Common Stock and Warrants**

At December 31, 2016, Asterias had outstanding 47,566,596 Series A Shares and no Series B Shares. At December 31, 2015, Asterias had outstanding 38,228,120 Series A Shares and no Series B Shares. All outstanding Series B Shares were converted into Series A Shares on October 3, 2014.

*Common Stock Issuance*

On May 13, 2016, Asterias completed the sale and the underwriters’ exercise of the overallotment for 5,889,480 shares of its common stock and warrants to purchase 2,959,559 shares of its common stock, through an underwritten public offering (the “Asterias Offering”), for $3.40 per unit, or net proceeds to Asterias of $18.2 million. Total financing costs were approximately $1.8 million, of which $1.3 million were allocated to the Asterias common stock (see *Warrants classified as liability* below). The net proceeds allocated to the common stock were $12.7 million and the net proceeds allocated to the warrants were $5.5 million.

During the year ended December 31, 2016, Asterias received approximately $7.6 million in net proceeds from at-the-market transactions and issued 1.8 million shares of Asterias common stock.

During the year ended December 31, 2016, Asterias received approximately $2.7 million in net proceeds from exercise of stock options and warrants.

During the year ended December 31, 2015, Asterias raised approximately $5.5 million in aggregate gross proceeds from the sale of 1,410,255 shares of common stock at a price of $3.90 per share through an underwritten public offering and a private placement. Broadwood Partners, L.P., British & American Investment Trust PLC and Pedro Lichtinger, related parties, purchased an aggregate of 1,025,640 of the shares.

On April 10, 2015, Asterias entered into an at-the-market (ATM) Sales Agreement with MLV, pursuant to which Asterias may sell up to a maximum of $20.0 million of its common stock from time to time through MLV under Asterias' previously filed and currently effective shelf registration statement on Form S-3 (File No. 333-200745). During the fiscal year ended December 31, 2016, Asterias raised approximately $8.0 million in gross proceeds under the ATM from the sale of 1,811,522 shares of its common stock at a weighted average price of $4.41 per share. During the fiscal year ended December 31, 2015, Asterias raised approximately $4.8 million in gross proceeds from the sale of 685,465 shares of its common stock at a weighted average price of $7.01 per share. As of December 31, 2016, up to approximately $7.2 million of shares of Asterias common stock are available for issuance and sale pursuant to the terms of the ATM (see Note 16).

During 2016 and 2015, pursuant to a services agreement with Cell Therapy Catapult Services Limited, Asterias had issued 218,520 shares and 94,479 shares, respectively of Asterias Series A common stock with a fair value of $922,000 and $486,000, respectively to pay for services in lieu of cash (see Note 13).

Asterias issued 148,594 shares of common stock pursuant to the exercise of warrants in 2016. Asterias issued 5,000,000 shares of common stock pursuant to the exercise of warrants in 2015.

*Warrants classified as a liability*

On May 13, 2016, included in the Asterias Offering, Asterias issued 2,959,559 warrants (the "Asterias Offering Warrants"). The Asterias Offering Warrants have an exercise price $4.37 per share and expire in five years of the issuance date, or May 13, 2021. The Asterias Offering Warrants also contain certain provisions in the event of a Fundamental Transaction, as defined in the warrant agreement governing the Asterias Offering Warrants ("Warrant Agreement"), that Asterias or any successor entity will be required to purchase, at a holder's option, exercisable at any time concurrently with or within thirty days after the consummation of the fundamental transaction, the Asterias Offering Warrants for cash. This cash settlement will be in an amount equal to the value of the unexercised portion of such holder's warrants, determined in accordance with the Black Scholes-Merton option pricing model as specified in the Warrant Agreement.

In accordance with ASC 815-40, *Accounting for Derivative Financial Instruments Indexed to, and Potentially Settled in, a Company's Own Stock*, contracts that require or may require the issuer to settle the contract for cash are liabilities recorded at fair value, irrespective of the likelihood of the transaction occurring that triggers the net cash settlement feature. Changes to the fair value of those liabilities are recorded in the statements of operations. Accordingly, since Asterias may be required to net cash settle the Asterias Offering Warrants in the event of a Fundamental Transaction; the Asterias Offering Warrants are classified as noncurrent liabilities at fair value, with changes in fair value recorded in other income or expense, net, in the statements of operations.

The fair value of the Asterias Offering Warrants at the time of issuance was determined by using a combination of the Binomial Lattice and Black-Scholes-Merton option pricing models under various probability-weighted outcomes which take into consideration the probability of the fundamental transaction and net cash settlement occurring, using the contractual term of the warrants. In applying these models, the fair value is determined by applying Level 3 inputs, as defined by ASC 820; these inputs have included assumptions around the estimated future stock price of Asterias common stock, volatility and the timing of, and varying probabilities that certain events will occur. The Asterias Offering Warrants are revalued each reporting period using the same methodology described above. Changes in any of the key assumptions used to value the Asterias Offering Warrants could materially impact the fair value of the warrants and Asterias' financial statements.

On May 13, 2016, the fair value of the Asterias Offering Warrants was approximately $6.0 million. Because the Asterias Offering Warrants are accounted for as liabilities, the total proceeds from the Asterias Offering were allocated first entirely to the Asterias Offering Warrants' fair value and the remaining residual proceeds to the Asterias common stock. In addition, of the total $1.8 million of the Asterias Offering discounts and expenses incurred, $0.6 million were allocated to the Asterias Offering Warrants, based on the full fair value of the Asterias Offering Warrants and total gross proceeds, and immediately expensed as general and administrative expenses. Total net proceeds allocated to the Asterias Offering Warrants were $5.5 million.

On December 2, 2016, certain investors exercised 146,400 Asterias Offering Warrants for cash proceeds to Asterias of approximately $640,000 (see Note 2).

At December 31, 2016, based on a valuation performed by Asterias Offering Warrants using the methodology described above, the fair value of the Asterias Offering Warrants liability was \$8.7 million, resulting in Asterias recording an unrealized loss of \$3.1 million for the year ended December 31, 2016, included in other income and expenses, net, in the statements of operations.

*Warrants classified as equity*

On March 30, 2016, Asterias' board of directors declared a distribution of Asterias common stock purchase warrants to all Asterias shareholders other than BioTime, in the ratio of one warrant for every five shares of Asterias common stock owned of record as of the close of business on April 11, 2016. On April 25, 2016, Asterias distributed 3,331,229 warrants (the "Distribution Warrants"). The distribution of the Distribution Warrants was treated as a disproportionate distribution since, in accordance with the terms of the Share Transfer with BioTime, no warrants were distributed to BioTime (see Note 9). The Distribution Warrants are classified as equity, have an exercise price of \$5.00 per share, and were set to expire on September 30, 2016. Asterias recorded the Distribution Warrants at a fair value of approximately \$3.1 million with a noncash charge to shareholder expense included in general and administrative expenses and a corresponding increase to equity as of March 30, 2016 as the Distribution Warrants were deemed to be issued for accounting purposes on that date.

