As filed with the Securities and Exchange Commission on March 9, 2016

Registration No. 333-209079

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

AMENDMENT NO. 3
TO
FORM S-1
REGISTRATION STATEMENT
UNDER THE SECURITIES ACT OF 1933

Heat Biologics, Inc.
(Exact name of Registrant as specified in its charter)

Delaware	**2836**	**26-2844103**
(State or other jurisdiction of incorporation or organization)	*(Primary Standard Industrial Classification Code Number)*	*(I.R.S. Employer Identification Number)*

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801 Capitola Drive
Durham, North Carolina 27713
(919) 240-7133
(Address, including zip code, and telephone number, including area code, of Registrant's principal executive offices)

Jeffrey Wolf
Chief Executive Officer and
Chairman of the Board of Directors
Heat Biologics, Inc.
801 Capitola Drive
Durham, North Carolina 27713
(919) 240-7133
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

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New York, New York 10174	**(212) 262-6700**
(212) 907-6457	

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

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

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act of 1933, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act of 1933, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act of 1933, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering. ☐

If delivery of the prospectus is expected to be made pursuant to Rule 424, check the following box. ☐

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

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

CALCULATION OF REGISTRATION FEE

Title of each class of securities to be registered	Proposed maximum aggregate offering price(1)	Amount of registration fee(2)
Common Stock, $0.0002 par value (2)		
Warrants to purchase shares of common stock (2)		
Shares of common stock issuable upon exercise of the Warrants (2)		
Total	**$8,000,000**	**$806 (3)**

(1) Estimated solely for the purpose of calculating the amount of the registration fee pursuant to Rule 457(o) of the Securities Act of 1933, as amended (the "Securities Act").
(2) Pursuant to Rule 416, the securities being registered hereunder include such indeterminate number of additional securities as may be issued after the date hereof as a result of stock splits, stock dividends or similar transactions.
(3) Previously paid.

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

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

Subject to completion, dated March 9, 2016

PRELIMINARY PROSPECTUS

Shares of Common Stock
Warrants to Purchase Up to Shares of Common Stock

We are offering $8,000,000 of shares of our common stock and warrants to purchase shares of our common stock. Each share of our common stock is being sold together with of a warrant to purchase one share of our common stock. Each warrant will have an exercise price per share of not less than 100% of the closing bid price of our common stock on the trading day immediately preceding the pricing of this offering, will be immediately exercisable and will expire on the fifth anniversary of the original issuance date. The shares of our common stock and warrants are immediately separable and will be issued separately, but will be purchased together in this offering.

Our common stock is listed on the NASDAQ Capital Market under the symbol "HTBX." On March 7, 2016, the last reported sale price of our common stock on the NASDAQ Capital Market was $0.94 per share. There is no established trading market for the warrants and we do not expect a market to develop. In addition, we do not intend to apply for the listing of the warrants on any national securities exchange or other trading market. Without an active trading market, the liquidity of the warrants will be limited.

We are an "emerging growth company" as that term is used in the Jumpstart Our Business Startups Act of 2012 (the "JOBS Act") and, as such, have elected to comply with certain reduced public company reporting requirements. See "Prospectus Summary—Implications of Being an Emerging Growth Company."

Investing in our securities involves risk. See "Risk Factors" beginning on page 9 of this prospectus for a discussion of information that should be considered in connection with an investment in our securities.

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

	Per Share and Related Warrant	Total
Public offering price	$	$
Underwriting discount (1)	$	$
Proceeds, before expenses, to us	$	$

(1) We have also agreed to reimburse the underwriters for certain expenses. See "Underwriting" beginning on page 104 of this prospectus for a description of the compensation payable to the underwriters.

We expect that delivery of the common stock and the warrants offered hereby against payment will be made on or about , 2016.

Sole Book-Running Manager
Roth Capital Partners

Lead Manager
Aegis Capital Corp

, 2016

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You should rely only on the information contained in this prospectusand any free writing prospectus that we have authorized for use in connection with this offering. Neither we nor the underwriters have authorized anyone to provide you with information that is different. We are offering to sell, and seeking offers to buy, the securities covered hereby only in jurisdictions where offers and sales are permitted. The information in this prospectus is accurate only as of the date of this prospectus, regardless of the time of delivery of this prospectus or any sale of the securities covered hereby. Our business, financial condition, results of operations and prospects may have changed since that date. We are not, and the underwriters are not, making an offer of these securities in any jurisdiction where the offer is not permitted.

For investors outside the United States: Neither we nor any of the underwriters have taken any action that would permit this offering or possession or distribution of this prospectus in any jurisdiction where action for that purpose is required, other than in the United States. Persons outside the United States who come into possession of this prospectus must inform themselves about, and observe any restrictions relating to, the offering of the securities covered hereby and the distribution of this prospectus outside of the United States.

This prospectus includes statistical and other industry and market data that we obtained from industry publications and research, surveys and studies conducted by third parties. Industry publications and third-party research, surveys and studies generally indicate that their information has been obtained from sources believed to be reliable, although they do not guarantee the accuracy or completeness of such information. We believe that the data obtained from these industry publications and third-party research, surveys and studies are reliable. We are ultimately responsible for all disclosure included in this prospectus.

We further note that the representations, warranties and covenants made by us in any agreement that is filed as an exhibit to the registration statement of which this prospectus is a part were made solely for the benefit of the parties to such agreement, including, in some cases, for the purpose of allocating risk among the parties to such agreements, and should not be deemed to be a representation, warranty or covenant to you. Moreover, such representations, warranties or covenants were accurate only as of the date when made. Accordingly, such representations, warranties and covenants should not be relied on as accurately representing the current state of our affairs.

Except where the context requires otherwise, in this prospectus the "Company," "Heat Biologics," "Heat," "we," "us" and "our" refer to Heat Biologics, Inc., a Delaware corporation formed in June 2008, and, where appropriate, its subsidiaries, Heat Biologics I, Inc., Heat Biologics III, Inc., Heat Biologics IV, Inc., Heat Biologics GmbH and Heat Biologics Australia Pty LTD.

PROSPECTUS SUMMARY

This summary highlights selected information contained elsewhere in this prospectus. This summary is not intended to be complete and does not contain all of the information that you should consider before deciding to invest in our securities. You should read this entire prospectus carefully, especially the "Risk Factors" section beginning on page 9 and our financial statements and the notes thereto contained in the prospectus, before making an investment decision. Except where the context requires otherwise, in this prospectus the terms "Company," "Heat," "we," "us" and "our" refer to Heat Biologics, Inc., a Delaware corporation.

Company Overview

We are an immuno-oncology company developing novel therapies intended to activate a patient's immune system to fight cancer. Using our T cell-stimulating platform technologies, *ImPACT*® (Immune Pan-Antigen Cytotoxic Therapy) and *ComPACT*™ (Combination Pan-Antigen Cytotoxic Therapy), we have generated several product candidates that we believe may be effective in treating certain forms of cancer. Our platform technologies address two synergistic mechanisms of action: activation of CD8+ T cells, or "killer" T cells; and T cell co-stimulation . We believe the use of these technologies has the potential to enhance patients' natural immune response against certain cancers.

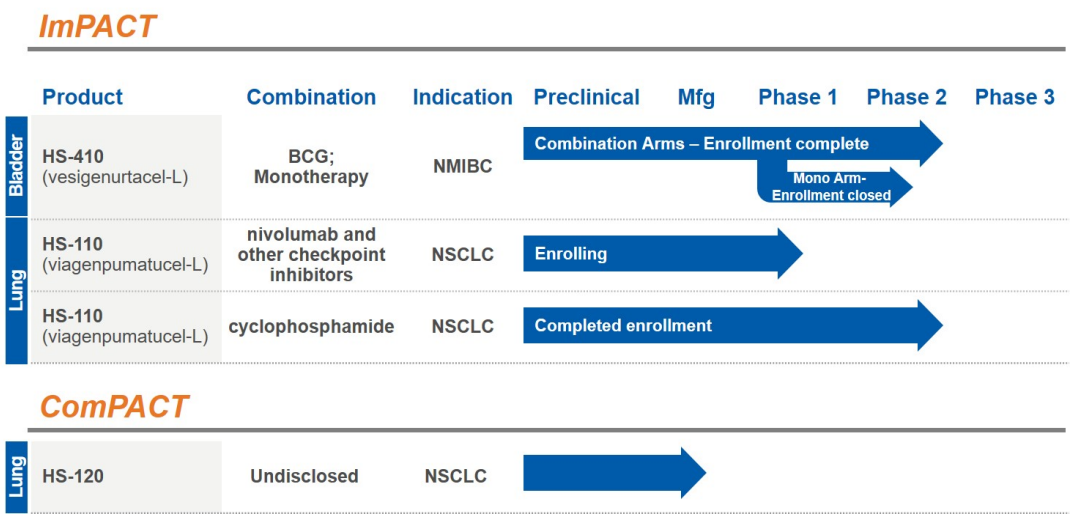
Using our *ImPACT*® platform technology , we have developed product candidates that consist of live, genetically-modified, irradiated human cancer cells which secrete a broad spectrum of tumor-associated antigens ("TAAs") together with a potent immune response stimulator called "gp96." The secreted antigen-gp96/TAA complexes activate a patient's immune system to recognize and kill cancer cells that express the TAAs included in the product candidates, which we have engineered to address the most prevalent TAAs present in the "tumor signature" of a specific cancer.

Our *ComPACT*™ platform technology enables us to combine a pan-antigen T cell activating vaccine and a T cell co-stimulator in a single product, offering the potential benefits of combination immunotherapy without the need for multiple independent biologic products. Using *ComPACT*™ , we have engineered new product candidates that incorporate various ligand fusion proteins targeting co-stimulatory receptors (OX40, ICOS, 4-1BB) into the gp96-Ig expression vector, resulting in a single product candidate that includes both a pan-antigen T cell priming vaccine and a T cell co-stimulator .

Using our platform technologies, we produce product candidates from allogeneic cell lines selected to express the broadest array of commonly shared tumor antigens for a specified type of cancer. Unlike autologous or "personalized" therapeutic vaccine approaches that require the extraction of blood or tumor tissue from each patient and the creation of an individualized treatment, our product candidates are fully allogeneic, do not require extraction of individual patient's material or custom manufacturing. As a result, our product candidates can be mass-produced and readily available for immediate patient use. Because each patient receives the same treatment, we believe that our immunotherapy approach offers logistical, manufacturing and other cost benefits compared to one-off , patient-specific approaches.

Using our *ImPACT*® platform technology, we have developed HS-410 (vesigenurtacel-L) as a product candidate to treat non-muscle invasive bladder cancer ("NMIBC") and HS-110 (viagenpumatucel-L) , intended for use in combination with an anti-PD-1 checkpoint inhibitor , as a potential treatment for patients with non-small cell lung cancer ("NSCLC"). To-date, we have administered in excess of 1,000 doses of HS-410 and HS-110 collectively in approximately 200 patients. We are currently conducting a Phase 2 trial of HS-410 in patients with NMIBC and a Phase 1b trial of HS-110, in combination with nivolumab (Opdivo®), a Bristol- Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. Using our *ComPACT*™ platform technology, we have developed HS-120 as a potential treatment for NSCLC. We expect to file an Investigational New Drug, or IND, submission for our first *ComPACT*™ product candidate for non-small cell lung cancer (HS-120) in the second half of 2016.

The table below summarizes our current product candidates and their stages of development:



HS-410 – Bladder Cancer

HS-410 (vesigenurtacel-L) is a biologic product candidate comprising a cancer cell line genetically modified using our*ImPACT*® technology platform to secrete a wide range of cancer antigens related to bladder cancer bound to gp96 molecules . We believe that HS-410 has the potential to activate a T cell mediated pan-antigen immune response that could be an effective treatment for patients with NMBIC.

We are currently conducting a Phase 2 trial evaluating HS-410 either alone or in combination with intravesical standard of care, Bacillus Calmette-Guérin (BCG), for the treatment of high-risk NMIBC. The primary endpoint is one-year disease free survival. We completed enrollment for the Phase 2 trial's three randomized, combination arms and anticipate reporting topline efficacy, immune-response and safety data in the fourth quarter of 2016.

On February 25, 2016, we announced that we will no longer enroll new patients in our Phase 2 monotherapy trial arm evaluating HS-410 alone for the treatment of NMIBC. We added the monotherapy trial arm in response to the intermittent global shortage of standard of care BCG in early 2015. The shortage has since then been resolved and as such, we will no longer enroll new patients in this trial arm based on discussions with the U.S. FDA. The decision does not relate to concerns regarding the safety profile of HS-410. The 16 patients currently enrolled, out of the anticipated 25 patients, can continue receiving HS-410 monotherapy per the study protocol. We anticipate reporting topline 6-month data from these 16 patients in the fourth quarter of 2016, contemporaneous with reporting data from our three randomized Phase 2 trial arms evaluating HS-410 in combination with BCG.

On February 10, 2016, we announced that the U.S. FDA had lifted the partial clinical hold on our HS-410 Phase 2 clinical trial and that patient enrollment had resumed; clinical timelines were materially unchanged. On February 3, 2016, we announced that we had concluded that the cell line on which HS-410 is based, which is a prostate cancer cell line, had been previously misidentified as a bladder cancer cell line, that we had advised the U.S. FDA of this conclusion and that the U.S. FDA had placed our HS-410 Phase 2 clinical trial on partial clinical hold while they reviewed certain updated documentation provided by us related to the misidentification. The misidentification related to the origin of the cell line and not to the antigen profile or other characteristics of the cell line, which have been accurately characterized throughout the clinical development of HS-410. The partial clinical hold did not relate to concerns regarding the safety and efficacy of HS-410. All data generated and reported remained unchanged, including HS-410's positive safety profile, immune response and shared antigenic profile with patient tumors. Upon becoming aware of the misidentification, we amended all of the documentation necessary to correct the error, including the related investigator brochure, study protocol and informed consent form. Due to the short duration of the clinical hold, we do not expect any material change in our clinical timelines. In addition, we do not expect that the misidentification will have any adverse effect on the future clinical development of HS-410. While our rights to the prostate cancer cell line are non-exclusive, we believe that our intellectual property portfolio, which we expect to be unaffected by the misidentification, will provide us with appropriate protection for the development and potential commercialization of HS-410.

In January 2016, we reported three-month interim data from the unblinded, monotherapy cohort of our company's ongoing Phase 2 trial of HS-410 for the treatment of NMIBC at the Phacilitate Immunotherapy World Conference. In the monotherapy arm, a series of weekly intradermal injections of HS-410 is being dosed as an alternative to BCG. Images of the bladder taken from several treated patients showed changes that resemble lymphoid (T cell rich) structures that we have observed in biopsy samples, which we believe indicates that HS-410 is generating an immune response as expected. Six out of seven patients in the monotherapy arm, who had reached the 3-month timepoint after treatment with HS-410 alone, remained recurrence free. One of those patients had *carcinoma in situ* (*CIS*) – the patient population believed to be least responsive to BCG – and that patient experienced complete response.

In November 2015, we announced the results from our Phase 1 trial, evaluating the safety and immune response of HS-410, after surgery and treatment with BCG, in patients with high-risk NMIBC. In that trial, HS-410 exhibited a positive safety profile and was well-tolerated with no serious adverse events (SAEs) and no patients discontinuing the trial due to adverse events (AEs). 7 out of the 10 patients had no documented recurrence of cancer >1 year after treatment. 3 out of 4 patients with CIS did not experience a recurrence one year after treatment. In the study subjects, HS-410 elicited a broad-based (polyclonal) expansion of patient T cells and a high level of CD8+ tumor-infiltrating lymphocytes (TILs). Additionally, based on tissue samples taken from each patient, HS-410 shared 15 or more tumor antigens in common with those expressed on the patients' cancer cells, which we believe supports our belief that HS-410 has the ability to target a broad range of tumor antigens. These data confirm previous preclinical findings regarding the unique mechanism of action for HS-410. Moreover, third-party analysis of blinded samples from the trial demonstrated a strong correlation between baseline characteristics of TILs by T cell receptor (TCR) sequencing and clinical outcome. Specifically, the 7 patients who remained disease free after one year exhibited the greatest clonal expansion of intratumoral T cells (p-value 0.0126).

In October 2015, we completed enrollment of our 75-patient, blinded, randomized, placebo-controlled arms of our ongoing Phase 2 clinical trial evaluating HS-410 in combination with BCG in patients with high risk NMIBC. Our Phase 2 trial will examine safety, tolerability, immune response and preliminary clinical activity of HS-410. The primary endpoint is one-year disease free survival. We expect to report topline efficacy, immune-response and safety results in the fourth quarter of 2016.

In March 2015, the U.S. Food and Drug Administration ("FDA") granted Fast Track designation for HS-410 for the treatment of NMIBC. The Fast Track program is designed to facilitate the development and expedite the review of therapies intended to treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs. The advantages of Fast Track designation include actions to expedite development, including opportunities for frequent interactions with the FDA review team to discuss all aspects of developments to support approval and eligibility for priority review depending on clinical data at the time of Biologics License Application ("BLA") submission. We believe that this designation will expedite our development of HS-410.

HS-110 – Non-Small Cell Lung Cancer ("NSCLC")

HS-110 (viagenpumatucel-L) is a biologic product candidate comprising a cancer cell line that has been genetically modified using our *ImPACT*® technology platform to secrete a wide range of cancer associated antigens related to lung cancer bound to gp96 proteins . We believe that HS-110 has the potential to activate a T-cell mediated pan-antigen immune response that could be an effective treatment for patients with NSCLC.