On September 19, 2016, Asterias extended the expiration date of the Distribution Warrants to February 15, 2017, no other terms were changed. As a result of the extension of the expiration date of these warrants, Asterias recorded a \$2.0 million noncash charge to shareholder expense included in general and administrative expenses and a corresponding increase to equity for the year ended December 31, 2016. On February 3, 2017, Asterias extended the expiration date of the Distribution Warrants to September 29, 2017 (see Note 16).

In connection with the warrant distribution to shareholders discussed above, 350,000 warrants with an exercise price of \$5.00 per share held by Romulus Films, Ltd. were adjusted to become exercisable into 409,152 shares at an exercise price of \$4.28 per share (the "Romulus Warrants"). These warrants had an original expiration date of September 30, 2016. On September 19, 2016, Asterias extended the expiration date of the Romulus Warrants to February 15, 2017, no other terms were changed. As a result of the extension of the expiration date of these warrants, Asterias recorded a \$0.2 million noncash charge to shareholder expense included in general and administrative expenses and a corresponding increase to equity for the year ended December 31, 2016. On February 3, 2017, Asterias extended the expiration date of the Romulus Warrants to September 29, 2017 (see Note 16).

*Warrants Outstanding in 2016, 2015 and 2014*

At December 31, 2014, warrants to purchase 8,500,000 common shares with a weighted average exercise price of \$3.44 and a weighted average remaining contractual life of 0.99 years were outstanding. At December 31, 2015, warrants to purchase 3,500,000 common shares with an exercise price of \$5.00 and a weighted average remaining contractual life of 0.75 years were outstanding (see Note 15).

In February 2016, of the warrants to purchase 3,500,000 shares, 3,150,000 were returned to Asterias by BioTime as part of the Share Transfer between Asterias and BioTime (see Note 9). As of March 20, 2016, these warrants to purchase 3,150,000 shares were retired by Asterias. Asterias warrants to purchase common shares outstanding ending December 31, 2016 was 6,552,479.

Activity related to equity and liability classified warrants in 2016 and 2015, is presented in the table below (in thousands, except per share and weighted average exercise prices):

| | Number of Warrants | Per share exercise price | Weighted Average Exercise Price |
|---|---|---|---|
| Outstanding, January 1, 2015 | 8,500 | \$2.34-5.00 | \$ 3.44 |
| Exercised in 2015 | (5,000) | 2.34 | 2.34 |
| Outstanding, December 31, 2015 | 3,500 | \$ 5.00 | \$ 5.00 |
| Issued in 2016 | 6,350 | 4.28-5.00 | 4.69 |
| Exercised in 2016 | (148) | 4.37-5.00 | 4.38 |
| Retired in 2016 | (3,150) | 5.00 | 5.00 |
| Outstanding, December 31, 2016 | 6,552 | \$4.28-5.00 | \$ 4.68 |

**7. Equity Incentive Plan**

During March 2013, Asterias' Board of Directors approved an Equity Incentive Plan (the "Plan") under which Asterias has reserved 4,500,000 shares of common stock for the grant of stock options or the sale of restricted stock. Initially, Asterias issued Series B Shares under the Plan. Since the date on which all of the outstanding Series B Shares were converted into Series A Shares, Asterias has issued Series A Shares under the Plan. The Plan also permits Asterias to issue such other securities as its Board of Directors or the Compensation Committee administering the Plan may determine. Asterias' stockholders approved the Plan in September 2013.

During May 2015, Asterias' Board of Directors approved an amendment that would increase the number shares authorized for issuance under the Plan by 3,500,000 shares. This amendment was approved by the shareholders at the 2015 annual meeting of shareholders held on July 9, 2015.

During May 2016, Asterias' Board of Directors approved an amendment to increase the number of shares authorized for issuance under the Plan by 3,000,000 shares. This amendment was approved by the shareholders at the 2016 annual meeting of shareholders held on June 9, 2016.

No options may be granted under the Plan more than ten years after the date upon which the Plan was adopted by the Board of Directors, and no options granted under the Plan may be exercised after the expiration of ten years from the date of grant. Under the Plan, options to purchase common stock may be granted to employees, directors and certain consultants at prices not less than the fair market value at date of grant, subject to certain limited exceptions for options granted in substitution of other options. Options may be fully exercisable immediately, or may be exercisable according to a schedule or conditions specified by the Board of Directors or the Compensation Committee. The Plan also permits Asterias to award restricted stock for services rendered or to sell common stock to employees subject to vesting provisions under restricted stock agreements that provide for forfeiture of unvested shares upon the occurrence of specified events under a restricted stock award agreement. Asterias may permit employees or consultants, but not officers or directors, who purchase stock under restricted stock purchase agreements, to pay for their shares by delivering a promissory note that is secured by a pledge of their shares.

Asterias may also grant stock appreciation rights ("SARs") and hypothetical units issued with reference to Asterias common stock (restricted stock units or "RSUs") under the Plan. A SAR is the right to receive, upon exercise, an amount payable in cash or shares or a combination of shares and cash, as determined by the Board of Directors or the Compensation Committee, equal to the number of shares subject to the SAR that is being exercised multiplied by the excess of (a) the fair market value of a share of Asterias common stock on the date the SAR is exercised, over (b) the exercise price specified in the SAR Award agreement.

The terms and conditions of a grant of RSUs is determined by the Board of Directors or Compensation Committee. No shares of stock will be issued at the time a RSU is granted, and Asterias will not be required to set aside a fund for the payment of any such award. A recipient of RSUs will have no voting rights with respect to the Restricted Stock Units. Upon the expiration of the restrictions applicable to a RSU, Asterias will either issue to the recipient, without charge, one share of common stock per RSU or cash in an amount equal to the fair market value of one share of common stock.

*Stock Options, Restricted Stock and Restricted Stock Units*

As of December 31, 2016, Asterias had outstanding to certain officers, employees, and directors, options to purchase a total of 6,065,938 shares of common stock at a weighted average exercise price of $3.35 per share and 200,000 restricted stock/RSUs.