We are conducting a Phase 1b clinical trial evaluating HS-110 in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. The multicenter, open label trial is expected to initially enroll 18 patients and is designed to accommodate cohort expansion up to 30 patients in total. The purpose of the trial is to evaluate the safety and efficacy of HS-110 in combination with nivolumab, an FDA approved anti-PD-1 checkpoint inhibitor, in patients with NSCLC whose cancers have progressed after first-line therapy. Primary and secondary trial endpoints include safety and tolerability, immune response, overall response rate and progression-free survival. Top-line objective response rate and 6-month progression free survival (PFS) data are expected by the end of 2016 for these first 18 patients.

We also are conducting a Phase 2 clinical trial evaluating HS-110 in combination with low dose cyclophosphamide versus chemotherapy alone as a potential third-line or fourth-line treatment in patients with NSCLC. We completed enrollment of 66 patients in this study in September 2015. These patients will be followed for immune response and overall survival with data expected to be reported in the fourth quarter of 2016.

The inventor of the *ImPACT*® technology that we license reported results in February 2013 from a Phase 1 open-label, single center clinical trial of HS-110 in patients with advanced NSCLC. We believe the results provide clinical evidence that HS-110 is capable of generating anti-cancer immune responses. In the study, 18 patients were vaccinated, and 15 of the 18 vaccinated patients completed the first course of three planned courses of therapy. Two patients completed all three planned courses of therapy (defined as three, six week treatment cycles). HS-110 showed no overt toxicity. There were no serious adverse events (SAEs) that were considered by the trial investigator to be treatment-related. Most of the adverse events (AEs) were reported as mild or moderate (grade 1 or 2) with the most frequent being injection site reactions and rash that were transitory and usually resolved in one to two weeks. We believe the results of this Phase 1 trial with HS-110 demonstrate that HS-110 is capable of generating a CD8-CTL IFN- γ immune response in patients with advanced NSCLC. Eleven of the fifteen patients (73%) who completed the first course of therapy with HS-110, exhibited a two-fold or greater increase in CD8+ cells secreting interferon gamma (CD8-CTL IFN- γ). The estimated median survival of these eleven patients was 16.5 months (95% CI:7.1-20.0). In comparison, the 4 patients who failed to show increased CD8-CTL IFN-γ responses survived 2.1, 2.3, 6.7, and 6.7 months, or a median survival of 4.5 months, which is consistent with the expected survival times in this patient population. In 7 of 18 treated patients, tumor growth was stabilized, however no partial or complete tumor responses (e.g., reduction or disappearance of tumors) were observed in any of the 18 patients. The median one-year overall survival rate of patients in the study was 44% (95% CI:21.6-65.1), comparing favorably to a 5.5% rate based on published data from 43-patient advanced lung cancer population. One of the late-stage lung cancer patients survived over four years since starting the therapy and another patient survived over three years since starting the therapy. These findings were consistent with multiple preclinical published studies on *ImPACT*® therapy.

Additional Indications

We continue to evaluate other potential indications for our *ImPACT*® and *ComPACT*™ platform technologies. Specifically, using *ComPACT*™, we have developed cell lines for several other cancers with the first product candidate being a second-generation therapy for non-small cell lung cancer (HS-120). Our decision to further pursue these product candidates or any additional product candidates other than our two lead product candidates will be based in part upon available funding and partnering opportunities. On February 18, 2015, we announced a collaboration with OncoSec Medical Inc. to evaluate the feasibility of OncoSec's ImmunoPulse *in vivo* electroporation technology for intra-tumoral delivery of gp96-Ig encoding DNA plasmids to activate specific immune responses against 'private,' mutation-derived tumor neo-antigens. This collaboration is ongoing, and we expect to announce data demonstrating that intratumoral electroporation of *ComPACT*™ plasmid DNA leads to release of tumor specific neo antigens in the first half of 2016.

***ComPACT*™**

On June 15, 2015, we announced the development of a next-generation platform incorporating various T cell costimulatory ligand fusion proteins into the gp96-Ig expression vector. *ComPACT*™ combines a pan-antigen T cell priming vaccine and T cell co-stimulator in a single product, offering the potential benefits of combination immunotherapy in a single drug without the need for multiple independent biologic products. *ComPACT*™ has been engineered to incorporate various fusion proteins targeting co-stimulatory receptors (OX40, ICOS, 4-1BB), enabling the combination of two important immunotherapy pathways in a single drug. We have reported preclinical data demonstrating that *ComPACT* secreting OX40L generated the most potent immune response among other *ComPACT* co-stimulator variations including TL1A, 4-1BBL and ICOSL, as well as compared to systemic delivery of OX40 agonist antibody and vaccine alone. For our *ComPACT*™ platform technology, we expect to file an IND for our first *ComPACT*™ product candidate for NSCLC (HS-120) in the second half of 2016.

***ImPACT*® Therapy**

Our *ImPACT*® therapy is a novel technology platform designed to educate and stimulate the immune system to combat specific disease targets, such as cancer cells. *ImPACT*® utilizes live attenuated, human-derived, genetically-modified cells to generate an array of tumor associated antigens and secrete an essential immunostimulatory protein called "gp96-Ig". The secreted proteins are designed to generate an immune response against cancer cells by mobilizing and activating a patient's own killer T cells to target a broad array of different tumor antigens with the goal of eliminating cancer cells. In contrast with other vaccine technologies that target only one antigen, *ImPACT*®*'s* pan-antigen approach may enable the body to induce and maintain an immune response against a broad array of tumor-specific proteins, by potentially providing a more robust and sustained immune response and limiting cancer cells' ability to evade the immune system. We believe the clinical and preclinical results suggest that *ImPACT*® generates anti-tumor immune responses capable of targeting and destroying tumors. We believe our novel, off-the-shelf, live cell therapy has the potential to be used to combat a wide range of cancers. We have leveraged our existing infrastructure by developing additional product candidates in areas where we can use our proprietary technology. Our success will depend on the clinical and regulatory success of our product candidates and our ability to retain, on commercially reasonable terms, financial and managerial resources, which are currently limited. To date, we have not received regulatory approval for any of our product candidates or derived any revenues from their sales. Moreover, there can be no assurance that we will ever receive regulatory approval for any of our product candidates or derive any revenues from their sales.

***ImPACT*® / *ComPACT*™ Platform Technologies Advantages:**

- *ImPACT*® therapy represents a cell-based product platform that functions as both an immune activator and an antigen-delivery vehicle.
- In addition, to our knowledge *ImPACT*® is the only adjuvant currently in clinical development that is specific to CD8+ cytotoxic T cell immune responses, which we believe is especially important for developing therapeutics in oncology.
- *Our therapies do not require an additional adjuvan*. Some vaccines require the addition of another drug, called an adjuvant, to enhance their effectiveness. Adjuvants typically cause irritation at the injection site. HS-110, one of our product candidates, is itself an adjuvant, so we do not have to use additional adjuvants to generate and maintain an activated immune response, thereby limiting any injection site reaction to that caused by our own therapies.
- *ComPACT*™ represents a potential dual-acting immunotherapy, combining a pan-antigen T cell priming vaccine and T cell co-stimulator in a single product.
- To our knowledge, *ComPACT*™ represents the first dual-acting immunotherapy that provides more effective stimulation of CD8+T cells and higher rates of tumor rejection than are achieved with either individual administration of traditional vaccines, OX40 agonist antibodies, or combinations with OX40 agonist antibodies and traditional vaccines.

The CD8+ cytotoxic T cell specific nature of our *ImPACT*® and *ComPACT*™ platform technologies predict that they will be most useful in stimulating immune responses for diseases where actual cell-killing is an important part of the therapeutic effect. Cancer, which is a disease of mutated cells, naturally became the first area of focus. *ImPACT*® and *ComPACT*™ applied to cancer therapies contrast in several critical ways to other cancer immunotherapy technologies:

- Both *ImPACT*® and *ComPACT*™ platform technologies offer our ready-to-use approach which do not require any personalized manufacturing. We believe our therapeutic vaccines *are easier and less expensive to manufacture than autologous vaccines* because our therapeutic vaccines do not require the harvesting of blood and/or tumor tissue from each patient in order to manufacture a course of treatment. We believe this is highly advantageous because it can bring the logistics, manufacturing, cost and distribution of our therapeutic vaccines within the purview of traditional biopharmaceutical product channels and dramatically expand our pool of corporate partners.
- Both *ImPACT*® and *ComPACT*™ platform technologies stimulate an immune response against the full antigenic repertoire of the cancer cells, not just one or a handful of antigens. Our *ImPACT*® and *ComPACT*™ platform technologies are designed to combine broad antigen targeting of known and unknown tumor associated antigens complexed with a potent immune adjuvant. The activated immune response generated by our platform technologies may be useful in treating a wide range of cancers.
- There are no other allogeneic, cell-based vaccine technologies which provide a molecular transporter (gp96-Ig in the case of *ImPACT*® and *ComPACT*™) to provide specific activation of a patient's CD8+ T cells across MHC barriers.

Strategy

Our objective is to become a leading biopharmaceutical company specializing in the development and commercialization of allogeneic, ready-to-use immunotherapies. Our platform technologies, *ImPACT*® and *ComPACT*™, are designed to address two synergistic mechanisms of action: robust activation of killer T cells and T cell co-stimulation to further enhance patients' immune response. We believe future cancer immunotherapy will involve multiple agents and our platform could work synergistically with other therapies, such as checkpoint inhibitors, which are designed to reverse tumor-induced immune suppression. We are focused on discovering, developing and applying our *ImPACT*® and *ComPACT*™ platform technologies towards a number of disease indications. The key elements of our strategy are:

- *Develop and obtain regulatory approval for our product candidates.* We have completed enrollment for the randomized arms of our NMIBC Phase 2 trial evaluating HS-410 in combination with BCG and are no longer enrolling new patients in the monotherapy arm of our NMIBC Phase 2 trial evaluating HS-410. We expect to report topline efficacy, immune response and safety results in the fourth quarter of 2016. We are conducting a Phase 1b trial of HS-110 in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. Beyond NSCLC and bladder cancer - depending upon funding and partnering opportunities - we plan to initiate additional clinical trials and in some cases expand current clinical trials in these and other disease targets utilizing our *ImPACT*® and *ComPACT*™ platform technologies.

- *Maximize commercial opportunity for our ImPACT® and ComPACT™ technology.* Our current product candidates target large markets with significant unmet medical needs. For each of our product candidates, we seek to retain all manufacturing, marketing and distribution rights which should give us the ability to maximize the economic potential of any future U.S. or international commercialization efforts. We believe that we should be well positioned to successfully commercialize our product candidates independently or through United States and international corporate partnerships.

- *Enhance our partnering efforts.* We are continually exploring partnerships for licensing and other collaborative relationships and remain opportunistic in seeking strategic partnerships.

- *Further expand our broad patent portfolio.* We have made a significant investment in the development of our patent portfolio to protect our technologies and programs, and we intend to continue to do so. We have obtained exclusive rights to six different patent families directed to therapeutic compositions and methods related to our vaccine platform and preclinical development programs for cancer and have filed certain additional patent applications that are owned by us. Our *ImPACT®/ComPACT*™ patent portfolio comprises eighteen issued patents and thirty-one pending patent applications. These patents and applications cover the United States, Europe, and Japan as well as several other countries having commercially significant markets.

- *Manage our business with efficiency and discipline.* We believe we have efficiently utilized our capital and human resources to develop and acquire our product candidates and programs, and create a broad intellectual property portfolio. We operate cross-functionally and are led by an experienced management team with backgrounds in developing and commercializing product candidates. We use project management techniques to assist us in making disciplined strategic program decisions and to attempt to limit the risk profile of our product pipeline.

- *Obtain additional grant funding.* To more fully develop our *ImPACT*® and *ComPACT*™ platform technologies and their application to a variety of human diseases, we plan to continue to seek and access external sources of grant funding on our own behalf and in conjunction with our academic and other partners to support the development of our pipeline programs. While we intend to work with our academic partners to secure additional grant funding, these partners have no obligation to work with us to secure such funding. We also intend to continue to evaluate opportunities and, as appropriate, acquire or license technologies that meet our business objectives.

- *Continue to both leverage and fortify our intellectual property portfolio.* We believe that we have a strong intellectual property position relating to the development and commercialization of our *ImPACT*® and *ComPACT*™ platform technologies. We plan to continue to leverage our portfolio to create value. In addition to fortifying our existing intellectual property position, we intend to file new patent applications, in-license new intellectual property and take other steps to strengthen, leverage, and expand our intellectual property position.

Corporate Background

We were incorporated under the laws of the State of Delaware on June 10, 2008. Our principal offices are located at 801 Capitola Drive, Durham, North Carolina 27713. Our website address is www.heatbio.com. The information contained in, and that can be accessed through, our website is not incorporated into and is not a part of this report.

Implications of Being an Emerging Growth Company

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

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

We may take advantage of these provisions for up to five years or such earlier time that we are no longer an emerging growth company. We would cease to be an emerging growth company on the date that is the earliest of (i) the last day of the fiscal year in which we have total annual gross revenues of $1 billion or more; (ii) the last day of our fiscal year following the fifth anniversary of the date of the completion of our initial public offering; (iii) the date on which we have issued more than $1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer under the rules of the Securities and Exchange Commission. We have taken advantage of reduced reporting requirements in this prospectus. Accordingly, the information contained herein may be different than the information you receive from other public companies in which you have beneficial ownership.

The Offering

Common stock offered by us	8,510,638 shares (assuming a combined public offering price of $0.94 per share and related warrant, the last reported sale price of our common stock on the NASDAQ Capital Market on March 7, 2016).
Warrants offered	Warrants to purchase up to shares of our common stock (assuming a combined public offering price of $0.94 per share and related warrant, the last reported sale price of our common stock on the NASDAQ Capital Market on March 7, 2016). Each share of our common stock is being sold together with of a warrant to purchase one share of our common stock. Each warrant will have an exercise price per share of not less than 100% of the closing bid price of our common stock on the trading day immediately preceding the pricing of this offering, will be immediately exercisable and will expire on the fifth anniversary of the original issuance date.
Common stock to be outstanding after the offering	16,935,279 shares (assuming a public offering price of $0.94 per share, the last reported sale price of our common stock on the NASDAQ Capital Market on March 7, 2016) (or shares if the warrants sold in this offering are exercised in full).
Use of Proceeds	We intend to use the net proceeds of this offering to continue to fund our current Phase 2 trial of HS-410 for the treatment of NMIBC; to advance the current patients enrolled in our current Phase 1b trial evaluating HS-110 in combination with nivolumab, a Bristol-Myers Squibb PD-1 checkpoint inhibitor, for the treatment of NSCLC through the reporting of topline data; and working capital and general corporate purposes. See "Use of Proceeds."
Risk Factors	See the section entitled "Risk Factors" beginning on page 9 of this prospectus for a discussion of factors you should carefully consider before deciding to invest in our securities.
Market symbol and trading	Our common stock is listed on the Nasdaq Capital Market under the symbol "HTBX." There is no established trading market for the warrants and we do not expect a market to develop. In addition, we do not intend to apply for the listing of the warrants on any national securities exchange or other trading market. Without an active trading market, the liquidity of the warrants will be limited.

The number of shares of common stock shown above to be outstanding after this offering is based on 8,424,641 shares outstanding as of December 31, 2015, and excludes as of such date:

- 1,214,686 shares of our common stock issuable upon exercise of outstanding options under our equity incentive plans at a weighted-average exercise price of $4.93 per share;
- 142,392 shares of our common stock reserved for issuance upon the exercise of outstanding warrants with a weighted-average exercise price of $11.03 per share; and
- 453,297 shares of our common stock that are reserved for equity awards that may be granted under our equity incentive plans.

Unless otherwise indicated, the information in this prospectus assumes no exercise by the underwriters of their overallotment option.

RISK FACTORS

Investors should carefully consider the risks described below before deciding whether to invest in our securities. If any of the following risks actually occurs, our business, financial condition or results of operations could be adversely affected. In such case, the trading price of our common stock could decline and you could lose all or part of your investment. Our actual results could differ materially from those anticipated in the forward-looking statements made throughout this prospectus as a result of different factors, including the risks we face described below.

Risks Relating to our Company

We have had limited operations to date.

We are a clinical stage company and have had limited operations to date. We have yet to demonstrate our ability to overcome the risks frequently encountered in our industry and are still subject to many of the risks common to such enterprises, including our ability to implement our business plan, market acceptance of our proposed business and products, under-capitalization, cash shortages, limitations with respect to personnel, financing and other resources, competition from better funded and experienced companies, and uncertainty of our ability to generate revenues. There is no assurance that our activities will be successful or will result in any revenues or profit, and the likelihood of our success must be considered in light of the stage of our development. Even if we generate revenue, there can be no assurance that we will be profitable. In addition, no assurance can be given that we will be able to consummate our business strategy and plans, or that financial, technological, market, or other limitations may force us to modify, alter, significantly delay, or significantly impede the implementation of such plans. We have insufficient results for investors to use to identify historical trends. Investors should consider our prospects in light of the risk, expenses and difficulties we will encounter as an early stage company. Our revenue and income potential is unproven and our business model is continually evolving. We are subject to the risks inherent to the operation of a new business enterprise, and cannot assure you that we will be able to successfully address these risks.

We have a limited operating history upon which to evaluate our ability to commercialize our products

We are a clinical stage company and our success is dependent upon our ability to obtain regulatory approval for and commercialize our products and we have not demonstrated an ability to perform the functions necessary for the approval or successful commercialization of any product candidates. The successful commercialization of any product candidates will require us to perform a variety of functions, including:

- continuing to undertake preclinical development and successfully enroll patients in clinical trials;
- participating in regulatory approval processes;
- formulating and manufacturing products; and
- conducting sales and marketing activities.

While various members of our management and staff have significant experience in conducting cancer trials, our company, to date, has not successfully completed any clinical trials other than the Phase 1 portion of our Phase 1/2 bladder cancer trial and has limited experience conducting and enrolling patients in clinical trials. Until recently, our operations have been limited primarily to organizing and staffing our company, acquiring, developing and securing our proprietary technology and undertaking preclinical trials and preparing for our early clinical trials of our product candidates. These operations provide a limited basis for you to assess our ability to commercialize our product candidates and the advisability of investing in our securities.

Our consolidated financial statements have been prepared assuming that we will continue as a going concern

Our operating losses, negative cash flows from operations and limited alternative sources of revenue raise substantial doubt about our ability to continue as a going concern. The consolidated financial statements for the year ended December 31, 2015 do not include any adjustments that might result from the outcome of this uncertainty. If we cannot raise adequate capital on acceptable terms we will need to revise our business plans.

We may continue to generate operating losses and experience negative cash flows and it is uncertain whether we will achieve profitability.

For the years ended December 31, 2015 and December 31, 2014, we incurred a net loss of $21.1 million and $12.2 million, respectively. We have an accumulated deficit of $44.4 million through December 31, 2015. We expect to continue to incur operating losses until such time, if ever, as we are able to achieve sufficient levels of revenue from operations. Our ability to achieve profitability will depend on obtaining regulatory approval for our product candidates, market acceptance of our product offerings and our capacity to develop, introduce and sell our products to our targeted markets. There can be no assurance that any of our product candidates will be approved for commercial sale, or even if our product candidates are approved for commercial sale, that we will ever generate significant sales or achieve profitability. Accordingly, the extent of future losses and the time required to achieve profitability, if ever, cannot be predicted at this point.

Even if we succeed in developing and commercializing one or more product candidates, we expect to incur substantial losses for the foreseeable future and may never become profitable. We also expect to continue to incur significant operating expenses and anticipate that our expenses will increase substantially in the foreseeable future as we:

- continue to undertake preclinical development and conduct clinical trials for product candidates;
- seek regulatory approvals for product candidates;
- implement additional internal systems and infrastructure; and
- hire additional personnel.

We also expect to experience negative cash flows for the foreseeable future as we fund our operating losses. As a result, we will need to generate significant revenues or raise additional financing in order to achieve and maintain profitability. We may not be able to generate these revenues or achieve profitability in the future. Our failure to achieve or maintain profitability would likely negatively impact the value of our securities and financing activities.

We are substantially dependent on the success of our product candidates, HS-410 and HS-110/HS-120 and we cannot provide any assurance that any of our product candidates will be commercialized.

To date, our main focus and the investment of a significant portion of our efforts and financial resources has been in the development of our product candidates, HS-410 and HS-110, for which we are currently actively conducting Phase 2 and Phase 1b clinical trials, respectively. Our future success depends heavily on our ability to successfully manufacture, develop, obtain regulatory approval, and commercialize these product candidates, which may never occur. Before commercializing either product candidate, we will require additional clinical trials and regulatory approvals for which there can be no guarantee that we will be successful. We currently generate no revenues from our product candidates, and we may never be able to develop or commercialize a marketable drug.

If we experience delays in the enrollment of patients in our clinical trials, our receipt of necessary regulatory approvals could be delayed or prevented.

Our inability to locate and enroll a sufficient number of eligible patients in our clinical trials for any of our current or future clinical trials would result in significant delays or may require us to abandon one or more clinical trials. Our ability to enroll patients in trials is affected by many factors out of our control including the size and nature of the patient population, the proximity of patients to clinical sites, the eligibility criteria for the trial, the design of the clinical trial, competing clinical trials and clinicians' and patients' perceptions as to the potential advantages of the drug being studied in relation to other available therapies, including any new drugs that may be approved for the indications we are investigating.

We currently have no product revenues and may not generate revenue at any time in the near future, if at all.

We currently have no products for sale and we cannot guarantee that we will ever have any drug products approved for sale. We and our product candidates are subject to extensive regulation by the FDA, and comparable regulatory authorities in other countries governing, among other things, research, testing, clinical trials, manufacturing, labeling, promotion, marketing, adverse event reporting and recordkeeping of our product candidates. Until, and unless, we receive approval from the FDA and other regulatory authorities for our product candidates, we cannot commercialize our product candidates and will not have product revenues. For the foreseeable future, we will have to fund all of our operations from equity and debt offerings, cash on hand and grants. We believe that due to our current cash position and estimates of expenses, there is substantial doubt about our ability to continue as a going concern. In addition, changes may occur that would consume our available capital at a faster pace than expected, including changes in and progress of our development activities, acquisitions of additional candidates and changes in regulation. Moreover, preclinical studies and clinical trials may not start or be completed as we forecast and may not achieve the desired results. Therefore, we expect that we will seek additional sources of funding, such as additional financing or grant funding, and additional financing may not be available on favorable terms, if at all. Our ability to raise capital through the sale of equity may be limited by the various rules of the Securities and Exchange Commission and the Nasdaq Capital Market which place limits on the number of shares of stock that may be sold. If we do not succeed in raising additional funds on acceptable terms, we may be unable to complete planned preclinical and clinical trials or obtain approval of our product candidates from the FDA and other regulatory authorities. In addition, we could be forced to delay, discontinue or curtail product development, forego sales and marketing efforts, and forego licensing in attractive business opportunities. Any additional sources of financing will likely involve the issuance of our equity or debt securities, which will have a dilutive effect on our stockholders.

If we do not comply with the covenants under our secured loans with Square 1 Bank, we may be forced to seek other sources of financing and if we default on our secured loan with Square 1 Bank we could be forced to suspend all operations.

We have entered into loans with Square 1 Bank that are secured by substantially all of our assets, excluding our intellectual property. Our loan agreement with Square 1 Bank sets forth various affirmative and negative covenants that we must comply with, including covenants regarding financial reporting, limits on our cash burn, incurrence of indebtedness and liens and mergers and acquisitions. In addition, we are required to continually run two clinical trials. If we fail to comply with these covenants or if we fail to make timely monthly payments under the secured loans when due, Square 1 Bank could declare our loans in default. Additionally, if we do not commercialize a product by the maturity date of the loan, we may be unable to repay the loans to Square 1 Bank. If we default on the loans, Square 1 Bank has the right to seize the collateral secured by the loans, which could result in our licenses reverting back to our licensor and could force us to suspend all operations. In order to comply with the covenants of the loans and to make timely payments to Square 1 Bank under the loans, we may need to raise additional capital, which might not be available to us on favorable terms or at all.

Risks Relating to our Business

If we do not obtain the necessary regulatory approvals in the United States and/or other countries we will not be able to sell our product candidates

We cannot assure you that we will receive the approvals necessary to commercialize any of our product candidates or any product candidates we acquire or develop in the future. We will need FDA approval to commercialize our product candidates in the United States and approvals from the FDA-equivalent regulatory authorities in foreign jurisdictions to commercialize our product candidates in those jurisdictions. In order to obtain FDA approval of any product candidate, we must submit to the FDA a BLA, demonstrating that the product candidate is safe, pure and potent, or effective for its intended use. This demonstration requires significant research including preclinical studies, as well as clinical trials. Satisfaction of the FDA's regulatory requirements typically takes many years, depends upon the type, complexity and novelty of the product candidate and requires substantial resources for research, development and testing. We cannot predict whether our clinical trials will demonstrate the safety and efficacy of our product candidates or if the results of any clinical trials will be sufficient to advance to the next phase of development or for approval from the FDA. We also cannot predict whether our research and clinical approaches will result in drugs or therapeutics that the FDA considers safe and effective for the proposed indications. The FDA has substantial discretion in the drug approval process. The approval process may be delayed by changes in government regulation, future legislation or administrative action or changes in FDA policy that occur prior to or during our regulatory review. Delays in obtaining regulatory approvals may:

- prevent or delay commercialization of, and our ability to derive product revenues from, our product candidates; and
- diminish any competitive advantages that we may otherwise believe that we hold.

Even if we comply with all FDA requests, the FDA may ultimately reject one or more of our BLAs. We may never obtain regulatory clearance for any of our product candidates. Failure to obtain FDA approval of any of our product candidates will severely undermine our business by leaving us without a saleable product, and therefore without any source of revenues, until another product candidate can be developed. There is no guarantee that we will ever be able to develop or acquire another product candidate.

In addition, the FDA may require us to conduct additional preclinical and clinical testing or to perform post-marketing studies, as a condition to granting marketing approval of a product. Regulatory approval of oncology products often requires that patients in clinical trials be followed for long periods to assess their overall survival. The results generated after approval could result in loss of marketing approval, changes in product labeling, and/or new or increased concerns about the side effects or efficacy of a product. The FDA has significant post-market authority, including the explicit authority to require post-market studies and clinical trials, labeling changes based on new safety information, and compliance with FDA-approved risk evaluation and mitigation strategies. The FDA's exercise of its authority has in some cases resulted, and in the future could result, in delays or increased costs during product development, clinical trials and regulatory review, increased costs to comply with additional post-approval regulatory requirements and potential restrictions on sales of approved products.

In foreign jurisdictions, we must also receive approval from the appropriate regulatory authorities before we can commercialize any vaccines. Foreign regulatory approval processes generally include all of the risks associated with the FDA approval procedures described above. There can be no assurance that we will receive the approvals necessary to commercialize our product candidates for sale outside the United States.

Our product candidates are in early stages of development.

Because our product candidates are in early stages of development they will require extensive preclinical and clinical testing. Although certain of our product candidates have commenced Phase 1b and Phase 2 clinical trials, we cannot predict with any certainty if or when we might submit a BLA for regulatory approval for any of our product candidates or whether any such BLA will be accepted for review by the FDA, or whether any BLA will be approved upon review.

Even if our clinical trials are completed as planned, we cannot be certain that their results will support our proposed indications. Success in preclinical testing and early clinical trials does not ensure that later clinical trials will be successful, and we cannot be sure that the results of later clinical trials will replicate the results of prior clinical trials and preclinical testing. For example, the only clinical study of HS-410 completed to date showed evidence of an immune response in NMIBC patients exposed to HS-410. However, our current Phase 2 clinical trial of HS-410 is using doses and dosing regimens which have not previously been tested, and combinations with other immunotherapy agents will be conducted which may result in different responses. In addition, immune response is not an acceptable regulatory endpoint for approval, and the HS-410 Phase 1 trial involved a small sample size and was not randomized or blinded. The clinical trial process may fail to demonstrate that our product candidates are safe and effective for their proposed uses. This failure could cause us to abandon a product candidate and may delay development of other product candidates. Any delay in, or termination of, our clinical trials will delay and possibly preclude the filing of any BLAs with the FDA and, ultimately, our ability to commercialize our product candidates and generate product revenues.

Clinical trials are very expensive, time-consuming and difficult to design and implement

As part of the regulatory process, we must conduct clinical trials for each product candidate to demonstrate safety and efficacy to the satisfaction of the FDA and other regulatory authorities. The number and design of the clinical trials that will be required varies depending upon product candidate, the condition being evaluated and the trial results themselves. Therefore, it is difficult to accurately estimate the cost of the clinical trials. Clinical trials are very expensive and difficult to design and implement, in part because they are subject to rigorous regulatory requirements. The clinical trial process is also time consuming. We estimate that clinical trials of our product candidates will take at least several years to complete. Furthermore, failure can occur at any stage of the trials, and we could encounter problems that cause us to abandon or repeat clinical trials. The commencement and completion of clinical trials may be delayed or prevented by several factors, including:

- unforeseen safety issues;
- failure to determine appropriate dosing;
- greater than anticipated cost of our clinical trials;
- failure to demonstrate effectiveness during clinical trials;
- slower than expected rates of patient recruitment or difficulty obtaining investigators;
- patient drop-out or discontinuation;
- inability to monitor patients adequately during or after treatment;
- third party contractors failing to comply with regulatory requirements or meet their contractual obligations to us in a timely manner;
- insufficient or inadequate supply or quality of product candidates or other necessary materials to conduct our trials;
- potential additional safety monitoring, or other conditions required by FDA or comparable foreign regulatory authorities regarding the scope or design of our clinical trials, or other studies requested by regulatory agencies;
- problems engaging IRBs to oversee trials or in obtaining and maintaining IRB approval of studies;
- imposition of clinical hold or suspension of our clinical trials by regulatory authorities; and
- inability or unwillingness of medical investigators to follow our clinical protocols.

In addition, we or the FDA may suspend or terminate our clinical trials or arms of our clinical trials at any time if it appears that we are exposing participants to unacceptable health risks, in response to standard of care and changes in standard of care or if the FDA finds deficiencies in our Investigational New Drug, or IND, submissions or the conduct of these trials. Therefore, we cannot predict with any certainty when, if ever, future clinical trials will commence or be completed.

On February 25, 2016, we announced that we will no longer enroll new patients in our Phase 2 monotherapy trial arm evaluating HS-410 alone for the treatment of NMIBC. We added the monotherapy trial arm in response to the intermittent global shortage of standard of care BCG in early 2015. The shortage has since then been resolved and as such, we will no longer enroll new patients in this trial arm based on discussions with the U.S. FDA.

We are at risk of a clinical hold at any time based on the evaluation of the data and information submitted to the governing regulatory authorities. On February 2, 2016, we received notice from the FDA of a partial clinical hold on our Phase 2 HS-410 clinical trial despite the fact that we did not have a safety concern. The partial clinical hold came after we concluded that the cell line on which HS-410 is based had been previously misidentified. The partial clinical hold was lifted on February 10, 2016. However, if in the future we are delayed in addressing, or unable to address, any FDA concerns, we could be delayed, or prevented, from conducting our clinical trials.

Misidentification of cell lines could impact our clinical development and intellectual property rights.

Our product candidates are based on human cell lines produced by third parties and licensed by us. Cell line characterization and contamination is a known issue in biomedical research. For example, despite standard procedures to identify the origins and characteristics of our cell lines we recently discovered that the origin of the cell line used in HS-410 was misidentified. The misidentification resulted in the FDA placing our HS-410 Phase 2 clinical trial on partial clinical hold while the FDA reviewed certain updated documentation provided by us related to the misidentification. In the event we were to use a cell line in the future that is also misidentified, the clinical development of the product candidate utilizing the mischaracterized cell line could be materially and adversely affected, we could lose the right to use the cell line and our intellectual property rights relating to our development of product candidates based on that cell line could be materially and adversely affected. Although we have implemented certain additional procedures to properly identify our cell lines, we may not be able to detect that a cell line has been mischaracterized or mislabeled by a third party.

There is uncertainty as to market acceptance of our technology and product candidates.

Even if the FDA approves one or more of our product candidates, the products may not gain broad market acceptance among physicians, healthcare payers, patients, and the medical community. We have conducted our own research into the markets for our product candidates; however we cannot guarantee market acceptance of our product candidates, if approved, and have somewhat limited information on which to estimate our anticipated level of sales. Our product candidates, if approved, will require patients, healthcare providers and doctors to adopt our technology. Our industry is susceptible to rapid technological developments and there can be no assurance that we will be able to match any new technological advances. If we are unable to match the technological changes in the needs of our customers the demand for our products will be reduced. Acceptance and use of any products we market will depend upon a number of factors including:

- perceptions by members of the health care community, including physicians, about the safety and effectiveness of our products;
- limitation on use or warnings required by FDA in our product labeling;
- cost-effectiveness of our products relative to competing products;
- convenience and ease of administration;
- potential advantages of alternative treatment methods;
- availability of reimbursement for our products from government or other healthcare payers; and
- effectiveness of marketing and distribution efforts by us and our licensees and distributors, if any.

Because we expect virtually all of our product revenues for the foreseeable future to be generated from sales of our current product candidates, if approved, the failure of these therapeutics to find market acceptance would substantially harm our business and would adversely affect our revenue.

Our development program partially depends upon third-party researchers who are outside our control

We are dependent upon independent investigators and collaborators, such as universities and medical institutions, to conduct our clinical trials under agreements with us. These collaborators are not our employees and we cannot control the amount or timing of resources that they devote to our programs. These investigators may not assign as great a priority to our programs or pursue them as diligently as we would if we were undertaking such programs ourselves. If outside collaborators fail to devote sufficient time and resources to our development programs, or if their performance is substandard, the approval of our FDA applications, if any, and our introduction of new product candidates, if any, will be delayed if obtained at all. These collaborators may also have relationships with other commercial entities, some of whom may compete with us. If our collaborators assist our competitors at our expense, our competitive position would be harmed.

We will rely significantly on third parties to formulate and manufacture our product candidates

We have developed certain experience in the formulation, development and/or manufacturing of biologics but do not intend to establish our own manufacturing facilities. To date, the selection and initial replication of our biological cell lines used in our trials has been performed by individuals working at third party laboratories over which we have little process or quality control and therefore the process and replication could be subject to human error. We lack the resources and expertise to formulate or manufacture our own product candidates. The investigational products for our clinical trials are manufactured by our contractors under current good manufacturing practices, ("cGMPs") and we have entered into agreements with commercial-scale manufacturers for the production and supply of investigational product for additional Phase 2 and Phase 3 clinical trials as well as commercialization. We must also develop and validate a potency assay prior to submission of a license application. Such assays have traditionally proven difficult to develop for cell-based products and must be established prior to initiating any Phase 3 clinical trials. If any of our current product candidates, or any product candidates we may develop or acquire in the future, receive FDA approval, we will rely on one or more third-party contractors for manufacturing. Our anticipated future reliance on a limited number of third-party manufacturers exposes us to the following risks:

We may be unable to identify manufacturers on acceptable terms or at all because the number of potential manufacturers with appropriate expertise and facilities is limited.