A summary of Asterias' Plan activity and related information follows (in thousands, except per share amounts):

| **Stock options** | **Number of Options Outstanding** | **Weighted Average Exercise Price** |
|---|---|---|
| Options outstanding at January 1, 2014 | 2,840 | $ 2.34 |
| Options granted | 1,590 | 2.50 |
| Options exercised | (3) | 2.34 |
| Options expired/forfeited | (1,280) | 2.34 |
| Options outstanding at December 31, 2014 | 3,147 | $ 2.42 |
| Options granted | 2,005 | 3.81 |
| Options exercised | (12) | 2.34 |
| Options forfeited/cancelled | (9) | 3.22 |
| Options outstanding at December 31, 2015 | 5,131 | $ 3.17 |
| Options granted | 3,175 | 3.53 |
| Options exercised | (827) | 2.45 |
| Options forfeited/cancelled | (1,413) | 3.68 |
| Options outstanding at December 31, 2016 | 6,066 | $ 3.35 |
| Options vested and expected to vest at December 31, 2016 | 6,066 | $ 3.35 |
| Options exercisable at December 31, 2016 | 2,683 | $ 3.01 |

The intrinsic value of options exercised was $1.9 million and $0.1 million in 2016 and 2015, respectively. The aggregate intrinsic value of shares vested during 2016 and 2015 was $4.0 million and $2.0 million respectively.

| **Restricted stock and Restricted stock units** | **Number of Shares** | **Weighted Average Remaining Contractual Term** | **Aggregate Intrinsic Value** |
|---|---|---|---|
| Restricted stock/RSUs outstanding at January 1, 2016 | 48 | | |
| Restricted stock/RSUs awarded | 515 | | |
| Restricted stock/RSUs released | (360) | | |
| Restricted stock/RSUs forfeited | (3) | | |
| Restricted stock/RSUs outstanding at December 31, 2016 | 200 | 0.7 | $ 677 |
| Restricted stock/RSUs vested and expected to vest at December 31, 2016 | 200 | 0.7 | $ 677 |

During 2016, the Company awarded 200,000 shares of Restricted Stock and 314,918 Restricted Stock Units. The Restricted Stock vests 50% at the end of 6 months and the remaining 50% vests at end of 12 months. RSU's vests 25% at the end of the first year and monthly thereafter over 3 years. Vested shares are net-share settled such that the Company withholds shares with value equivalent to the employees' minimum statutory obligation for the applicable income and other employment taxes, and remits the cash to the appropriate tax authorities. The aggregate value of Restricted Stock and RSUs vesting during 2016 was $0.4 million and $0.9 million, respectively.

Restricted Stock awarded in 2016 and 2015 had an average grant date fair value per award of $3.64 and $2.34, respectively. The aggregate fair value of Restricted Stock vesting during 2016 and 2015 was $0.4 million and $0.5 million, respectively. The RSUs awarded in 2016 and 2015 had an average grant date fair value per award of $3.57 and $3.90, respectively. The aggregate fair value of RSU's vesting during 2016 and 2015 was $0.9 million and $0.6 million, respectively.

As of December 31, 2016, there were 2,318,821 shares reserved for future awards. Restricted stock and RSUs are counted against the available for grant pool two to one.

*Stock-Based Compensation Expense*

The weighted-average estimated fair value of stock options granted during the years ended December 31, 2016, 2015 and 2014 was $3.53, $2.92, and $1.50 per share respectively, using the Black-Scholes-Merton model with the following weighted-average assumptions:

| | **Years Ended December 31,** | | |
|---|---|---|---|
| | **2016** | **2015** | **2014** |
| Expected life (in years) | $ 5.81 | $ 6.10 | $ 3.98 |
| Risk-free interest rates | 1.37% | 1.74% | 1.31% |
| Volatility | 74.89% | 77.78% | 83.49% |
| Dividend yield | 0% | 0% | 0% |

The risk-free rate is based on the rates in effect at the time of grant for zero coupon U.S. Treasury notes with maturities approximately equal to each grant's expected life. A dividend yield of zero is applied since Asterias has not historically paid dividends and does not expect to pay dividends in the foreseeable future. The expected volatility is based upon the volatility of Asterias' own trading stock and of a group of publicly traded industry peer companies. The expected term of options granted is derived from a combination of Asterias historical experience, to the extent available, and using the simplified method under SEC *Staff Accounting Bulletin* Topic 14.

Stock-based compensation expense is recognized based on awards that are ultimately expected to vest, and as a result, the amount has been reduced by estimated forfeitures. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. Forfeitures are estimated based on Asterias' historical experience and future expectations.

The determination of stock-based compensation is inherently uncertain and subjective and involves the application of valuation models and assumptions requiring the use of judgment. If Asterias had made different assumptions, its stock-based compensation expense, and net loss for years ended December 31, 2016, 2015 and 2014, may have been significantly different.

Asterias does not recognize deferred income taxes for incentive stock option compensation expense, and records a tax deduction only when a disqualified disposition has occurred.

Operating expenses include stock-based compensation expense as follows (in thousands):

| | Year Ended December 31, | | |
|---|---|---|---|
| | 2016 | 2015 | 2014 |
| Research and development | $ 2,655 | $ 1,604 | $ 478 |
| General and administrative | 2,142 | 2,021 | 1,336 |
| Total stock-based compensation expense | $ 4,797 | $ 3,625 | $ 1,814 |

At December 31, 2016 and 2015, Asterias had $7.3 million and $6.7 million, respectively, of total unrecognized compensation expense, net of estimated forfeitures, related to the Plan that will be recognized over a weighted-average period of approximately 3.4 and 2.4 years, respectively.

**8. Commitments and Contingencies**

*Development and Manufacturing Services Agreement*

On August 3, 2016, Asterias 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 is performing under an Initial Statement of Work process development studies in support of Asterias’ clinical and commercial development activities of AST-VAC1 and production and manufacturing services of AST-VAC1 under cGMP under the Second Statement of Work. In consideration for the process development services set forth in the Initial Statement of Work, Asterias agreed to make aggregate payments of up to approximately $1.7 million in fees over the term of the Initial Statement of Work and pay for additional pass through costs for materials and equipment estimated by management to be approximately $0.5 million. In consideration of the production and manufacturing services set forth in the Second Statement of Work, once the services under the Initial Statement of Work are completed and if Asterias receives FDA concurrence on the clinical protocol for an AST-VAC1 trial, then Asterias will make an initial start-up payment, a monthly payment for dedicated manufacturing capacity, and certain other manufacturing fees.

The Services Agreement will expire on the later of (a) August 3, 2019; or (b) the completion of all services contracted for by the parties in the Statements of Work under the Services Agreement prior to August 3, 2019. The term of the Services Agreement and any then pending Statements of Work thereunder may be extended by Asterias continuously for additional two-year periods upon written notice to Cognate at least thirty days prior to the expiration of the then-current term.

The Services Agreement provides certain termination rights to each party and customary provisions relating to indemnity, confidentiality and other matters. Asterias incurred $574,000 of expense payable to Cognate pursuant to the Services Agreement for the year ended December 31, 2016.

*Fremont Lease*

On December 30, 2013, Asterias entered into a lease for an office and research facility located in Fremont, California, consisting of an existing building with approximately 44,000 square feet of space. The building is being used by Asterias as a combined office, laboratory and production facility that can be used to produce hES and related products under current good manufacturing procedures. Asterias completed the tenant improvements in November 2015, which cost approximately $4.9 million, of which the maximum of $4.4 million was paid to Asterias by the landlord. Asterias placed the asset into service in November 2015 and is amortizing the leasehold improvements and the landlord liability over the remaining lease term through September 30, 2022.

As of December 31, 2016 and 2015, the landlord liability was $4.0 million and $4.4 million and the deferred rent liability was $266,000 and $179,000, respectively.

Beginning on January 1, 2016, base rent increased to $105,000 per month and will increase by approximately 3% annually on every October 1 thereafter. On October 1, 2016, the base rent increased to $108,000 per month.

In addition to monthly base rent, Asterias will pay all real estate taxes, insurance and the cost of maintenance, repair and replacement of the leased premises. During the first 15 months of the lease term, Asterias will pay only 50% of the real estate taxes assessed on the premises provided that Asterias is not in default in performing its obligations under the lease beyond any notice and cure periods. However, if any improvements or alterations to the premises that Asterias constructs or adds are assessed for real property tax purposes at a valuation higher than the valuation of the improvements on the premises on the date it signed the lease, Asterias will pay 100% of the taxes levied on the excess assessed valuation.

Asterias is considered the owner of the asset for accounting purposes only under build-to-suit under ASC 840-40-55 as Asterias, among other things, has the primary obligation to pay for construction costs and Asterias will retain exclusive use of the building for its office and research facility requirements after construction is completed. In addition, the lease does not qualify for sale-leaseback accounting under ASC 840-40-25, *Accounting for Leases, Sale-Leaseback Transactions*, due to Asterias' significant continuing involvement with the facility that Asterias considers to be other than a normal leaseback as defined by ASC 840-40-25. In accordance with this guidance, amounts previously expended by Asterias for construction would continue to be reported as construction in progress in Asterias' financial statements, and the landlord reimbursement proceeds received, including amounts earned by Asterias but not yet paid by the landlord at period end, are reported as a lease liability. The property was placed in service in November 2015 and Asterias commenced depreciating the property. Lease payments allocated to the landlord liability are accounted for as debt service payments on that liability using the finance method of accounting per ASC 840-40-55. As of December 31, 2015, Asterias had incurred $4.9 million of construction costs included in property, plant and equipment (see Note 3), of which $4.4 million was the lease liability included in long term liabilities at December 31, 2015. The lease liability is being amortized using the effective interest method.

Total rent expense for all rented facilities for the years ended December 31, 2016, 2015, and 2014 was $0.5 million, $1.0 million and $0.8 million, respectively.

Future minimum annual lease payments, including the lease liability, under the Fremont Lease for the years ending after December 31, 2016 are as follows (in thousands):

| **Year Ending December 31,** | **Minimum Lease Payments** |
|---|---|
| 2017 | $1,309 |
| 2018 | 1,347 |
| 2019 | 1,387 |
| 2020 | 1,430 |
| 2021 | 1,474 |
| Thereafter | 1,130 |
| Total | $8,077 |

*Litigation – General*

Asterias will be subject to various claims and contingencies in the ordinary course of its business, including those related to litigation, business transactions, employee-related matters, and others. When Asterias is aware of a claim or potential claim, it assesses the likelihood of any loss or exposure. If it is probable that a loss will result and the amount of the loss can be reasonably estimated, Asterias will record a liability for the loss. If the loss is not probable or the amount of the loss cannot be reasonably estimated, Asterias discloses the claim if the likelihood of a potential loss is reasonably possible and the amount involved could be material. Asterias is not aware of any claims likely to have a material adverse effect on its financial condition or results of operations.

*Employment Contracts*

Asterias has entered into employment contracts with certain executive officers. Under the provisions of the contracts, Asterias may be required to incur severance obligations for matters relating to changes in control, as defined and involuntary terminations. In 2016, Asterias paid $309,000 in severance to two former executives in accordance with their respective separation agreements.

At December 31, 2016, total potential severance obligations in connection with the termination of employment contracts approximated $960,000 for termination without cause and $1.6 million for termination due to a change in control.

*Indemnification*

In the normal course of business, Asterias may provide indemnifications of varying scope under Asterias' agreements with its directors and executive employees or other companies or consultants, typically Asterias' clinical research organizations, investigators, clinical sites, suppliers and others. Pursuant to these agreements, Asterias will generally agree to indemnify, hold harmless, and reimburse the indemnified parties for losses and expenses suffered or incurred by the indemnified parties arising from claims of third parties in connection with the use or testing of Asterias' products and services. Indemnification provisions could also cover third party infringement claims with respect to patent rights, copyrights, or other intellectual property pertaining to Asterias products and services. The term of these indemnification agreements will generally continue in effect after the termination or expiration of the particular research, development, services, or license agreement to which they relate. The potential future payments Asterias could be required to make under these indemnification agreements will generally not be subject to any specified maximum amount. Historically, Asterias has not been subject to any claims or demands for indemnification. Asterias maintains various liability insurance policies that limit Asterias' exposure. As a result, Asterias believes the fair value of these indemnification agreements is minimal. Accordingly, Asterias has not recorded any liabilities for these agreements as of December 31, 2016 and 2015.

**9. Shared Facilities and Service Agreement**

On April 1, 2013, Asterias and BioTime executed a Shared Facilities and Services Agreement ("Shared Facilities Agreement"). Under the terms of the Shared Facilities Agreement, BioTime will allow Asterias to use its premises and equipment located at Alameda, California for the sole purpose of conducting business. BioTime will provide basic accounting, billing, bookkeeping, payroll, treasury, collection of accounts receivable (excluding the institution of legal proceedings or taking of any other action to collect accounts receivable), payment of accounts payable, and other similar administrative services to Asterias. BioTime may also provide the services of attorneys, accountants, and other professionals who may also provide professional services to BioTime and its other subsidiaries. BioTime will also provide Asterias with the services of its laboratory and research personnel, including BioTime employees and contractors, for the performance of research and development work for Asterias at the premise.