If we change manufacturers at any point during the development process or after approval, we will be required to demonstrate comparability between the products made by the old and new manufacturers. If we are unable to do so, we may need to conduct additional clinical trials with product manufactured by the new manufacturer. Accordingly, it may be necessary to evaluate the comparability of the HS-110 produced by the two different manufacturers at some point during the clinical development process.

If we change the manufacturer of a product subsequent to the approval of the product, we will need to obtain approval from the FDA of the change in manufacturer. Any such approval would likely require significant testing and expense, and the new manufacturer may be subject to a cGMP inspection prior to approval.

Our third-party manufacturers might be unable to formulate and manufacture our product candidates in the volume and with the quality required to meet our clinical needs and commercial needs, if any.

Our contract manufacturers may not perform as agreed or may not remain in the contract manufacturing business for the time required to supply our clinical trials or to successfully produce, store and distribute our product candidates.

Drug manufacturers are subject to ongoing periodic unannounced inspection by the FDA, and corresponding state agencies to ensure compliance with cGMPs and other government regulations and corresponding foreign standards. We do not have control over third-party manufacturers' compliance with these regulations and standards.

If any third-party manufacturer makes improvements in the manufacturing process for our products, we may not own, or may have to share, the intellectual property rights to the innovation.

Our contract manufacturers have in the past and may in the future encounter difficulties in achieving quality control and quality assurance and may experience shortages in qualified personnel. Our contract manufacturers are subject to inspections by the FDA and comparable agencies in other jurisdictions to assess compliance with applicable regulatory requirements. Any failure to follow cGMP or other regulatory requirements or delay, interruption or other issues that arise in the manufacture, packaging, or storage of our products as a result of a failure of the facilities or operations of third parties to comply with regulatory requirements or pass any regulatory authority inspection could significantly impair our ability to develop and commercialize our products, including leading to significant delays in the availability of products for our clinical studies or the termination or hold on a clinical study, or the delay or prevention of a filing or approval of marketing applications for our product candidates. Significant noncompliance could also result in the imposition of sanctions, including fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approvals for our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of products, operating restrictions and criminal prosecutions, any of which could damage our reputation. If we or our contract manufacturers are not able to maintain regulatory compliance, we may not be permitted to market our products and/or may be subject to product recalls, seizures, injunctions, or criminal prosecution.

Each of these risks could delay our clinical trials, the approval, if any, of our product candidates by the FDA or the commercialization of our product candidates or could also result in higher costs or deprive us of potential product revenues.

For each of our product candidates, we rely upon a single third party to manufacture and supply our drug substance. Any problems experienced by either our third party manufacturers or their vendors could result in a delay or interruption in the supply of our product candidate to us until the third party manufacturer or its vendor cures the problem or until we locate and qualify an alternative source of manufacturing and supply.

For each of our product candidates we currently rely on third party manufacturers to purchase from their third party vendors the materials necessary to produce our product candidates and manufacture our product candidates for our clinical studies. If either of our third party manufacturers were to experience any prolonged disruption for our manufacturing we could be forced to seek additional third party manufacturing contracts, thereby increasing our development costs and negatively impacting our timeliness and any commercialization costs.

For each of our ongoing clinical trials, we are administering our product candidates, in combination with other immunotherapy agents. Any problems obtaining the other immunotherapy agents could result in a delay or interruption in our clinical trials.

For each of our ongoing clinical trials we administer our product candidate in combination with other immunotherapy agents, such as BCG and nivolumab. If any of the immunotherapy agents that are used in our clinical trials are unavailable while the trials are continuing, our timeliness and commercialization costs could be impacted. The recent shortage of BCG initially negatively impacted our timeliness of our Phase 2 trial of HS-410.

Adverse effects resulting from other immunotherapy drugs or therapies could also negatively affect the perceptions by members of the health care community, including physicians, about the safety and effectiveness of our product candidates.

There are many other companies that have developed or are currently trying to develop immunology vaccines for the treatment of cancer. If adverse effects were to result from any immunotherapy drugs or therapies being developed, manufactured and marketed by others it could be attributed to our products or immunotherapy protocols as a whole. Any such attribution could negatively affect the perceptions by members of the health care community, including physicians, about the safety and effectiveness of our product candidates and the future of immunotherapy for the treatment of cancer. Our industry is susceptible to rapid technological changes and there can be no assurance that we will be able to match any new technological challenges presented by the adverse effects resulting from immunotherapy drugs or therapies developed, manufactured or marketed by others.

Even if we are able to obtain regulatory approval for our product candidates, we will continue to be subject to ongoing and extensive regulatory requirements, and our failure, or the failure of our contract manufacturers, to comply with these requirements could substantially harm our business.

If the FDA approves any of our product candidates, the labeling, manufacturing, packaging, adverse event reporting, storage, advertising, promotion and record-keeping for our products will be subject to ongoing FDA requirements and continued regulatory oversight and review. We may also be subject to additional FDA post-marketing obligations. If we are not able to maintain regulatory compliance, we may not be permitted to market our product candidates and/or may be subject to product recalls or seizures. The subsequent discovery of previously unknown problems with any marketed product, including AEs of unanticipated severity or frequency, may result in restrictions on the marketing of the product, and could include withdrawal of the product from the market.

A fast track designation by the FDA may not actually lead to a faster development or regulatory review or approval process.

We have been granted fast track designation for HS-410 and may seek fast track designation for future product candidates. The FDA has broad discretion whether to grant this designation, and even if we believe a particular product candidate is eligible for this designation, we cannot assure you that the FDA would decide to grant it. Moreover, we may not experience a faster development process, review or approval compared to conventional FDA procedures for HS-410, and the FDA may withdraw fast track designation if it believes that the designation is no longer supported by data from our clinical development program.

We have no experience selling, marketing or distributing products and have no internal capability to do so

We currently have no sales, marketing or distribution capabilities. We do not anticipate having the resources in the foreseeable future to allocate to the sales and marketing of our proposed products, if approved. Our future success depends, in part, on our ability to enter into and maintain collaborative relationships for such capabilities, the collaborator's strategic interest in the products under development and such collaborator's ability to successfully market and sell any such products. We intend to pursue collaborative arrangements regarding the sales and marketing of our products, however, there can be no assurance that we will be able to establish or maintain such collaborative arrangements, or if able to do so, that our collaborators will have effective sales forces. To the extent that we decide not to, or are unable to, enter into collaborative arrangements with respect to the sales and marketing of our proposed products, significant capital expenditures, management resources and time will be required to establish and develop an in-house marketing and sales force with technical expertise. There can also be no assurance that we will be able to establish or maintain relationships with third party collaborators or develop in-house sales and distribution capabilities. To the extent that we depend on third parties for marketing and distribution, any revenues we receive will depend upon the efforts of such third parties, and there can be no assurance that such efforts will be successful. In addition, there can also be no assurance that we will be able to successfully market and sell our products in the United States or overseas on our own.

We may not be successful in establishing and maintaining strategic partnerships, which could adversely affect our ability to develop and commercialize products.

We may seek to enter into strategic partnerships in the future, including alliances with other biotechnology or pharmaceutical companies, to enhance and accelerate the development and commercialization of our products. We face significant competition in seeking appropriate strategic partners and the negotiation process is time-consuming and complex. Moreover, we may not be successful in our efforts to establish a strategic partnership or other alternative arrangements for any future product candidates and programs because our research and development pipeline may be insufficient, our product candidates and programs may be deemed to be at too early of a stage of development for collaborative effort and/or third parties may not view our product candidates and programs as having the requisite potential to demonstrate safety and efficacy or return on investment. Even if we are successful in our efforts to establish strategic partnerships, the terms that we agree upon may not be favorable to us and we may not be able to maintain such strategic partnerships if, for example, development or approval of a product candidate is delayed or sales of an approved product are disappointing.

If we ultimately determine that entering into strategic partnerships is in our best interest but either fail to enter into, are delayed in entering into or fail to maintain such strategic partnerships:

- the development of certain of our current or future product candidates may be terminated or delayed;
- our cash expenditures related to development of certain of our current or future product candidates may increase significantly and we may need to seek additional financing;
- we may be required to hire additional employees or otherwise develop expertise, such as sales and marketing expertise, for which we have not budgeted;
- we will bear all of the risk related to the development of any such product candidates; and
- the competitiveness of any product candidate that is commercialized could be reduced.

To the extent we elect to enter into licensing or collaboration agreements to partner our product candidates, our dependence on such relationships may adversely affect our business.

Our commercialization strategy for certain of our product candidates may depend on our ability to enter into agreements with collaborators to obtain assistance and funding for the development and potential commercialization of these product candidates. Supporting diligence activities conducted by potential collaborators and negotiating the financial and other terms of a collaboration agreement are long and complex processes with uncertain results. Even if we are successful in entering into one or more collaboration agreements, collaborations may involve greater uncertainty for us, as we have less control over certain aspects of our collaborative programs than we do over our proprietary development and commercialization programs. We may determine that continuing a collaboration under the terms provided is not in our best interest, and we may terminate the collaboration. Our collaborators could delay or terminate their agreements, and our product candidates subject to collaborative arrangements may never be successfully developed or commercialized.

Further, our future collaborators may develop alternative products or pursue alternative technologies either on their own or in collaboration with others, including our competitors, and the priorities or focus of our collaborators may shift such that our programs receive less attention or fewer resources than we would like, or they may be terminated altogether. Any such actions by our collaborators may adversely affect our business prospects and ability to earn revenues. In addition, we could have disputes with our future collaborators, such as the interpretation of terms in our agreements. Any such disagreements could lead to delays in the development or commercialization of any potential products or could result in time-consuming and expensive litigation or arbitration, which may not be resolved in our favor.

If we cannot compete successfully for market share against other drug companies, we may not achieve sufficient product revenues and our business will suffer

The market for our product candidates is characterized by intense competition and rapid technological advances. If any of our product candidates receives FDA approval, it will compete with a number of existing and future drugs and therapies developed, manufactured and marketed by others. Existing or future competing products may provide greater therapeutic convenience or clinical or other benefits for a specific indication than our products, or may offer comparable performance at a lower cost. If our products fail to capture and maintain market share, we may not achieve sufficient product revenues and our business will suffer.

We will compete against fully integrated pharmaceutical companies and smaller companies that are collaborating with larger pharmaceutical companies, academic institutions, government agencies and other public and private research organizations. Many of these competitors have oncology compounds already approved or in development. In addition, many of these competitors, either alone or together with their collaborative partners, operate larger research and development programs or have substantially greater financial resources than we do, as well as significantly greater experience in:

- developing drugs, biologics and other therapies;
- undertaking preclinical testing and clinical trials;
- obtaining FDA and other regulatory approvals of drugs, biologics and other therapies;
- formulating and manufacturing drugs, biologics and other therapies; and
- launching, marketing and selling drugs, biologics and other therapies.

We have limited protection for our intellectual property.

We intend to rely on a combination of common law copyright, patent, trademark, and trade secret laws and measures to protect our proprietary information. We have obtained exclusive rights to license the technology for which patent protection has been obtained; however, certain patents expire in 2019 and such protection does not prevent unauthorized use of such technology. In addition, certain cell lines used in our product candidates, including the one used in HS-410, are not protected by patents and our licenses thereto are non-exclusive. Trademark and copyright protections may be limited, and enforcement could be too costly to be effective. It may also be possible for unauthorized third parties to copy aspects of, or otherwise obtain and use, our proprietary information without authorization, including, but not limited to, product design, software, customer and prospective customer lists, trade secrets, copyrights, patents and other proprietary rights and materials. Other parties can use and register confusingly similar business, product and service names, as well as domain names, which could divert customers, resulting in a material adverse effect on our business, operating results and financial condition.

If we fail to successfully enforce our intellectual property rights, our competitive position could suffer, which could harm our operating results. Competitors may challenge the validity or scope of our patents or future patents we may obtain. In addition, our licensed patents may not provide us with a meaningful competitive advantage. We may be required to spend significant resources to monitor and police our licensed intellectual property rights. We may not be able to detect infringement and our competitive position may be harmed. In addition, competitors may design around our technology or develop competing technologies. Intellectual property rights may also be unavailable or limited in some foreign countries, which could make it easier for competitors to capture market share.

The technology we license, our products or our development efforts may be found to infringe upon third-party intellectual property rights.

Third parties may in the future assert claims or initiate litigation related to their patent, copyright, trademark and other intellectual property rights in technology that is important to us. The asserted claims and/or litigation could include claims against us, our licensors or our suppliers alleging infringement of intellectual property rights with respect to our products or components of those products. Regardless of the merit of the claims, they could be time consuming, result in costly litigation and diversion of technical and management personnel, or require us to develop a non-infringing technology or enter into license agreements. We have not undertaken an exhaustive search to discover any third party intellectual patent rights which might be infringed by commercialization of the product candidates described herein. Although we are not currently aware of any such third party intellectual patent rights, it is possible that such rights currently exist or might be obtained in the future. In the event that a third party controls such rights and we are unable to obtain a license to such rights on commercially reasonable terms, we may not be able to sell or continue to develop our products, and may be liable for damages for such infringement. We cannot assure you that licenses will be available on acceptable terms, if at all. Furthermore, because of the potential for significant damage awards, which are not necessarily predictable, it is not unusual to find even arguably unmeritorious claims resulting in large settlements. If any infringement or other intellectual property claim made against us by any third party is successful, or if we fail to develop non-infringing technology or license the proprietary rights on commercially reasonable terms and conditions, our business, operating results and financial condition could be materially adversely affected.

If our products, methods, processes and other technologies infringe the proprietary rights of other parties, we could incur substantial costs and we may have to:

- obtain licenses, which may not be available on commercially reasonable terms, if at all;
- abandon an infringing drug or therapy candidate;
- redesign our products or processes to avoid infringement;
- stop using the subject matter claimed in the patents held by others;
- pay damages; or
- defend litigation or administrative proceedings which may be costly whether we win or lose, and which could result in a substantial diversion of our financial and management resources.

We rely on licenses to use various technologies that are material to our business and if the agreements were to be terminated or if other rights that may be necessary or we deem advisable for commercializing our intended products cannot be obtained, it would halt our ability to market our products and technology, as well as have an immediate material adverse effect on our business, operating results and financial condition.

We have licensing agreements with certain universities granting us the right to use certain critical intellectual property. The terms of the licensing agreements continue until the end of the life of the last patent to expire. If we breach the terms of these licensing agreements, including any failure to make minimum royalty payments required thereunder or failure to reach certain developmental milestones, using best efforts to introduce a licensed product in certain territories by certain dates, the licensor has the right to terminate the license. If we were to lose or otherwise be unable to maintain these licenses on acceptable terms, or find that it is necessary or appropriate to secure new licenses from other third parties, it would halt our ability to market our products and technology, which would have an immediate material adverse effect on our business, operating results and financial condition.

We may be unable to generate sufficient revenues to meet the minimum royalties or developmental milestones required under our license agreements.

For the years ended December 31, 2015, 2016, and 2017 our minimum royalty obligations under our licensing agreements, required to be paid with the passage of time, are $33,000, $38,000 and $338,000, respectively. For the years ended December 31, 2018, 2019 and 2020 our minimum royalty obligations under our licensing agreement, required to be paid with the passage of time, are $38,000, $113,000 and $288,000, respectively. No assurance can be given that we will generate sufficient revenue or raise additional financing to make these minimum royalty payments. The license agreements also provide for certain developmental milestones. No assurance can be given that we will meet all of the required developmental milestones. Any failure to make the payments or reach the milestones required by the license agreements would permit the licensor to terminate the license. If we were to lose or otherwise be unable to maintain these licenses, it would halt our ability to market our products and technology, which would have an immediate material adverse effect on our business, operating results and financial condition.

Our ability to generate product revenues will be diminished if our therapies sell for inadequate prices or patients are unable to obtain adequate levels of reimbursement

Our ability to commercialize our therapies, alone or with collaborators, will depend in part on the extent to which reimbursement will be available from:

- government and health administration authorities;
- private health maintenance organizations and health insurers; and
- other healthcare payers.

Significant uncertainty exists as to the reimbursement status of newly approved healthcare products. Healthcare payers, including Medicare, are challenging the prices charged for medical products and services. Cost control initiatives could decrease the price that we would receive for any products in the future, which would limit our revenue and profitability. Government and other healthcare payers increasingly attempt to contain healthcare costs by limiting both coverage and the level of reimbursement for drugs and therapeutics. We might need to conduct post-marketing studies in order to demonstrate the cost-effectiveness of any future products to such payers' satisfaction. Such studies might require us to commit a significant amount of management time and financial and other resources. Our future products might not ultimately be considered cost-effective. Even if one of our product candidates is approved by the FDA, insurance coverage may not be available, and reimbursement levels may be inadequate, to cover such therapies. If government and other healthcare payers do not provide adequate coverage and reimbursement levels for one of our products, once approved, market acceptance of such product could be reduced.

Legislative and regulatory changes affecting the health care industry could adversely affect our business.

Political, economic and regulatory influences are subjecting the health care industry to potential fundamental changes that could substantially affect our results of operations. In many countries, the government controls the pricing and profitability of prescription pharmaceuticals. In the United States, we expect that there will continue to be federal and state proposals to implement similar governmental controls. In addition, recent changes in the Medicare program and increasing emphasis on managed care in the United States will continue to put pressure on pharmaceutical product pricing. It is uncertain whether or when any legislative proposals will be adopted or what actions federal, state, or private payers for health care treatment and services may take in response to any health care reform proposal or legislation. We cannot predict the effect health care reforms may have on our business and we can offer no assurances that any of these reforms will not have a material adverse effect on our business. These actual and potential changes are causing the marketplace to put increased emphasis on the delivery of more cost-effective treatments. In addition, uncertainly remains regarding proposed significant reforms to the U.S. health care system.