BioTime will charge Asterias a fee for the services and usage of facilities, equipment, and supplies aforementioned. For each billing period, BioTime will equitably prorate and allocate its employee costs, equipment costs, insurance costs, lease costs, professional costs, software costs, supply costs, and utilities costs, between BioTime and Asterias based upon actual documented use and cost by or for Asterias or upon proportionate usage by BioTime and Asterias, as reasonably estimated by BioTime. Asterias shall pay 105% of the allocated costs (the "Use Fee"). The allocated cost of BioTime employees and contractors who provide services will be based upon records maintained of the number of hours of such personnel devoted to the performance of services.

The Use Fee will be determined and invoiced to Asterias on a quarterly basis for each calendar quarter of each calendar year. If the Shared Facilities Agreement terminates prior to the last day of a billing period, the Use Fee will be determined for the number of days in the billing period elapsed prior to the termination of the Shared Facilities Agreement. Each invoice will be payable in full by Asterias within 30 days after receipt. Any invoice or portion thereof not paid in full when due will bear interest at the rate of 15% per annum until paid, unless the failure to make a payment is due to any inaction or delay in making a payment by BioTime employees from Asterias funds available for such purpose, rather than from the unavailability of sufficient funds legally available for payment or from an act, omission, or delay by any employee or agent of Asterias.

In addition to the Use Fees, Asterias will reimburse BioTime for any out of pocket costs incurred by BioTime for the purchase of office supplies, laboratory supplies, and other goods and materials and services for the account or use of Asterias, provided that invoices documenting such costs are delivered to Asterias with each invoice for the Use Fee. Furthermore, BioTime will have no obligation to purchase or acquire any office supplies or other goods and materials or any services for Asterias, and if any such supplies, goods, materials or services are obtained for Asterias, BioTime may arrange for the suppliers thereof to invoice Asterias directly.

Asterias in turn may charge BioTime or any Other Subsidiary for similar services provided by Asterias at the same rate and terms as aforementioned. "Other Subsidiary" means a subsidiary of BioTime other than Asterias and other than a subsidiary of Asterias.

The Shared Facilities Agreement's initial term ended on December 31, 2016 but the Shared Facilities Agreement was automatically renewed for an additional year. Under the Shared Facilities Agreement, the term of the Shared Facilities Agreement will automatically be renewed and the termination date will be extended for an additional year each year, unless either party gives the other party written notice stating that the Shared Facilities Agreement will terminate on December 31 of that year.

General and administrative expenses also include costs allocated from BioTime pursuant to the Shared Facilities and Services Agreement. BioTime allocated $265,000, $282,000, and $201,000 of general overhead expenses to Asterias during the years ended December 31, 2016, 2015 and 2014, respectively. At December 31, 2016 and 2015, Asterias had $288,000 and $530,000, respectively, payable to BioTime under the Shared Services Agreement.

**10. Income Taxes**

Asterias early adopted ASU 2015-17, *Income Taxes: Balance Sheet Classification of Deferred Taxes*, effective December 31, 2016, on a retrospective basis. Accordingly, Asterias adjusted the December 31, 2015, balance sheet for noncurrent deferred tax assets and current deferred tax liabilities to conform to the presentation for the current year due to the early adoption of ASU 2015-17 as follows (in thousands):

| | December 31, 2015 | | |
|---|---|---|---|
| | **As reported** | **Adjustment due to retrospective adoption of ASU 2015-17** | **As adjusted** |
| Total assets | $66,978 | $(9,744) | $57,234 |
| Total liabilities | 21,879 | (9,744) | 12,135 |
| Total liabilities and stockholders' equity | 66,978 | (9,744) | 57,234 |
| Working capital | 19,535 | 5,274 | 24,809 |

The adoption of this standard had no impact on the statements of operations or cash flows.

The primary components of the deferred tax assets and liabilities at December 31, 2016 and 2015 were as follows (in thousands):

| | December 31, | |
|---|---|---|
| | 2016 | 2015 |
| Deferred tax assets: | | |
| Net operating loss carryforwards | $16,844 | $ 9,939 |
| Research and development credits | 2,395 | 1,898 |
| Stock based compensation and other | 2,597 | 801 |
| Valuation allowance | (8,081) | (2,894) |
| Total deferred tax assets | 13,755 | 9,744 |
| Deferred tax liabilities: | | |
| Patents and licenses | (7,564) | (7,020) |
| Securities held as available for sale | (6,191) | (5,274) |
| Total deferred tax liabilities | (13,755) | (12,294) |
| Net deferred tax liabilities | $ - | $(2,550) |

Income taxes differed from the amounts computed by applying the U.S. federal income tax of 34% to pretax losses from operations as a result of the following:

| | Years Ended December 31, | |
|---|---|---|
| | 2016 | 2015 |
| Computed tax benefit at federal statutory rate | 34% | 34% |
| Permanent differences | (10%) | (3%) |
| State tax benefit, net of effect on federal income taxes | (3%) | 13% |
| Change in valuation allowance | (16%) | (13%) |
| Research and development credits | 1% | 2% |
| | 6% | 33% |

As of December 31, 2016, Asterias has net operating loss carryforwards of approximately $40.9 million and $33.4 million, respectively, for federal and California tax purposes, which expire between 2032 and 2036. In addition, as of December 31, 2016, Asterias has federal and California research tax credit carry forwards of $1.2 million and $1.2 million, respectively. The federal tax credits expire between 2032 and 2036, while the state tax credits have no expiration date.

A deferred income tax benefit of approximately $2.3 million was recorded for the year ended December 31, 2016 related to federal taxes. No state tax provision or benefit was recorded for year ended December 31, 2016. A deferred income tax benefit of approximately $7.3 million was recorded for the year ended December 31, 2015, of which approximately $7.4 million was related to federal taxes and $0.1 million was related to state taxes. A deferred income tax benefit of approximately $7.4 million was recorded for the year ended December 31, 2014, of which approximately $5.2 million was related to federal taxes and $2.2 million was related to state taxes.

Asterias established deferred tax liabilities primarily related to its acquisition of certain intellectual property and available for sale securities held in BioTime and OncoCyte common stock. Asterias established a full valuation allowance for federal deferred tax assets as of December 31, 2016. As of December 31, 2015, Asterias did not have any valuation allowance on its federal deferred tax assets due to the deferred tax liabilities exceeding the deferred tax assets as of that date. Asterias' deferred tax liabilities are a source of taxable income as prescribed by ASC 740-10-30-17. For the California deferred tax assets, Asterias established a valuation allowance as of December 31, 2016 and 2015.

In June 2014, Asterias sold 5,000,000 BioTime shares that resulted in a taxable gain of approximately $10.3 million. Asterias received the BioTime shares from BioTime as part of the consideration for the Asterias common stock and warrants issued to BioTime under an Asset Contribution Agreement among BioTime, Asterias, and Geron Corporation, in a tax-free transaction. This taxable gain was offset by available net operating losses, resulting in no income taxes due from the sale. The transaction was treated as a deemed distribution by Asterias and recorded as a charge to equity.