We may not successfully effect our intended expansion

Our success will depend upon the expansion of our operations and the effective management of our growth, which will place a significant strain on our management and on our administrative, operational and financial resources. To manage this growth, we must expand our facilities, augment our operational, financial and management systems and hire and train additional qualified personnel. If we are unable to manage our growth effectively, our business would be harmed.

We may be exposed to liability claims associated with the use of biological and hazardous materials and chemicals

Our research and development activities may involve the controlled use of biological and hazardous materials and chemicals. Although we believe that our safety procedures for using, storing, handling and disposing of these materials comply with federal, state and local laws and regulations, we cannot completely eliminate the risk of accidental injury or contamination from these materials. In the event of such an accident, we could be held liable for any resulting damages and any liability could materially adversely affect our business, financial condition and results of operations. In addition, the federal, state and local laws and regulations governing the use, manufacture, storage, handling and disposal of hazardous or radioactive materials and waste products may require us to incur substantial compliance costs that could materially adversely affect our business, financial condition and results of operations.

We rely on key executive officers and scientific and medical advisors, and their knowledge of our business and technical expertise would be difficult to replace

We are highly dependent on our principal scientific, regulatory and medical advisors and our chief executive officer. Other than a $2,000,000 insurance policy on the life of Jeffrey Wolf, we do not have “key person” life insurance policies for any of our officers or advisors. The loss of the technical knowledge and management and industry expertise of any of our key personnel could result in delays in product development, loss of customers and sales and diversion of management resources, which could adversely affect our operating results.

If we are unable to hire additional qualified personnel, our ability to grow our business may be harmed

We will need to hire additional qualified personnel with expertise in preclinical and clinical research, government regulation, formulation and manufacturing, sales and marketing and accounting and financing. In particular, over the next 12 months, we expect to hire additional new employees. We compete for qualified individuals with numerous biopharmaceutical companies, universities and other research institutions. Competition for such individuals is intense, and we cannot be certain that our search for such personnel will be successful. Attracting and retaining qualified personnel will be critical to our success.

Certain of our officers may have a conflict of interest.

Certain of our officers are currently entitled to devote their time to other activities, which may result in a lack of availability when needed due to responsibilities at other jobs.

We may incur substantial liabilities and may be required to limit commercialization of our products in response to product liability lawsuits.

The testing and marketing of drug and biological product candidates entail an inherent risk of product liability. Product liability claims might be brought against us by consumers, health care providers or others selling or otherwise coming into contact with our products. Clinical trial liability claims may be filed against us for damages suffered by clinical trial subjects or their families. If we cannot successfully defend ourselves against product liability claims, we may incur substantial liabilities or be required to limit commercialization of our products which could impact our ability to continue as a going concern. Our inability to obtain sufficient product liability insurance at an acceptable cost to protect against potential product liability claims could prevent or inhibit the commercialization of pharmaceutical products we develop, alone or with collaborators. In addition, regardless of merit or eventual outcome, product liability claims may result in:

- decreased demand for any approved product candidates;
- impairment of our business reputation;
- withdrawal of clinical trial participants;
- costs of related litigation;
- distraction of management's attention;
- substantial monetary awards to patients or other claimants;
- loss of revenues; and
- the inability to successfully commercialize any approved drug candidates.

International expansion of our business exposes us to business, regulatory, political, operational, financial and economic risks associated with doing business outside of the United States.

Our business strategy incorporates international expansion, including establishing and maintaining clinician marketing and education capabilities outside of the United States and expanding our relationships with distributors and manufacturers. Doing business internationally involves a number of risks, including:

- multiple, conflicting and changing laws and regulations such as tax laws, export and import restrictions, employment laws, regulatory requirements and other governmental approvals, permits and licenses;
- failure by us or our distributors to obtain regulatory approvals for the sale or use of our product candidates in various countries;
- difficulties in managing foreign operations;
- complexities associated with managing multiple payor-reimbursement regimes or self-pay systems;
- limits on our ability to penetrate international markets if our product candidates cannot be processed by a manufacturer appropriately qualified in such markets;
- financial risks, such as longer payment cycles, difficulty enforcing contracts and collecting accounts receivable and exposure to foreign currency exchange rate fluctuations;
- reduced protection for intellectual property rights;
- natural disasters, political and economic instability, including wars, terrorism and political unrest, outbreak of disease, boycotts, curtailment of trade and other business restrictions; and
- failure to comply with the Foreign Corrupt Practices Act, including its books and records provisions and its anti-bribery provisions, by maintaining accurate information and control over sales and distributors' activities.

Any of these risks, if encountered, could significantly harm our future international expansion and operations and, consequently, have a material adverse effect on our financial condition, results of operations and cash flows.

We may acquire other businesses or form joint ventures or make investments in other companies or technologies that could harm our operating results, dilute our stockholders' ownership, increase our debt or cause us to incur significant expense.

As part of our business strategy, we may pursue acquisitions of businesses and assets. We also may pursue strategic alliances and joint ventures that leverage our core technology and industry experience to expand our offerings or distribution. We have no experience with acquiring other companies and limited experience with forming strategic alliances and joint ventures. We may not be able to find suitable partners or acquisition candidates, and we may not be able to complete such transactions on favorable terms, if at all. If we make any acquisitions, we may not be able to integrate these acquisitions successfully into our existing business, and we could assume unknown or contingent liabilities. Any future acquisitions also could result in significant write-offs or the incurrence of debt and contingent liabilities, any of which could have a material adverse effect on our financial condition, results of operations and cash flows. Integration of an acquired company also may disrupt ongoing operations and require management resources that would otherwise focus on developing our existing business. We may experience losses related to investments in other companies, which could have a material negative effect on our results of operations. We may not identify or complete these transactions in a timely manner, on a cost-effective basis, or at all, and we may not realize the anticipated benefits of any acquisition, technology license, strategic alliance or joint venture.

To finance any acquisitions or joint ventures, we may choose to issue shares of our common stock as consideration, which would dilute the ownership of our stockholders. If the price of our common stock is low or volatile, we may not be able to acquire other companies or fund a joint venture project using our stock as consideration. Alternatively, it may be necessary for us to raise additional funds for acquisitions through public or private financings. Additional funds may not be available on terms that are favorable to us, or at all.

Declining general economic or business conditions may have a negative impact on our business.

Continuing concerns over U.S. health care reform legislation and energy costs, geopolitical issues, the availability and cost of credit and government stimulus programs in the United States and other countries have contributed to increased volatility and diminished expectations for the global economy. These factors, combined with low business and consumer confidence and high unemployment, precipitated an economic slowdown and recession. If the economic climate does not improve or continues to deteriorate, our business, as well as the financial condition of our suppliers and our third-party payors, could be adversely affected, resulting in a negative impact on our business, financial condition and results of operations.

The U.S. government may have "march-in rights" to certain of our intellectual property.

Because federal grant monies were used in support of the research and development activities that resulted in certain of our issued pending U.S. patent applications, the federal government retains what are referred to as "march-in rights" to patents that are granted on these applications.

In particular, the National Institutes of Health, which administered grant monies to the primary inventor of the technology we license, technically retain the right to require us, under certain specific circumstances, to grant the U.S. government either a nonexclusive, partially exclusive or exclusive license to the patented invention in any field of use, upon terms that are reasonable for a particular situation. Circumstances that trigger march-in rights include, for example, failure to take, within a reasonable time, effective steps to achieve practical application of the invention in a field of use, failure to satisfy the health and safety needs of the public and failure to meet requirements of public use specified by federal regulations. The National Institutes of Health can elect to exercise these march-in rights on their own initiative or at the request of a third-party.

Risks Related to Our Common Stock

Certain of our officers and directors have sufficient voting power to make corporate governance decisions that could have a significant effect on us and the other stockholders.

As of January 1, 2016, our officers and directors together beneficially own approximately 28.9% of our outstanding common stock on a fully diluted basis. Mr. Wolf, our Chairman of the Board and Chief Executive Officer, alone through his direct and indirect holdings beneficially owns approximately 16.9% of our outstanding common stock on a fully diluted basis. As a result, Mr. Wolf alone will be able to exert a significant degree of influence over our management and affairs and over matters requiring stockholder approval, including the election of directors and approval of significant corporate transactions. In addition, as reported in a Schedule 13G/A filed with the Securities and Exchange Commission on April 10, 2015, our largest shareholder, Franklin Resources, Inc. beneficially owns in excess of 17% of our outstanding common stock and can exert a significant degree of influence over matters requiring stockholder approval. This concentration of ownership may delay or prevent a change in our control and might affect the market price of our common stock, even when a change in control may be in the best interest of all stockholders. Furthermore, the interests of this concentration of ownership may not always coincide with our interests or the interests of other stockholders. Accordingly, these stockholders could cause us to enter into transactions or agreements that we would not otherwise consider.

The possible issuance of common stock subject to options and warrants may dilute the interest of stockholders.

In 2009, we adopted a 2009 Stock Option and Restricted Stock Plan (the "2009 Plan"). In 2014, we adopted a 2014 Stock Incentive Plan (the "2014 Plan") and in 2015 we increased the number of shares of common stock that we have authority to grant under the 2014 Plan. As of December 31, 2015, awards for 1,818,673 shares of common stock have been granted under the 2009 Plan and the 2014 Plan, and there were 453,297 shares of common stock remaining available for grant under these plans. In addition, as of December 31, 2015, we have 17,392 shares issuable upon exercise of warrants granted to third parties in connection with prior private placements of our equity securities and debt which excludes 125,000 shares of common stock issuable at $12.50 per share upon exercise of warrants issued to the underwriters in connection with our initial public offering. To the extent that outstanding stock options and warrants are exercised, or additional securities are issued, dilution to the interests of our stockholders may occur. Moreover, the terms upon which we will be able to obtain additional equity capital may be adversely affected since the holders of the outstanding options can be expected to exercise them at a time when we would, in all likelihood, be able to obtain any needed capital on terms more favorable to us than those provided in such outstanding options.

We have additional securities available for issuance, which, if issued, could adversely affect the rights of the holders of our common stock.

Our Third Amended and Restated Certificate of Incorporation authorizes the issuance of 50,000,000 shares of our common stock and 10,000,000 shares of Preferred Stock. In certain circumstances, the common stock and preferred stock, as well as the awards available for issuance under the 2009 and 2014 Plans, can be issued by our board of directors, without stockholder approval. Any future issuances of such stock (including shares issued upon the exercise of the warrants sold in this offering) would further dilute the percentage ownership of us held by holders of Preferred Stock and common stock. In addition, the issuance of Preferred Stock may be used as an "anti-takeover" device without further action on the part of our stockholders, and may adversely affect the holders of the common stock.

We have never paid dividends and have no plans to pay dividends in the future.

Holders of shares of our common stock are entitled to receive such dividends as may be declared by our board of directors. To date, we have paid no cash dividends on our shares of our preferred or common stock and we do not expect to pay cash dividends in the foreseeable future. We intend to retain future earnings, if any, to provide funds for operations of our business. Therefore, any return investors in our preferred or common stock may have will be in the form of appreciation, if any, in the market value of their shares of common stock.

We are an "emerging growth company," and any decision on our part to comply with certain reduced disclosure requirements applicable to emerging growth companies could make our common stock less attractive to investors.

We are an "emerging growth company," as defined in the Jumpstart Our Business Startups Act enacted in April 2012, and, for as long as we continue to be an emerging growth company, we may choose to take advantage of exemptions from various reporting requirements applicable to other public companies including, but not limited to, not being required to comply with the auditor attestation requirements of Section 404 of the Sarbanes-Oxley Act of 2002, not being required to comply with any new requirements adopted by the Public Company Accounting Oversight Board, or the PCAOB, requiring mandatory audit firm rotation or a supplement to the auditor's report in which the auditor would be required to provide additional information about the audit and the financial statements of the issuer, not being required to comply with any new audit rules adopted by the PCAOB after April 5, 2012 unless the SEC determines otherwise, reduced disclosure obligations regarding executive compensation in our periodic reports and proxy statements, and exemptions from the requirements of holding a nonbinding advisory vote on executive compensation and stockholder approval of any golden parachute payments not previously approved. We could remain an emerging growth company until the earliest of: (i) the last day of the fiscal year in which we have total annual gross revenues of $1 billion or more; (ii) the last day of our fiscal year following the fifth anniversary of the date of our first sale of common equity securities pursuant to an effective registration statement; (iii) the date on which we have issued more than $1 billion in nonconvertible debt during the previous three years; or (iv) the date on which we are deemed to be a large accelerated filer. We cannot predict if investors will find our common stock less attractive if we choose to rely on these exemptions. If some investors find our common stock less attractive as a result of any choices to reduce future disclosure, there may be a less active trading market for our common stock and our stock price may be more volatile. Further, as a result of these scaled regulatory requirements, our disclosure may be more limited than that of other public companies and you may not have the same protections afforded to stockholders of such companies.

Under Section 107(b) of the Jumpstart Our Business Startups Act, emerging growth companies can delay adopting new or revised accounting standards until such time as those standards apply to private companies. We have irrevocably elected not to avail ourselves of this exemption from new or revised accounting standards and, therefore, we will be subject to the same new or revised accounting standards as other public companies that are not emerging growth companies.

As a result of being a public company, we are subject to additional reporting and corporate governance requirements that will require additional management time, resources and expense.

As a public company we are obligated to file with the SEC annual and quarterly information and other reports that are specified in the Exchange Act. We are also subject to other reporting and corporate governance requirements under the Sarbanes-Oxley Act of 2002, as amended, and the rules and regulations promulgated thereunder, all of which impose significant compliance and reporting obligations upon us and require us to incur additional expense in order to fulfill such obligations.

Future sales of our common stock by our existing stockholders could cause our stock price to decline.

As of March 8, 2016 we had 8,424,641 shares of our common stock outstanding, all of which are currently eligible for sale in the public market, subject, in certain circumstances to the volume, manner of sale and other limitations under Rule 144 or 701 promulgated under the Securities Act. It is conceivable that stockholders may wish to sell some or all of their shares. If our stockholders sell substantial amounts of our common stock in the public market at the same time, the market price of our common stock could decrease significantly due to an imbalance in the supply and demand of our common stock. Even if they do not actually sell the stock, the perception in the public market that our stockholders might sell significant shares of our common stock could also depress the market price of our common stock.

A decline in the price of shares of our common stock might impede our ability to raise capital through the issuance of additional shares of our common stock or other equity securities, and may cause stockholders to lose part or all of their investment in our shares of common stock.

Our shares of common stock are from time to time thinly traded, so stockholders may be unable to sell at or near ask prices or at all if they need to sell shares to raise money or otherwise desire to liquidate their shares.

Our common stock has from time to time been "thinly-traded," meaning that the number of persons interested in purchasing our common stock at or near ask prices at any given time may be relatively small or non-existent. This situation is attributable to a number of factors, including the fact that we are a small company that is relatively unknown to stock analysts, stock brokers, institutional investors and others in the investment community that generate or influence sales volume, and that even if we came to the attention of such persons, they tend to be risk-averse and would be reluctant to follow an unproven company such as ours or purchase or recommend the purchase of our shares until such time as we became more seasoned and viable. As a consequence, there may be periods of several days or more when trading activity in our shares is minimal or non-existent, as compared to a seasoned issuer that has a large and steady volume of trading activity that will generally support continuous sales without an adverse effect on share price. We cannot give stockholders any assurance that a broader or more active public trading market for our common shares will develop or be sustained, or that current trading levels will be sustained.

Our limited trading market has in the past and may continue to cause volatility in our share price.

Our stock is thinly traded in part due to a limited number of shares available for trading thus causing large swings in price. As such, investors may find it difficult to obtain accurate stock price quotations and holders of our stock may be unable to resell their stock at desirable prices. If an active market develops, our stock price may nevertheless remain volatile. Sales of substantial amounts of our common stock, or the perception that such sales might occur, could adversely affect prevailing market prices of our common stock and our stock price may decline substantially in a short period of time. As a result, our stockholders could suffer losses or be unable to liquidate holdings.

Certain provisions of the General Corporation Law of the State of Delaware may have anti-takeover effects which may make an acquisition of our company by another company more difficult.

We are subject to the provisions of Section 203 of the General Corporation Law of the State of Delaware, which prohibits a Delaware corporation from engaging in any business combination, including mergers and asset sales, with an interested stockholder (generally, a 15% or greater stockholder) for a period of three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. The operation of Section 203 may have anti-takeover effects, which could delay, defer or prevent a takeover attempt that a holder of our common stock might consider in its best interest.

Our failure to meet the continued listing requirements of the NASDAQ Capital Market could result in a de-listing of our common stock.

Our shares of common stock are currently listed on the NASDAQ Capital Market. If we fail to satisfy the continued listing requirements of the NASDAQ Capital Market, such as the corporate governance requirements, minimum bid price requirement or the minimum stockholder's equity requirement, the NASDAQ Capital Market may take steps to de-list our common stock. Such a de-listing would likely have a negative effect on the price of our common stock and would impair our stockholders' ability to sell or purchase our common stock when they wish to do so. In the event of a de-listing, we would take actions to restore our compliance with the NASDAQ Capital Market's listing requirements, but we can provide no assurance that any action taken by us would result in our common stock becoming listed again, or that any such action would stabilize the market price or improve the liquidity of our common stock. On February 22, 2016, we received a deficiency letter from the NASDAQ Capital Market indicating that as of December 31, 2015 our stockholder's equity of $2,495,000 did not meet the $2,500,000 minimum required to maintain continued listing. Although the proceeds of this offering will satisfy the continued listing requirements of the NASDAQ Capital Market, there can be no assurance that we will continue to satisfy such requirements.