On December 31, 2015, BioTime distributed 4.7 million shares of OncoCyte common stock to its shareholders, including Asterias, on a pro rata basis as a dividend in kind. As part of the distribution of OncoCyte common stock, Asterias, as it also holds BioTime common stock, received 192,644 shares of OncoCyte common stock as contributed capital from BioTime resulting in a taxable gain to Asterias of $819,000. Asterias has sufficient current year losses from operations to offset the entire taxable gain resulting in no income taxes due. As the distribution was treated as a dividend in kind for financial reporting purposes, Asterias recorded the tax effect of this gain through equity consistent with BioTime's treatment of the distribution in accordance with ASC 740-20-45-11(g).

On February 16, 2016, Asterias entered into a Cross-License Agreement and Share Transfer Agreement with BioTime and BioTime's wholly owned subsidiary ES Cell International Pte. Ltd. ("ESI"). The transfer of assets was a taxable transaction to Asterias generating a taxable gain of approximately $3.1 million. Asterias has sufficient current year losses from operations to offset the entire gain resulting in no income taxes due. As the transfer of assets and the resulting taxable gain is due to a direct effect of transactions between Asterias and its then parent company, BioTime, Asterias recorded the tax effect of this gain through equity with a corresponding release of the valuation allowance, in accordance with ASC 740-20-45-11(g), during the year ended December 31, 2016.

Internal Revenue Code Section 382 places a limitation ("Section 382 Limitation") on the amount of taxable income that can be offset by net operating loss ("NOL") carryforwards after a change in control (generally greater than 50% change in ownership within a three-year period) of a loss corporation. California has similar rules. Generally, after a control change, a loss corporation cannot deduct NOL carryforwards in excess of the Section 382 Limitation. Due to these "change in ownership" provisions, utilization of the NOL and tax credit carryforwards may be subject to an annual limitation regarding their utilization against taxable income in future periods.

Asterias will file an income tax return in the U.S. federal jurisdiction, and may file income tax returns in various U.S. states and foreign jurisdictions.

Asterias may be subject to potential examination by U.S. federal, U.S. states or foreign jurisdiction authorities in the areas of income taxes. These potential examinations may include questioning the timing and amount of deductions, the nexus of income among various tax jurisdictions and compliance with U.S. federal, U.S. state and foreign tax laws. Asterias' management does not expect that the total amount of unrecognized tax benefits will materially change over the next twelve months.

**11. Segment Information**

Operating segments are defined as components of an enterprise that engage in business activities for which separate financial information is available and evaluated by the chief operating decision maker in deciding how to allocate resources and assess performance. Asterias' executive management team represents its chief operating decision maker. The executive management team reviews financial information presented on a consolidated basis for purposes of allocating resources and evaluating financial performance and there are no managers who are held accountable for levels or components below the consolidated unit level. Asterias executive management views Asterias' operations as one segment.

**12. Selected Quarterly Financial Information (unaudited) (in thousands)**

Asterias has derived this data from the unaudited interim financial statements that, in Asterias' opinion, have been prepared on substantially the same basis as the audited financial statements contained in this report and include all normal recurring adjustments necessary for a fair presentation of the financial information for the periods presented. These unaudited quarterly results should be read in conjunction with the financial statements and notes thereto included in this report. The operating results in any quarter are not necessarily indicative of the results that may be expected for any future period.

| **Year Ended December 31, 2016** | **First Quarter** | **Second Quarter** | **Third Quarter** | **Fourth Quarter** |
|---|---|---|---|---|
| Revenues, net | $ 1,541 | $ 1,526 | $ 2,017 | $ 1,742 |
| Operating expenses | 12,633 | 8,600 | 9,442 | 10,274 |
| Loss from operations before deferred tax benefits | (11,239) | (5,610) | (11,550) | (9,415) |
| Basic and diluted net loss per share | (0.27) | (0.12) | (0.24) | (0.20) |
| **Year Ended December 31, 2015** | | | | |
| Revenues, net | $ 728 | $ 734 | $ 1,247 | $ 605 |
| Operating expenses | 5,265 | 5,541 | 6,183 | 8,233 |
| Loss from operations before deferred tax benefits | (4,557) | (4,859) | (5,068) | (7,771) |
| Basic and diluted net loss per share | (0.09) | (0.10) | (0.09) | (0.13) |

**13. License and Royalty Obligations**

*Services Agreement with Cell Therapy Catapult Services Limited*

In October 2015, Asterias entered into a Services Agreement (the "Services Agreement") with Cell Therapy Catapult Services Limited ("Catapult"), a research organization specializing in the development of technologies which speed the growth of the cell and gene therapy industry. Under the Services Agreement, Catapult will license to Asterias, certain background intellectual property and will develop a scalable manufacturing and differentiation process for Asterias' human embryonic stem cell derived dendritic cell cancer vaccine development program. In consideration for the license and Catapult's performance of services, Asterias agreed to make aggregate payments of up to GBP £4,350,000 over the next five years (approximately $5.4 million based on the foreign currency exchange rate on December 31, 2016). At the option of Asterias, up to GBP £3,600,000 (approximately $4.4 million based on the foreign currency exchange rate on December 31, 2016) of such payments may be settled in shares of Asterias Series A Common Stock instead of cash. If Asterias elects to pay for the services in stock and Catapult is unable to sell the stock in the market within 60 days of issuance, after reasonable and diligent efforts through its broker, Catapult may request that the unsold portion of the stock payment, if any, be paid by Asterias in cash at a value equal to approximately 91% of the total amount that was issued in stock. This right by Catapult to put the unsold shares back to Asterias for cash expires the earlier to occur of the sale of the stock in the market or after 60 days of issuance. As of December 31, 2016, we have incurred costs since commencement of the Services Agreement of GBP £1,700,000 under the Services Agreement.

The Services Agreement may be terminated by Asterias for any reason upon 60 days prior written notice. Catapult may terminate the Services Agreement on 60 days prior written notice if it encounters a technical issue that would prevent it from completing the services at all or without obtaining additional resources, or if the estimated time and cost of completing the services will be exceeded and Catapult and Asterias do not reach agreement on revised time and cost terms. Catapult may terminate the Services Agreement in the event Asterias fails to pay any amount due under the Services Agreement 30 days after Catapult makes a written demand for payment. In addition, a non-breaching party may terminate the Services Agreement upon the occurrence a material breach that is not remedied within 30 days. Either party may terminate the Services Agreement in the event the other party becomes subject to insolvency, receivership, liquidation, or a similar event.