Reports published by securities or industry analysts, including projections in those reports that exceed our actual results, could adversely affect our common stock price and trading volume.

Securities research analysts, including those affiliated with our underwriters, establish and publish their own periodic projections for our business. These projections may vary widely from one another and may not accurately predict the results we actually achieve. Our stock price may decline if our actual results do not match securities research analysts' projections. Similarly, if one or more of the analysts who writes reports on us downgrades our stock or publishes inaccurate or unfavorable research about our business or if one or more of these analysts ceases coverage of our company or fails to publish reports on us regularly, our stock price or trading volume could decline. While we expect securities research analyst coverage following this offering, if no securities or industry analysts begin to cover us, the trading price for our stock and the trading volume could be adversely affected.

Risks Related to this Offering

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

The public offering price per share of our common stock and related warrant will be substantially higher than the net tangible book value per share of our common stock immediately prior to the offering. After giving effect to the assumed sale of shares of our common stock and related warrants in this offering, at an assumed combined public offering price of $0.94 per share and related warrant (the last reported sale price of our common stock on the NASDAQ Capital Market on March 7, 2016), and after deducting the estimated underwriting discount and estimated offering expenses payable by us and attributing no value to the warrants sold in this offering, purchasers of our common stock in this offering will incur immediate dilution of $0.37 per share in the net tangible book value of the common stock they acquire. In the event that you exercise your warrants, you will experience additional dilution to the extent that the exercise price of the warrants is higher than the tangible book value per share of our common stock. For a further description of the dilution that investors in this offering will experience, see "Dilution."

In addition, to the extent that outstanding stock options or warrants have been or may be exercised or other shares issued, you may experience further dilution.

Our management will have broad discretion over the use of proceeds from this offering and may not use the proceeds effectively.

Our management will have broad discretion over the use of proceeds from this offering. The net proceeds from this offering will be used to continue to fund our current Phase 2 trial of HS-410 for the treatment of NMIBC; to advance the current patients enrolled in our current Phase 1b trial evaluating HS-110 in combination with nivolumab, a Bristol-Myers Squibb PD-1 checkpoint inhibitor, for the treatment of NSCLC through the reporting of topline data; and working capital and general corporate purposes. Our management will have considerable discretion in the application of the net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. The net proceeds may be used for corporate purposes that do not improve our operating results or enhance the value of our common stock.

Our need for future financing may result in the issuance of additional securities which will cause investors to experience dilution

Our cash requirements may vary from those now planned depending upon numerous factors, including the result of future research and development activities. We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development and initiate and conduct clinical trials of, and seek marketing approval for, our product candidates. In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. There are no other commitments by any person for future financing. Our securities may be offered to other investors at a price lower than the price per share offered to current stockholders, or upon terms which may be deemed more favorable than those offered to current stockholders. In addition, the issuance of securities in any future financing may dilute an investor's equity ownership and have the effect of depressing the market price for our securities. Moreover, we may issue derivative securities, including options and/or warrants, from time to time, to procure qualified personnel or for other business reasons. The issuance of any such derivative securities, which is at the discretion of our board of directors, may further dilute the equity ownership of our stockholders. No assurance can be given as to our ability to procure additional financing, if required, and on terms deemed favorable to us. To the extent additional capital is required and cannot be raised successfully, we may then have to limit our then current operations and/or may have to curtail certain, if not all, of our business objectives and plans.

Sales of additional shares of common stock, including by us or our directors and officers following expiration or early release of the lock-up periods, could cause the price of our common stock to decline.

Sales of substantial amounts of our common stock in the public market, or the availability of such shares for sale, by us or by others, including the issuance of shares of common stock upon the exercise of outstanding options and warrants, could adversely affect the price of our common stock. In connection with this offering, we and our directors and officers have entered into lock-up agreements for a period of 90 days following this offering. We and our directors and officers may be released from the lock-up prior to its expiration period at the sole discretion of the representative of the underwriters. See "Underwriting." Upon expiration or earlier release of the lock-up, we and our directors and officers may sell shares of our common stock into the market, which could adversely affect the market price of our common stock.

Holders of our warrants will have no rights as a common stockholder until they acquire our common stock.

Until you acquire shares of our common stock upon exercise of your warrants, you will have no rights with respect to shares of our common stock issuable upon exercise of your warrants. Upon exercise of your warrants, you will be entitled to exercise the rights of a common stockholder only as to matters for which the record date occurs after the exercise date.

The warrants may not have any value.

Each warrant will have an exercise price per share not less than 100% of the closing bid price of our common stock on the trading day immediately preceding the pricing of this offering and will expire on the fifth anniversary of the date they first become exercisable. In the event our common stock price does not exceed the exercise price of the warrants during the period when the warrants are exercisable, the warrants may not have any value.

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

There is no established trading market for the warrants and we do not expect a market to develop. In addition, we do not intend to apply for the listing of the warrants on any national securities exchange or other trading market. Without an active trading market, the liquidity of the warrants will be limited.

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains forward-looking statements, including statements regarding the progress and timing of our product development, the goals of our development activities, estimates of the potential markets for our product candidates, estimates of the capacity of manufacturing and other facilities to support our products, our expected future revenues, operations and expenditures and projected cash needs. The forward-looking statements are contained principally in the sections entitled "Prospectus Summary," "Risk Factors," "Management's Discussion and Analysis of Financial Condition and Results of Operations" and "Business." These statements relate to future events of our financial performance and involve known and unknown risks, uncertainties and other factors that could cause our actual results, levels of activity, performance or achievement to differ materially from those expressed or implied by these forward-looking statements. Those risks and uncertainties include, among others:

- our ability to implement our business plan;
- our ability to raise additional capital to meet our liquidity needs;
- our ability to generate product revenues;
- our ability to achieve profitability;
- our ability to comply with our loan covenants;
- our ability to satisfy U.S. (including FDA) and international regulatory requirements;
- our ability to obtain market acceptance of our technology and products;
- our ability to compete in the market;
- our ability to advance our clinical trials;
- our ability to fund, design and implement clinical trials;
- our ability to demonstrate that our product candidates are safe for human use and effective for indicated uses;
- our ability to gain acceptance of physicians and patients for use of our products;
- our dependency on third-party researchers and manufacturers and licensors;
- our ability to establish and maintain strategic partnerships, including for the distribution of products;
- our ability to attract and retain sufficient, qualified personnel;
- our ability to obtain or maintain patents or other appropriate protection for the intellectual property;
- our dependency on the intellectual property licensed to us or possessed by third parties;
- our ability to adequately support future growth; and
- potential product liability or intellectual property infringement claims.

Forward-looking statements include all statements that are not historical facts. In some cases, you can identify forward-looking statements by terms such as "may," "will," "should," "could," "would," "expects," "plans," "anticipates," "believes," "estimates," "projects," "predicts," "potential," or the negative of those terms, and similar expressions and comparable terminology intended to identify forward-looking statements. These statements reflect our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. These forward-looking statements represent our estimates and assumptions only as of the date of this prospectus and, except as required by law, we undertake no obligation to update or review publicly any forward-looking statements, whether as a result of new information, future events or otherwise after the date of this prospectus. You should read this prospectus and the documents referenced in this prospectus and filed as exhibits to the registration statement, of which this prospectus is a part, completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of our forward-looking statements by these cautionary statements.

USE OF PROCEEDS

We estimate that the net proceeds of this offering will be approximately $7.1 million, assuming the sale of 8,510,638 shares of our common stock and warrants at an assumed combined public offering price of $0.94 per share (the last reported sale price of our common stock on the NASDAQ Capital Market on March 7, 2016) after deducting the estimated underwriting discount and estimated offering expenses payable by us, and excluding the proceeds, if any, from the exercise of the warrants.

A $0.25 increase (decrease) in the assumed combined public offering price of $0.94 per share would increase (decrease) the expected net proceeds of the offering to us by approximately $2.0 million, assuming that the number of shares and warrants sold by us remains the same. We may also increase or decrease the number of shares of our common stock and warrants we are offering. An increase (decrease) of 1 million in the number of shares sold in this offering would increase (decrease) the expected net proceeds of the offering to us by approximately $0.9 million, assuming that the assumed combined public offering price per share and related warrant remains the same.

We intend to use the net proceeds from this offering as follows:

- approximately $3.2 million for completion of Phase 2 clinical trials of HS-410 in bladder cancer;
- approximately $ 3.0 million to advance the current patients enrolled in our Phase 1b trial evaluating HS-110 in combination with a PD-1 checkpoint inhibitor for the treatment of non-small lung cancer through the reporting of topline data; and
- the remaining net proceeds will be used for working capital and general corporate purposes.

The expected use of the net proceeds from this offering represents our current intentions based on our present plans and business conditions. As of the date of this prospectus, we cannot specify with certainty all of the particular uses for the net proceeds to be received from this offering. The amounts and timing of our actual expenditures will depend on numerous factors including the progress in, and costs of, our clinical trials and other preclinical development programs and the amount of funding, if any, received from grants. Accordingly, our management will have broad discretion in the application of the net proceeds, and investors will be relying on the judgment of management regarding the application of the net proceeds from the offering. We may find it necessary or advisable to reallocate the net proceeds of this offering; however, any such reallocation would be substantially limited to the categories set forth above as we do not intend to use the net proceeds for other purposes. Pending such uses set forth above, we plan to invest the net proceeds in government securities and other short-term investment grade, marketable securities.

DIVIDEND POLICY

We have never declared or paid any cash dividends on our capital stock and we do not currently intend to pay any cash dividends on our common stock in the foreseeable future. We expect to retain all available funds and future earnings, if any, to fund the development and growth of our business. Any future determination to pay dividends, if any, on our common stock will be at the discretion of our board of directors and will depend on, among other factors, our results of operations, financial condition, capital requirements and contractual restrictions.

DILUTION

If you purchase shares of our common stock in this offering, you will experience dilution to the extent of the difference between the combined public offering price per share and related warrant in this offering and our as adjusted net tangible book value per share immediately after this offering assuming no value is attributed to the warrants, and such warrants are accounted for and classified as equity. Net tangible book value per share is equal to the amount of our total tangible assets, less total liabilities, divided by the number of outstanding shares of our common stock. As of December 31, 2015, our net tangible book value was approximately $2,495,000, or approximately $0.30 per share.

After giving effect to the assumed sale by us of 8,510,638 shares of our common stock and warrants to purchase shares of our common stock in this offering at an assumed combined public offering price of $0.94 per share and related warrant (the last reported sale price of our common stock on the NASDAQ Capital Market on March 7, 2016), and after deducting the estimated underwriting discount and estimated offering expenses payable by us, our as adjusted net tangible book value as of December 31, 2015 would have been approximately $9.6 million, or approximately $0.57 per share. This represents an immediate increase in net tangible book value of $0.27 per share to existing stockholders and an immediate dilution of $0.37 per share to new investors purchasing shares of our common stock and related warrants in this offering, attributing none of the assumed combined public offering price to the warrants offered hereby. The following table illustrates this per share dilution:

Assumed combined public offering price per share and related warrant		$ 0.94
Net tangible book value per share as of December 31, 2015	$ 0.30	
Increase in net tangible book value per share after this offering	$ 0.27	
As adjusted net tangible book value per share after giving effect to this offering		0.57
Dilution per share to new investors		$ 0.37

A $0.25 increase (decrease) in the assumed combined public offering price of $0.94 per share and related warrant would result in an incremental increase (decrease) in our as adjusted net tangible book value of approximately $2 million or approximately $0.11 per share, and would result in an incremental increase (decrease) in the dilution to new investors of approximately $0.11 per share, assuming that the number of shares of our common stock and related warrants sold by us remains the same and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

We may also increase or decrease the number of shares of common stock and related warrants we are offering from the assumed number of share of common stock and related warrants set forth above. An increase of 1.0 million in the assumed number of shares of common stock and related warrants sold by us in this offering would result in an incremental increase in our as adjusted net tangible book value of approximately $0.9 million or approximately $0.01 per share, and would result in an incremental increase in the dilution to new investors of approximately $0.01 per share, assuming that the assumed combined public offering price remains the same and after deducting the estimated underwriting discount and estimated offering expenses payable by us. A decrease of 1.0 million in the assumed number of shares of common stock and related warrants sold by us in this offering would result in an incremental decrease in our as adjusted net tangible book value of approximately $0.9 million or approximately $0.01 per share, and would result in an incremental decrease in the dilution to new investors of approximately $0.01 per share, assuming that the assumed combined public offering price remains the same and after deducting the estimated underwriting discount and estimated offering expenses payable by us. The information discussed above is illustrative only and will adjust based on the actual public offering price, the actual number of shares and related warrants sold in this offering and other terms of this offering determined at pricing.

The foregoing discussion and table do not take into account further dilution to new investors that could occur upon the exercise of outstanding options or warrants having a per share exercise price less than the per share offering price to the public in this offering. In addition, we may choose to raise additional capital due to market conditions or strategic considerations even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

The table and discussion above are based on 8,424,641 shares of common stock issued and outstanding as of December 31, 2015 and excludes as of that date:

- 1,214,686 shares of our common stock issuable upon the exercise of outstanding stock options with a weighted average exercise price of $4.93 per share;
- 142,392 additional shares of our common stock issuable upon the exercise of outstanding warrants at a weighted average exercise price of $11.03 per share; and
- 453,297 additional shares of our common stock reserved for future issuance under our equity incentive plans.

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

The following discussion and analysis should be read in conjunction with our audited and unaudited consolidated financial statements and the related notes that appear elsewhere in this prospectus. This discussion contains forward-looking statements reflecting our current expectations that involve risks and uncertainties. Actual results may differ materially from those discussed in these forward-looking statements due to a number of factors, including those set forth in the section entitled "Risk Factors", "Special Note Regarding Forward-Looking Statements" and elsewhere in this prospectus.

Company Overview

We are an immuno-oncology company developing novel therapies intended to activate a patient's immune system to fight cancer. Using our T cell-stimulating platform technologies, *ImPACT*® (Immune Pan-Antigen Cytotoxic Therapy) and *ComPACT*™ (Combination Pan-Antigen Cytotoxic Therapy), we have generated several product candidates that we believe may be effective in treating certain forms of cancer. Our platform technologies address two synergistic mechanisms of action: activation of CD8+ T cells, or "killer" T cells; and T cell co-stimulation. We believe the use of these technologies has the potential to enhance patients' natural immune response against certain cancers.

Using our *ImPACT*® platform technology, we have developed product candidates that consist of live, genetically-modified, irradiated human cancer cells which secrete a broad spectrum of tumor-associated antigens ("TAAs") together with a potent immune response stimulator called "gp96." The secreted antigen-gp96/TAA complexes activate a patient's immune system to recognize and kill cancer cells that express the TAAs included in the product candidates, which we have engineered to address the most prevalent TAAs present in the "tumor signature" of a specific cancer.

Our *ComPACT*™ platform technology enables us to combine a pan-antigen T cell activating vaccine and a T cell co-stimulator in a single product, offering the potential benefits of combination immunotherapy without the need for multiple independent biologic products. Using *ComPACT*™, we have engineered new product candidates that incorporate various ligand fusion proteins targeting co-stimulatory receptors (OX40, ICOS, 4-1BB) into the gp96-Ig expression vector, resulting in a single product candidate that includes both a pan-antigen T cell priming vaccine and a T cell co-stimulator.

Using our platform technologies, we produce product candidates from allogeneic cell lines selected to express the broadest array of commonly shared tumor antigens for a specified type of cancer. Unlike autologous or "personalized" therapeutic vaccine approaches that require the extraction of blood or tumor tissue from each patient and the creation of an individualized treatment, our product candidates are fully allogeneic, do not require extraction of individual patient's material or custom manufacturing. As a result, our product candidates can be mass-produced and readily available for immediate patient use. Because each patient receives the same treatment, we believe that our immunotherapy approach offers logistical, manufacturing and other cost benefits compared to one-off, patient-specific approaches.

Using our *ImPACT*™ platform technology, we have developed HS-410 (vesigenurtacel-L) as a product candidate to treat non-muscle invasive bladder cancer ("NMIBC") and HS-110 (viagenpumatucel-L), intended for use in combination with an anti-PD-1 checkpoint inhibitor, as a potential treatment for patients with non-small cell lung cancer ("NSCLC"). To-date, we have administered in excess of 1,000 doses of HS-410 and HS-110 collectively in approximately 200 patients. We are currently conducting a Phase 2 trial of HS-410 in patients with NMIBC and a Phase 1b trial of HS-110, in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb's PD-1 checkpoint inhibitor, to treat patients with NSCLC. Using our *ComPACT*™ platform technology, we have developed HS-120 as a potential treatment for NSCLC. We expect to file an Investigational New Drug, or IND, submission for our first *ComPACT*™ product candidate for NSCLC (HS-120) in the second half of 2016.

Our lead product candidates are HS-410 and HS-110. Currently, we have completed enrollment in the blinded, randomized arms of our Phase 2 trial with HS-410 in patients with NMIBC, and are conducting a Phase 1b trial of HS-110 in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. We are devoting substantially all of our resources to developing HS-410 and HS-110/HS-120 including conducting clinical trials, providing general and administrative support for these operations and protecting our intellectual property. We currently do not have any products approved for sale and we have not generated any significant revenue from product sales since our inception. We expect to continue to incur significant expenses and to incur increasing operating losses for at least the next several years. We anticipate that our expenses will increase substantially as we:

- complete the ongoing clinical trials of our lead product candidates;
- maintain, expand and protect our intellectual property portfolio;
- seek to obtain regulatory approvals for our product candidates;
- continue our research and development efforts;
- add operational, financial and management information systems and personnel, including personnel to support our product development and commercialization efforts; and
- operate as a public company.

We commenced active operations in June 2008. Our operations to date have been primarily limited to organizing and staffing our company, business planning, raising capital, acquiring and developing our technology, identifying potential product candidates and undertaking preclinical and clinical studies of our most advanced product candidates. To date, we have not generated any revenues and have financed our operations with net proceeds from the private placement of our preferred stock, our initial public offering in which we received gross proceeds of $27 million, our last public offering that was completed on March 16, 2015 (the "Offering") of 1,886,000 shares of our common stock at a closing price of $6.50 per share for gross proceeds of $12.3 million and net proceeds to us of approximately $11.1 million and $7.5 million received from our debt facility with Square 1 Bank. Our consolidated financial statements for the years ended December 31, 2015 and 2014 have been prepared on a going concern basis. As of December 31, 2015, we had an accumulated deficit of $44.4 million. We had net losses of $21.1 million and $12.2 million for the years ended December 31, 2015 and 2014, respectively. We expect to incur significant expenses and increasing operating losses for the foreseeable future. We expect our expenses to increase in connection with our ongoing activities, particularly as we continue the research and development and initiate and conduct clinical trials of, and seek marketing approval for, our product candidates. In addition, if we obtain marketing approval for any of our product candidates, we expect to incur significant commercialization expenses related to product sales, marketing, manufacturing and distribution. These factors raise substantial doubt about our ability to continue as a going concern. Accordingly, we will need to obtain substantial additional funding in connection with our continuing operations. Adequate additional financing may not be available to us on acceptable terms, or at all. If we are unable to raise capital when needed or on attractive terms, we would be forced to delay, reduce or eliminate our research and development programs or any future commercialization efforts. To meet our capital needs, we are considering multiple alternatives, including but not limited to, additional equity financings, debt financings and/or funding from partnerships and collaborations. This is based on our current estimates, and we could use our available capital resources sooner than we currently expect. We will need to generate significant revenues to achieve profitability, and we may never do so.

HS-410

HS-410 (vesigenurtacel-L) is a biologic product candidate comprising a cancer cell line genetically modified using our*ImPACT*® technology platform to secrete a wide range of cancer antigens related to bladder cancer bound to gp96 molecules. We believe that HS-410 has the potential to activate a T cell mediated pan-antigen immune response that could be an effective treatment for patients with NMBIC.

We are currently conducting a Phase 2 trial evaluating HS-410 either alone or in combination with intravesical standard of care, Bacillus Calmette-Guérin (BCG), for the treatment of high-risk, NMIBC. The primary endpoint is one-year disease free survival. Heat completed enrollment for the Phase 2 trial's three randomized, combination arms and anticipates reporting topline efficacy, immune-response and safety data in the fourth quarter of 2016.

On February 25, 2016, we announced that we will no longer enroll new patients in our Phase 2 monotherapy trial arm evaluating HS-410 alone for the treatment of NMIBC. We added the monotherapy trial arm in response to the intermittent global shortage of standard of care BCG in early 2015. The shortage has since then been resolved and as such, we will no longer enroll new patients in this trial arm based on discussions with the U.S. FDA. The decision does not relate to concerns regarding the safety profile of HS-410. The 16 patients currently enrolled, out of the anticipated 25 patients, can continue receiving HS-410 monotherapy per the study protocol. We anticipate reporting topline 6-month data from these 16 patients in the fourth quarter of 2016, contemporaneous with reporting data from the company's three randomized Phase 2 trial arms evaluating HS-410 in combination with BCG.

On February 10, 2016, we announced that the U.S. FDA had lifted the partial clinical hold on our HS-410 Phase 2 clinical trial and that patient enrollment had resumed; clinical timelines were materially unchanged. On February 3, 2016, we announced that we had concluded that the cell line on which HS-410 is based, which is a prostate cancer cell line, had been previously misidentified as a bladder cancer cell line, that we had advised the U.S. FDA of this conclusion and that the U.S. FDA had placed our HS-410 Phase 2 clinical trial on partial clinical hold while they reviewed certain updated documentation provided by us related to the misidentification. The misidentification related to the origin of the cell line and not to the antigen profile or other characteristics of the cell line, which have been accurately characterized throughout the clinical development of HS-410. The partial clinical hold did not relate to concerns regarding the safety and efficacy of HS-410. All data generated and reported remained unchanged, including HS-410's positive safety profile, immune response and shared antigenic profile with patient tumors. Upon becoming aware of the misidentification, we amended all of the documentation necessary to correct the error, including the related investigator brochure, study protocol and informed consent form. Due to the short duration of the clinical hold, we do not expect any material change in our clinical timelines. In addition, we do not expect that the misidentification will have any adverse effect on the future clinical development of HS-410. While our rights to the prostate cancer cell line are non-exclusive, we believe that our intellectual property portfolio, which we expect to be unaffected by the misidentification, will provide us with appropriate protection for the development and potential commercialization of HS-410.

In January 2016, we reported three-month interim data from the unblinded, monotherapy cohort of our ongoing Phase 2 trial of HS-410 for the treatment of NMIBC at the Phacilitate Immunotherapy World Conference. In the monotherapy arm, a series of weekly intradermal injections of HS-410 is being dosed as an alternative to BCG. Images of the bladder taken from several treated patients showed changes that resemble lymphoid (T cell rich) structures that we have observed in biopsy samples, which we believe indicates that HS-410 is generating an immune response as expected. Six out of seven patients in the monotherapy arm, who had reached the 3-month timepoint after treatment with HS-410 alone, remained recurrence free. One of those patients had *carcinoma in situ* (*CIS*) – the patient population believed to be least responsive to BCG – and that patient experienced complete response.

In November 2015, we announced the results from our Phase 1 trial, evaluating the safety and immune response of HS-410, after surgery and treatment with BCG, in patients with high-risk NMIBC. In that trial, HS-410 exhibited a positive safety profile and was well-tolerated with no serious adverse events (SAEs) and no patients discontinuing the trial due to adverse events (AEs). 7 out of the 10 patients had no documented recurrence of cancer >1 year after treatment. 3 out of 4 patients with *CIS* did not experience a recurrence one year after treatment. In the study subjects, HS-410 elicited a broad-based (polyclonal) expansion of patient T cells and a high level of CD8+ tumor-infiltrating lymphocytes (TILs). Additionally, based on tissue samples taken from each patient, HS-410 shared 15 or more tumor antigens in common with those expressed on the patients' cancer cells, which we believe supports our belief that HS-410 has the ability to target a broad range of tumor antigens. These data confirm previous preclinical findings regarding the unique mechanism of action for HS-410. Moreover, third-party analysis of blinded samples from the trial demonstrated a strong correlation between baseline characteristics of TILs by T cell receptor (TCR) sequencing and clinical outcome. Specifically, the 7 patients who remained disease free after one year exhibited the greatest clonal expansion of intratumoral T cells (p-value 0.0126).

In October 2015, we completed enrollment of our 75-patient, blinded, randomized, placebo-controlled arms of our ongoing Phase 2 clinical trial evaluating HS-410 in combination with BCG in patients with high risk NMIBC. Our Phase 2 trial will examine safety, tolerability, immune response and preliminary clinical activity of HS-410. The primary endpoint is one-year disease free survival. We expect to report topline efficacy, immune-response and safety results in the fourth quarter of 2016.

In March 2015, the U.S. Food and Drug Administration ("FDA") granted Fast Track designation for HS-410 for the treatment of NMIBC. The Fast Track program is designed to facilitate the development and expedite the review of therapies intended to treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs. The advantages of Fast Track designation include actions to expedite development, including opportunities for frequent interactions with the FDA review team to discuss all aspects of developments to support approval and eligibility for priority review depending on clinical data at the time of Biologics License Application ("BLA") submission. We believe that this designation will expedite our development of HS-410.

HS-110

HS-110 (viagenpumatucel-L) is a biologic product candidate comprising a cancer cell line that has been genetically modified using our *ImPACT*® technology platform to secrete a wide range of cancer associated antigens related to lung cancer bound to gp96 proteins. We believe that HS-110 has the potential to activate a T-cell mediated pan-antigen immune response that could be an effective treatment for patients with NSCLC.

We are conducting a Phase 1b clinical trial evaluating HS-110 nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. The multicenter, open label trial is expected to initially enroll 18 patients and is designed to accommodate cohort expansion up to 30 patients in total. The purpose of the trial is to evaluate the safety and efficacy of HS-110 in combination with nivolumab, an FDA approved anti-PD-1 checkpoint inhibitor, in patients with NSCLC whose cancers have progressed after first-line therapy. Primary and secondary trial endpoints include safety and tolerability, immune response, overall response rate and progression-free survival. Top-line objective response rate and 6-month progression free survival (PFS) data are expected by the end of 2016 for these first 18 patients.

We also are conducting a Phase 2 clinical trial evaluating HS-110 in combination with low dose cyclophosphamide versus chemotherapy alone as a potential third-line or fourth-line treatment in patients with NSCLC. We completed enrollment of 66 patients in this study in September 2015. These patients will be followed for immune response and overall survival with data expected to be reported in the fourth quarter of 2016.

The inventor of the *ImPACT*® technology that we licensed in February 2013 reported results from a Phase 1 open-label, single center clinical trial of HS-110 in patients with advanced NSCLC. We believe the results provide clinical evidence that HS-110 is capable of generating anti-cancer immune responses. In the study, 18 patients were vaccinated and 15 of the 18 treated patients completed the first course of three planned courses of therapy. Two patients completed all three planned courses of therapy (defined as three, six week treatment cycles). In that trial, HS-110 showed no overt toxicity. There were no SAEs that were considered by the trial investigator to be treatment- related. Most of the AEs were reported as mild or moderate (grade 1 or 2) with the most frequent being injection site reactions and rashes that were transitory and usually resolved in one to two weeks. Eleven of the fifteen patients (73%) who completed the first course of therapy with HS-110, exhibited a two-fold or greater increase in CD8+ cells secreting interferon gamma (CD8-CTL IFN- γ). The estimated median survival of these eleven patients was 16.5 months (95% CI:7.1-20.0). In comparison, the 4 patients who failed to show increased CD8-CTL IFN-γ responses survived 2.1, 2.3, 6.7, and 6.7 months, or a median survival of 4.5 months, which is consistent with the expected survival times in this patient population. In 7 of 18 treated patients, tumor growth was stabilized, however no partial or complete tumor responses (e.g., reduction or disappearance of tumors) were observed in any of the 18 patients. The median one-year overall survival rate of patients in the study was 44% (95% CI:21.6-65.1), comparing favorably to a 5.5% rate based on published historical data from an unrelated 43-patient advanced lung cancer population. One of the late-stage lung cancer patients survived over four years since starting therapy and another patient survived over three years since starting therapy. These findings were consistent with multiple preclinical published studies on *ImPACT*® therapy.

Additional Indications

We continue to evaluate other potential indications for our*ImPACT*® and *ComPACT*™ platform technologies. Specifically, using *ComPACT*™, we have developed cell lines for several other cancers with the first product candidate being a second-generation therapy for non-small cell lung cancer (HS-120). Our decision to further pursue these product candidates or any additional product candidates other than our two lead product candidates will be based in part upon available funding and partnering opportunities. On February 18, 2015, we announced a collaboration with OncoSec Medical Inc. to evaluate the feasibility of OncoSec's ImmunoPulse *in vivo* electroporation technology for intra-tumoral delivery of gp96-Ig encoding DNA plasmids to activate specific immune responses against 'private,' mutation-derived tumor neo-antigens. This collaboration is ongoing, and we will announce data demonstrating that intratumoral electroporation of *ComPACT*™ plasmid DNA leads to release of tumor specific neo antigens in the first half of 2016.

CRITICAL ACCOUNTING POLICIES AND SIGNIFICANT JUDGMENTS AND ESTIMATES

We believe that several accounting policies are important to understanding our historical and future performance. We refer to these policies as "critical" because these specific areas generally require us to make judgments and estimates about matters that are uncertain at the time we make the estimate, and different estimates—which also would have been reasonable—could have been used, which would have resulted in different financial results.

Our management's discussion and analysis of financial condition and results of operations is based on our consolidated financial statements, which have been prepared in accordance with U.S. GAAP. The preparation of our consolidated financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenue and expenses and related disclosure of contingent assets and liabilities. On an ongoing basis, we evaluate our estimates based on historical experience and make various assumptions, which management believes to be reasonable under the circumstances, which form the basis for judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

The notes to our audited consolidated financial statements contain a summary of our significant accounting policies. We consider the following accounting policies critical to the understanding of the results of our operations:

- Stock-based compensation;
- Clinical and regulatory cost; and
- Research and development costs.

Stock-Based Compensation

Calculating stock-based compensation expense requires the input of highly subjective assumptions. We apply the Black-Scholes-Merton option pricing model to determine the fair value of our stock options. Inherent in this model are assumptions related to expected stock-price volatility, expected option life, risk-free interest rate and dividend yield. As a newly public company we do not have sufficient history to estimate the volatility of our common stock, therefore we have elected to utilize a peer group of similar publicly traded companies for which the historical information is available. We estimate the expected life of our options using the simplified method. The risk-free interest rate is based on the U.S. Treasury zero-coupon yield curve on the grant date for a maturity similar to the expected life of the options. The dividend rate is based on our historical rate, which we anticipate to remain at zero. The assumptions used in calculating the fair value of stock options represent our best estimates, however these estimates involve inherent uncertainties and the application of management judgment. As a result, if factors change and different assumptions are used, the stock-based compensation expense could be materially different in the future. In addition, we are required to estimate the expected forfeiture rate and only recognize expense for those stock options expected to vest over the service period.

Research and Development Costs

We expense research and development costs associated with developmental products not yet approved by the FDA to research and development expense as incurred. Research and development costs consist primarily of license fees (including upfront payments), milestone payments, pre-manufacturing costs, salaries, stock-based compensation and related personnel costs, fees paid to consultants and outside service providers for legal expenses resulting from intellectual property prosecution and other expenses relating to the design, development, and testing and enhancement of our product candidates.

Clinical and Regulatory Costs

We expense clinical and regulatory costs associated with bringing our developmental products into advanced phase clinical trials as incurred. Clinical and regulatory costs consist of clinical trial execution, investigator payments, drug manufacturing, testing, storage, packaging, shipping, regulatory activities, salaries, stock-based compensation and related personnel costs, fees paid to consultants and outside service providers related to the development of our product candidates.

Recent Accounting Pronouncements

In August 2014, Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") 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 2014-15"). The amendments in ASU 2014-15 are intended to define management's responsibility to evaluate whether there is substantial doubt about an organization's ability to continue as a going concern and to provide related footnote disclosures if there is substantial doubt about its ability to continue as a going concern. The pronouncement is effective for annual periods ending after December 15, 2016 with early adoption permitted. The adoption of this guidance is not expected to have a material impact on our consolidated financial statements.

In January 2015, the FASB issued ASU No. 2015-1,*Income Statement - Extraordinary and Unusual Items.* ASU 2015-01 will eliminate from U.S. GAAP the concept of extraordinary items and will no longer require an entity to separately classify, present, and disclose extraordinary events and transactions. ASU 2015-01 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2015, and early adoption is permitted provided that the guidance is applied from the beginning of the fiscal year of adoption. We do not believe the adoption of this guidance will have a material impact on our consolidated financial statements or related footnote disclosures.

In April 2015, the FASB issued ASU 2015-03, Interest -*Imputation of Interest (Subtopic 835-30): Simplifying the Presentation of Debt Issuance Costs,*ASU 2015-03 revises Subtopic 835-30 to require that debt issuance costs be reported in the balance sheet as a direct deduction from the face amount of the related liability, consistent with the presentation of debt discounts. Prior to the amendments, debt issuance costs were presented as a deferred charge (i.e., an asset) on the balance sheet. The ASU provides examples illustrating the balance sheet presentation of notes net of their related discounts and debt issuance costs. Further, the amendments require the amortization of debt issuance costs to be reported as interest expense. Similarly, debt issuance costs and any discount or premium are considered in the aggregate when determining the effective interest rate on the debt. The amendments are effective for public business entities for fiscal years beginning after December 15, 2015, and interim periods within those fiscal years. The amendments are effective for all other entities for fiscal years beginning after December 15, 2015, and interim periods within fiscal years beginning after December 15, 2016. The amendments must be applied retrospectively. All entities have the option of adopting the new requirements as of an earlier date for financial statements that have not been previously issued. The Company does not expect this ASU to have a material impact on our consolidated financial statements.

In January 2016, the FASB issued ASU 2016-01,*Recognition and Measurement of Financial Assets and Financial Liabilities*. ASU 2016-01 requires equity investments to be measured at fair value with changes in fair value recognized in net income; simplifies the impairment assessment of equity investments without readily determinable fair values by requiring a qualitative assessment to identify impairment; eliminates the requirement for public business entities to disclose the method(s) and significant assumptions used to estimate the fair value that is required to be disclosed for financial instruments measured at amortized cost on the balance sheet; requires public business entities to use the exit price notion when measuring the fair value of financial instruments for disclosure purposes; requires an entity to present separately in other comprehensive income the portion of the total change in the fair value of a liability resulting from a change in the instrument-specific credit risk when the entity has elected to measure the liability at fair value in accordance with the fair value option for financial instruments; requires separate presentation of financial assets and financial liabilities by measurement category and form of financial assets on the balance sheet or the accompanying notes to the financial statements and clarifies that an entity should evaluate the need for a valuation allowance on a deferred tax asset related to available-for-sale securities in combination with the entity's other deferred tax assets. ASU 2016-01 is effective for financial statements issued for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The adoption of this guidance is not expected to have a material impact on its consolidated financial statements.