Advance payments for research and development services to be performed by Catapult are deferred and recognized as research and development expense ratably as the services are performed. Advance payments related to licenses will be expensed when paid due to the experimental nature of the project. Pursuant to the Services Agreement, if there are any issued, but unsold Asterias stock, to Catapult for payment of services and the 60-day put right has not expired as of the period end being reported on, Asterias will present that amount as "temporary" equity in accordance with ASC 480-10-S99. Once the put right expires or the shares are sold by Catapult, the temporary equity amount will be reclassified by Asterias to permanent equity without adjustment to the carrying value of the stock.

During 2016 and 2015, pursuant to the Services Agreement, Asterias issued 218,520 shares and 96,000 shares, respectively of Asterias Series A common stock with a fair value of $922,000 and $486,000, respectively Catapult to pay for services in lieu of cash.

*Royalty Agreement with Geron*

In connection with our acquisition of Geron's stem cell assets, Asterias entered into a royalty agreement with Geron (the "Royalty Agreement") pursuant to which Asterias agreed to pay Geron a 4% royalty on net sales (as defined in the Royalty Agreement), by Asterias or any of its affiliates or sales agents, of any products that Asterias develops and commercializes that are covered by the patents Geron contributed to Asterias. In the case of sales of such products by a person other than Asterias or one of its affiliates or sales agents, Asterias will be required to pay Geron 50% of all royalties and cash payments received by Asterias or by its affiliate in respect of a product sale. Royalty payments will be subject to proration in the event that a product covered by a patent acquired from Geron is sold in combination with another product that is not covered by a patent acquired from Geron. The Royalty Agreement will terminate at the expiration or termination date of the last issued patent contributed by Geron under the Royalty Agreement. Asterias estimates that the latest patent expiration date will be in 2032.

*Asterias License from WARF*

Asterias has entered into a Non-Exclusive License Agreement with Wisconsin Alumni Research Foundation ("WARF") under which Asterias was granted a worldwide non-exclusive license under certain WARF patents and WARF-owned embryonic stem cell lines to develop and commercialize therapeutic, diagnostic and research products.

In consideration of the rights licensed, Asterias has agreed to pay WARF an upfront license fee, payments upon the attainment of specified clinical development milestones, royalties on sales of commercialized products, and, subject to certain exclusions, a percentage of any payments that Asterias may receive from any sublicenses that it may grant to use the licensed patents or stem cell lines.

The license agreement will terminate with respect to licensed patents upon the expiration of the last licensed patent to expire. Asterias may terminate the license agreement at any time by giving WARF prior written notice. WARF may terminate the license agreement if payments of earned royalties, once begun, cease for a specified period of time or if Asterias and any third parties collaborating or cooperating with Asterias in the development of products using the licensed patents or stem cell lines fail to spend a specified minimum amount on research and development of products relating to the licensed patents or stem cell lines for a specified period of time. WARF also has the right to terminate the license agreement if Asterias breaches the license agreement or becomes bankrupt or insolvent or if any of the licensed patents or stem cell lines are offered to creditors. The payments to WARF were a recurring $25,000 license maintenance fee for each of the years 2016, 2015 and 2014.

*Asterias License from the University of California*

Geron assigned to Asterias its Exclusive License Agreement with The Regents of the University of California for patents covering a method for directing the differentiation of multipotential hES cells to glial-restricted progenitor cells that generate pure populations of oligodendrocytes for remyelination and treatment of spinal cord injury. Pursuant to this agreement, Asterias has an exclusive worldwide license under such patents, including the right to grant sublicenses, to create products for biological research, drug screening, and human therapy using the licensed patents. Under the license agreement, Asterias will be obligated to pay the university a royalty of 1% from sales of products that are covered by the licensed patent rights, and a minimum annual royalty of $5,000 starting in the year in which the first sale of a product covered by any licensed patent rights occurs, and continuing for the life of the applicable patent right under the agreement. The royalty payments due are subject to reduction, but not by more than 50%, to the extent of any payments that Asterias may be obligated to pay to a third party for the use of patents or other intellectual property licensed from the third party in order to make, have made, use, sell, or import products or otherwise exercise its rights under the Exclusive License Agreement. Asterias will be obligated to pay the university 7.5% of any proceeds, excluding debt financing and equity investments, and certain reimbursements, that its receives from sublicensees, other than Asterias' affiliates and joint ventures relating to the development, manufacture, purchase, and sale of products, processes, and services covered by the licensed patent. The Company had no expenses related to these fees in the years 2016, 2015, and 2014, respectively. The license agreement will terminate on the expiration of the last-to-expire of the university's issued licensed patents. If no further patents covered by the license agreement are issued, the license agreement would terminate in 2024. The university may terminate the agreement in the event of Asterias' breach of the agreement. Asterias can terminate the agreement upon 60 days' notice.

*Asterias Sublicense from Geron*

Asterias has received from Geron an exclusive sublicense under certain patents owned by the University of Colorado's University License Equity Holdings, Inc. relating to telomerase (the "Telomerase Sublicense"). The Telomerase Sublicense entitles Asterias to use the technology covered by the patents in the development of AST-VAC1 and AST-VAC2 as immunological treatments for cancer. Under the Telomerase Sublicense, Asterias paid Geron a one-time upfront license fee of $65,000, and will pay Geron an annual license maintenance fee of $10,000 due on each anniversary of the effective date of the Telomerase Sublicense, and a 1% royalty on sales of any products that Asterias may develop and commercialize that are covered by the sublicensed patents. In 2016, 2015 and 2014 Asterias paid $134,000, $281,000, and $105,000 respectively under this agreement in combined maintenance and royalty fees.

The Telomerase Sublicense will expire concurrently with the expiration of Geron's license. That license will terminate in November 2018 when the licensed patents expire.

**14. Clinical Trial and Option Agreement with CRUK and CIRM Grant Award**

During September 2014, Asterias entered into a Clinical Trial and Option Agreement (the "CRUK Agreement") with Cancer Research UK ("CRUK") and Cancer Research Technology Limited, a wholly-owned subsidiary of CRUK, pursuant to which CRUK has agreed to fund Phase 1/2 clinical development of Asterias' human embryonic stem cell derived AST-VAC2 allogeneic (non-patient specific) dendritic cancer vaccine product candidate. Asterias, at its own cost, completed process development and manufacturing scale-up of the AST-VAC2 manufacturing process and transferred the resulting cGMP-compatible process to CRUK. CRUK will, at its own cost, manufacture clinical grade AST-VAC2 and will carry out the Phase 1/2 clinical trial of AST-VAC2 in cancer patients both resected early-stage and advanced forms of lung cancer. Asterias will have an exclusive first option to obtain a license to use the data from the clinical trial. If Asterias exercises that option, then Asterias will be obligated to make payments upon the execution of the License Agreement, upon the achievement of various milestones, and royalties on sales of products. In connection with the CRUK Agreement, Asterias sublicensed to CRUK for use in the clinical trials and product manufacturing process certain patents that have been licensed or sublicensed to us by third parties. Asterias would also be obligated to make payments to those licensors and sublicensors upon the achievement of various milestones, and then royalties on sales of products if AST-VAC2 is successfully developed and commercialized.

On October 16, 2014 Asterias signed a Notice of Grant Award ("NGA") with CIRM, effective October 1, 2014, with respect to a $14.3 million grant award for clinical development of Asterias' product, AST-OPC1. The NGA was subsequently amended effective November 26, 2014 and March 2, 2016. The NGA includes the terms under which CIRM will release grant funds to Asterias. Under the NGA as amended on March 2, 2016, CIRM will disburse the grant funds to Asterias based on Asterias' attainment of certain progress milestones.

Asterias received $0.9 million during 2014 and an additional $5.7 million under the NGA during 2015. During the fiscal year ended December 31, 2016, Asterias received an additional $6.2 million under the NGA grant with approximately $1.5 million expected upon further clinical milestone achievements. There can be no assurance Asterias will receive this remaining amount or that the milestones will be met. Revenues pursuant to the NGA recognized during the fiscal years ended December 31, 2016, 2015 and 2014 were $6.6 million and $3.0 million and $1.0 million, respectively. Although the cash payments from CIRM are dependent on achieving certain milestones pursuant to the contract with CIRM, Asterias recognizes grant income as related research expenses are incurred. Deferred revenues relating to the CIRM grant were $2.2 million and $2.5 million at December 31, 2016 and 2015, respectively.

**15. Cross-License and Share Transfer with BioTime and Subsidiaries**

On February 16, 2016, Asterias entered into a Cross-License Agreement (the "Cross-License") with BioTime and BioTime's wholly owned subsidiary ESI. Under the terms of the Cross-License, Asterias received a fully-paid, non-royalty-bearing, world-wide, non-exclusive, sub-licensable license under certain BioTime patents and related patent rights and ESI patents and related patent rights specified in the Cross-License, for all purposes in the Asterias Licensed Field, as defined in the Cross-License agreement, during the term of the license.

Under the terms of the Cross-License, BioTime and ESI received a fully-paid, non-royalty-bearing, world-wide, non-exclusive, sub-licensable license in, to, and under the certain Asterias patents and related patent rights for all purposes in the BioTime/ESI Licensed Field, as defined in the Cross-License agreement, during the term of the license.

On February 16, 2016, Asterias also entered into a Share Transfer Agreement ("Share Transfer") with BioTime and ESI pursuant to which (a) Asterias transferred to BioTime 2,100,000 shares of common stock of OrthoCyte Corporation ("OrthoCyte) and 21,925 ordinary shares of Cell Cure Neurosciences Ltd ("Cell Cure"), each a majority-owned subsidiary of BioTime, with an aggregate carrying value at the time of the transaction of approximately $416,000 and (b) BioTime transferred to Asterias 75,771 shares of Series A common stock of Asterias with a carrying value at the time of the transaction of approximately $197,000 and warrants to purchase 3,150,000 Series A common stock of Asterias at an exercise price of $5.00 per share, with a carrying value at the time of the transaction of approximately $2.0 million, as additional consideration for the license of patents and patent rights from Asterias under the Cross License. On March 20, 2016, the warrants to purchase 3,150,000 shares of Series A common stock were retired by Asterias in addition to 75,771 shares of Series A common stock retired.

The Cross-License and Share Transfer transaction was accounted for a transfer of assets between entities under common control and recorded at carrying value, with the resulting gain on transfer of approximately $1.8 million recorded by Asterias in equity as contributed capital to BioTime in accordance with, and pursuant to ASC 805-50, *Transactions Between Entities Under Common Control*. Accordingly, the net financial reporting impact of the Cross-License and Share Transfer of $0.4 million charged to additional paid-in capital was comprised of the retirement of the aggregate $2.2 million carrying value of the warrants and the Series A Common Stock offset by the $1.8 million transfer gain.

The transfer of assets was also a taxable transaction to Asterias generating a taxable gain of approximately $3.1 million as further discussed in Note 10.

**16. Subsequent Events**

*Extension of Warrants*

On February 3, 2017, Asterias extended the expiration date of the outstanding Distribution Warrants and the Romulus Warrants to September 29, 2017. As a result of this extension, Asterias will recognize a $2.0 million expense which will be included in general and administrative expenses for the quarter ending March 31, 2017.

*Amendment to ATM Agreement*

On March 28, 2017, Asterias entered into an amendment to its Sales Agreement, dated April 10, 2015, with MLV. The amendment to the Sales Agreement was entered into by Asterias, MLV and FBR Capital Markets & Co. ("FBR" and together with MLV, the "Agents"), which acquired MLV. Under the Sales Agreement, as amended, Asterias may issue and sell shares of its Series A common stock having an aggregate offering price of up to $25 million from time to time on or after March 28, 2017, through the Agents, subject to certain limitations, including the number of shares registered and available under the Company's previously filed and currently effective shelf registration statement on Form S-3 (File No. 333-215154) (the "Registration Statement"). From January 1 through March 21, 2017, Asterias has sold approximately 1.3 million shares of Series A common stock for gross proceeds of $5.3 million.

Any sales of shares of the Company's Series A common stock pursuant to the Sales Agreement, as amended, will be made under the Registration Statement and the related prospectus supplement to filed pursuant to thereunder. The Agents may sell the Series A common stock under the Sales Agreement, as amended, by any method that is deemed to be an "at-the-market offering" as defined in Rule 415 promulgated under the Securities Act of 1933, as amended, including by means of ordinary brokers' transactions at market prices, in block transactions or as otherwise agreed by the Agents and Asterias. The Agents may also sell the Series A common stock in negotiated transactions, subject to Asterias' prior approval. Subject to the terms and conditions of the Sales Agreement, as amended, the Agents will use its commercially reasonable efforts consistent with its normal trading and sales practices and applicable laws, rules and regulations to sell the shares of the Series A common stock from time to time, based upon Asterias' instructions (including any price, time or size limits or other parameters or conditions Asterias may impose). Asterias will pay the Agents a commission of up to 3.0% of the gross proceeds of the sale of any Series A common stock sold through FBR as agent under the Sales Agreement, as amended. Asterias has also provided the Agents with customary indemnification rights.