RESULTS OF OPERATIONS

Year Ended December 31, 2015 and 2014

Revenues

To date, our revenues have been entirely comprised of grant awards. There were no grant awards or related revenues in 2015 and 2014. We will continue our efforts to secure future grant funding to subsidize ongoing research and developments costs.

Operating Expenses

Total operating expenses for the year ended December 31, 2015 increased 72% to $21.0 million compared to $12.2 million for the year ended December 31, 2014. Operating expenses are primarily comprised of research and development, clinical and regulatory and general and administrative expenses. For the year ended December 31, 2015, research and development expenses were $2.6 million, clinical and regulatory expenses were $14.1 million and general and administrative expenses were $4.4 million as compared to research and development expenses of $2.9 million, clinical and regulatory expenses of $5.3 million and general and administrative expenses of $4.0 million for the year ended December 31, 2014. For the year ended December 31, 2015, research and development expenses represented approximately 12% of operating expenses, clinical and regulatory expenses represented approximately 67% of operating expenses, and general and administrative expenses represented approximately 21% of operating expenses. For the year ended December 31, 2014, research and development expenses represented approximately 23% of operating expenses, clinical and regulatory expenses represented approximately 44% of operating expenses, and general and administrative expenses represented approximately 33% of operating expenses.

Research and development expense

Research and development expenses decreased by 9% to $2.6 million for the year ended December 31, 2015 compared to $2.9 million for the year ended December 31, 2014. The $0.3 million decrease was attributable to the following:

- a decrease of $1.1 million in pre-manufacturing costs associated with preparing to produce vaccines for use in our clinical trials (costs of vaccine production are now included in clinical and regulatory expense),
- decreases in patent, license and other professional fees of $0.2 million,
- decreases in consulting costs of $0.1 million as we bring more of the research and development function in-house

These decreases were offset by increased compensation costs of $0.8 million associated with salary increases, headcount additions, and increased non-cash stock-based compensation expense and increased lab supplies and other costs of $0.3 million.

Clinical and regulatory expense

Clinical and regulatory expense increased by 163% to $14.1 million for the year ended December 31, 2015 compared to $5.3 million for the year ended December 31, 2014. The $8.8 million increase was primarily attributable to the following increases:

- $5.0 million due to increased clinical trial activity related to the initiation of our Phase 1b HS-110 NSCLC clinical trial in September 2015 and continuation and increased enrollment in our Phase 2 HS-410 NMIBC clinical trial;
- $2.8 million in costs related to the production of clinical trial material as we advance our clinical trials;
- $0.8 million in personnel costs, primarily due to headcount additions to support our clinical trials and manufacturing efforts; and
- $0.2 million in travel and other costs.

General and administrative expense

General and administrative expense increased by 10% to $4.4 million for the year ended December 31, 2015 compared to $4.0 million for the year ended December 31, 2014. The $0.4 million increase was due to an increase of $0.4 million in professional fees, largely from recruitment fees associated with the search for a permanent CFO as well as an increase in investor relations fees.

Interest income

Interest income increased for the year ended December 31, 2015 as compared to the year ended December 31, 2014. The increase is due to higher interest rates from various short-term financial instruments that generated higher interest income for the year.

Other income (expense)

Other income was $0.2 million for the year ended December 31, 2015 as compared to a nominal expense for the year ended December 31, 2014. Other income is primarily related to the R&D Tax Incentive for expenses associated with clinical trial activities conducted in Australia. Other expense for the year ended December 31, 2014 is due to the stock warrant liability revaluation. We had no stock warrant liability after December 31, 2014 and therefore no related expense during 2015.

Interest expense

Interest expense for the year ended December 31, 2015 was $0.4 million compared to $0.1 million for the year ended December 31, 2014, all of which is attributable to the Square 1 Bank loans. The first installment, the Tranche 1 Loan, was drawn in August 2014, with the remaining draws occurring during 2015. As of December 31, 2015, we had drawn down all four Tranche Loans for a total of $7.5 million.

Net loss attributable to Heat Biologics, Inc.

We had a net loss attributable to Heat Biologics, Inc. of $20.3 million, or ($2.53) per basic and diluted share for the year ended December 31, 2015 compared to a net loss of $11.8 million, or ($1.83) per basic and diluted share for the year ended December 31, 2014.

BALANCE SHEET AS OF DECEMBER 31, 2015 AND 2014

Investments, held to maturity (net)

Investments held to maturity (net) decreased to $6.7 million as of December 31, 2015 compared to $10.7 million as of December 31, 2014. The decrease was primarily due to the investments converted to cash for use in our operating activities.

Prepaid Expenses

Prepaid expenses were slightly higher as of December 31, 2015 compared to December 31, 2014. Prepaid expenses consist of insurance, subscription software, and upfront payments to vendors.

Accounts Payable

Accounts payable was $2.0 million as of December 31, 2015 compared to $1.4 million as of December 31, 2014. This increase of $0.6 million was primarily related to increased clinical trial activity.

Accrued Expenses and Other Payables

Accrued expenses and other payables were $1.8 million as of December 31, 2015 compared to $0.8 million as of December 31, 2014. The increase of $1.0 million was primarily related to a $0.8 million increase due to increased clinical trial activity and a $0.2 million increase in accrued compensation due to expanded headcount.

LIQUIDITY AND CAPITAL RESOURCES

Sources of liquidity

To date, we have not generated any revenues. Since our inception in June 2008, we have financed our operations principally through private placements, our July 2013 initial public offering, our March 2015 public offering, and debt commitments (including our loan from Square 1 Bank described below). In connection with our July 2013 initial public offering, we sold 2,700,000 (including the 200,000 over-allotment option shares) shares of our common stock at a price of $10.00 per share. Aggregate gross proceeds from the IPO were $27.0 million and net proceeds received after underwriting commissions and offering expenses of $2.7 million were $24.3 million. As of December 31, 2015, we have used all net proceeds derived from the IPO in connection with our clinical trials, manufacturing and general and administrative expenses. In March 2015, we sold 1,640,000 shares of the Company's common stock, and 246,000 additional shares of the common stock to cover over-allotments at an offering price of $6.50 per share. The total gross proceeds from the March 2015 offering and subsequent over-allotment option was $12.3 million, before underwriting discounts, commissions and other offering expenses payable by us. The net proceeds to us were approximately $11.1 million. In August 2014, we entered into a secured loan with Square 1 Bank ("Loan"). The Loan provided us with a term loan in the aggregate principal amount not to exceed $7.5 million to be used to supplement working capital. The Loan was available to us in four tranches: $1.5 million was released to us August 2014 ("Tranche 1 Loan"), $1.5 million was released to us in December 2014, upon enrollment of the first patient in the Phase 2 clinical trial for HS-110 ("Tranche 2 Loan"), $2.25 million was released to us upon the initiation of the Phase 1b trial for lung cancer indication on June 30, 2015 ("Tranche 3 Loan") and $2.25 million was released to us upon evidence of the full enrollment of our Phase 1/2 clinical trial for HS-410 Square 1 Bank's on December 30, 2015 ("Tranche 4 Loan").

On February 29, 2016, we and certain of our subsidiaries entered into a Second Amendment (the "Second Amendment") with Pacific Western Bank (as successor in interest by merger to Square 1 Bank) to the Loan. The Second Amendment amended the financial covenants section of the Loan in order to memorialize certain previously agreed upon milestones, such that we are required to achieve the following milestone covenants: (i) on or before September 30, 2016, we shall have enrolled at least 18 patients in our DURGA (HS-110) clinical trial; (ii) on or before December 31, 2016, we shall have received favorable data readout from the Phase 2 randomized trial arms evaluating our HS-410 product; and (iii) after December 31, 2016, Pacific Western Bank and we shall set additional milestone covenants based upon a Board-approved plan sufficient to fund the operations necessary to achieve such milestones. In addition, the Second Amendment amended the Loan to provide that the delivery date of the annual budget for the 2016 fiscal year is extended to April 1, 2016.

We believe that our existing cash and cash equivalents will not be sufficient to meet our anticipated cash needs for the next twelve months, however, we believe that our existing cash and cash equivalents together with the proceeds from this offering, will be sufficient to fund the completion of our Phase 2 HS-410 NMIBC clinical trial and advancing our current Phase 1b trial evaluating HS-110 in combination with nivolumab, a Bristol-Myers Squibb PD-1 checkpoint inhibitor, for the treatment of NSCLC through the reporting of topline data. We intend to spend substantial amounts on research and development and clinical and regulatory activities, including product development, regulatory and compliance, clinical studies in support of our future product offerings, and the enhancement and protection of our intellectual property. We will need to obtain additional financing to pursue our business strategy, to respond to new competitive pressures or to take advantage of opportunities that may arise. These factors raise substantial doubt about our ability to continue as a going concern. As a result, our independent registered public accounting firm included an explanatory paragraph in its report on our consolidated financial statements as of and for the year ended December 31, 2015 with respect to this uncertainty. To meet our financing needs, we are considering multiple alternatives, including, but not limited to, additional equity financings, debt financings and/or funding from partnerships or collaborations. There can be no assurance that we will be able to complete any such transactions on acceptable terms or otherwise. If we are unable to obtain the necessary capital, we will need to pursue a plan to scale back our operations, license or sell our assets, seek to be acquired by another entity and/or cease operations. As of December 31, 2015, we had $11.6 million in cash and cash equivalents and short term investments.

We filed a shelf registration statement on Form S-3 where we may sell securities from time to time and in one or more offerings up to a total dollar amount of $50 million of securities. On October 23, 2014, the shelf registration statement was declared effective by the SEC. In October 2014, we entered into an ATM with Cantor Fitzgerald & Co. ("CF&Co"). On December 8, 2015, we delivered written notice to CF&Co that we were terminating our Controlled Equity Offering^{SM} Sales Agreement, dated October 10, 2014 (the "At-the-Market Offering Agreement"), pursuant to Section 12(b) thereof. No shares of the Company's common stock or any other securities were offered or sold pursuant to the At-the-Market Offering Agreement, and the offering program was terminated on December 8, 2015.

Cash flows

Operating activities. The use of cash in all periods resulted primarily from our net losses adjusted for non-cash charges and changes in the components of working capital. The significant increase in cash used in operating activities for the year ended December 31, 2015 compared to the year ended December 31, 2014 was due to an increase in clinical and regulatory expenses as we initiated and continued clinical trials. Additionally, there was an increase in other operational costs primarily associated with increases in headcount and/or consultants in all departments.

Investing activities. Cash provided by investing activities during the years ended December 31, 2015 and 2014 included the proceeds from maturities of various short-term investments offset by the purchases of these investments and purchases of property and equipment.

Financing activities. Cash provided by financing activities during the year ended December 31, 2015 was primarily from the March 2015 public offering and exercise of the over-allotment option which generated net proceeds of approximately $11.1 million (after deduction of offering expenses) as well as $4.5 million in proceeds from Tranche 3 and Tranche 4 of the Loan. Cash provided by financing activities for the year ended December 31, 2014 was approximately $3.0 million related to proceeds from the Loan and the exercise of stock options.

OFF-BALANCE SHEET ARRANGEMENTS

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

Current and Future Financing Needs

We have incurred an accumulated deficit of $44.4 million through December 31, 2015. We have incurred negative cash flows from operations since we started our business. We have spent, and expect to continue to spend, substantial amounts in connection with implementing our business strategy, including our planned product development efforts, our clinical trials, and our research and discovery efforts.

We believe that our existing cash and short-term investments will not be sufficient to fund our current operating plan and capital expenditure requirements for the next 12 months, however, we believe that our existing cash and cash equivalents together with the proceeds from this offering, will be sufficient to fund the completion of our Phase 2 HS-410 NMIBC clinical trial and advancing our current Phase 1b trial evaluating HS-110 in combination with nivolumab, a Bristol-Myers Squibb PD-1 checkpoint inhibitor, for the treatment of NSCLC through the reporting of topline data. We intend to meet our financing needs through multiple alternatives, including, but not limited to, additional equity financings, debt financings and/or funding from partnerships or collaborations.

However, the actual amount of funds we will need to operate is subject to many factors, some of which are beyond our control. These factors include the following:

- the progress of our research activities;
- the number and scope of our research programs;
- the progress of our preclinical and clinical development activities;
- the progress of the development efforts of parties with whom we have entered into research and development agreements;
- our ability to maintain current research and development licensing arrangements and to establish new research and development and licensing arrangements;
- our ability to achieve our milestones under licensing arrangements;
- the costs involved in prosecuting and enforcing patent claims and other intellectual property rights;
- the costs and timing of regulatory approvals; and
- profitability of our clinical laboratory diagnostic and microbiology services business.

We have based our estimate on assumptions that may prove to be wrong. We may need to obtain additional funds sooner or in greater amounts than we currently anticipate. Potential sources of financing include strategic relationships, public or private sales of our equity or debt and other sources. We may seek to access the public or private equity markets when conditions are favorable due to our long-term capital requirements. We do not have any committed sources of financing at this time, and it is uncertain whether additional funding will be available when we need it on terms that will be acceptable to us, or at all. If we raise funds by selling additional shares of common stock or other securities convertible into common stock, the ownership interest of our existing stockholders will be diluted. If we are not able to obtain financing when needed, we may be unable to carry out our business plan. As a result, we may have to significantly limit our operations and our business, financial condition and results of operations would be materially harmed.

License and Contractual Agreement Obligations

Below is a table of our contractual obligations for the years 2016 through 2020 as of December 31, 2015 (in thousands).

	2016	2017	2018	2019	2020	Total
License agreements	$ 38	$ 338	$ 38	$ 113	$ 288	$ 815
Payments on loans	3,226	3,226	490	—	—	6,942
Interest on loans	350	143	3	—	—	496
Lease agreements	231	238	245	194	—	908
Total	$ 3,845	3,945	776	307	288	$ 9,161

Additional In-Licensed Programs

We may enter into additional license agreements relating to new product candidates.

BUSINESS

Overview

We are an immuno-oncology company developing novel therapies intended to activate a patient's immune system to fight cancer. Using our T cell-stimulating platform technologies, *ImPACT*® (Immune Pan-Antigen Cytotoxic Therapy) and *ComPACT*™ (Combination Pan-Antigen Cytotoxic Therapy), we have generated several product candidates that we believe may be effective in treating certain forms of cancer. Our platform technologies address two synergistic mechanisms of action: activation of CD8+ T cells, or "killer" T cells; and T cell co-stimulation. We believe the use of these technologies has the potential to enhance patients' natural immune response against certain cancers.

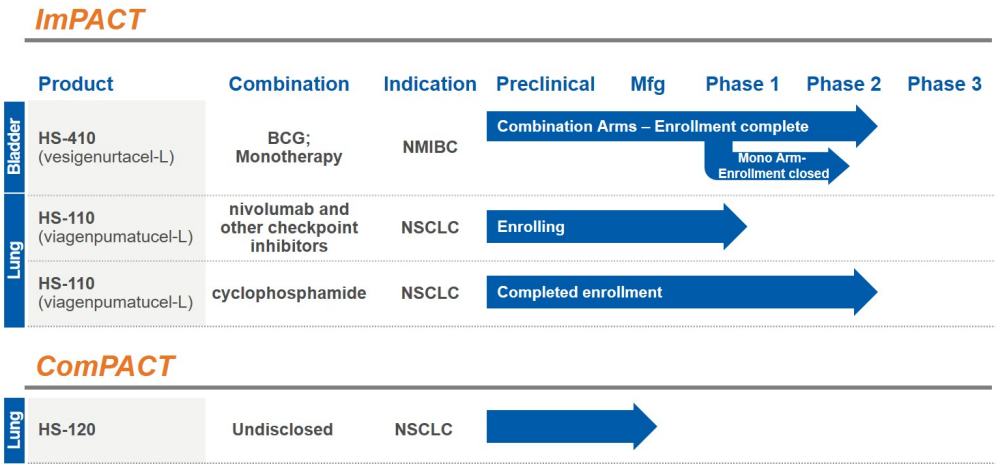
Using our *ImPACT*® platform technology, we have developed product candidates that consist of live, genetically-modified, irradiated human cancer cells which secrete a broad spectrum of tumor-associated antigens ("TAAs") together with a potent immune response stimulator called "gp96." The secreted antigen-gp96/TAA complexes activate a patient's immune system to recognize and kill cancer cells that express the TAAs included in the product candidates, which we have engineered to address the most prevalent TAAs present in the "tumor signature" of a specific cancer.

Our *ComPACT*™ platform technology enables us to combine a pan-antigen T cell activating vaccine and a T cell co-stimulator in a single product, offering the potential benefits of combination immunotherapy without the need for multiple independent biologic products. Using *ComPACT*™, we have engineered new product candidates that incorporate various ligand fusion proteins targeting co-stimulatory receptors (OX40, ICOS, 4-1BB) into the gp96-Ig expression vector, resulting in a single product candidate that includes both a pan-antigen T cell priming vaccine and a T cell co-stimulator.

Using our platform technologies, we produce product candidates from allogeneic cell lines selected to express the broadest array of commonly shared tumor antigens for a specified type of cancer. Unlike autologous or "personalized" therapeutic vaccine approaches that require the extraction of blood or tumor tissue from each patient and the creation of an individualized treatment, our product candidates are fully allogeneic, do not require extraction of individual patient's material or custom manufacturing. As a result, our product candidates can be mass-produced and readily available for immediate patient use. Because each patient receives the same treatment, we believe that our immunotherapy approach offers logistical, manufacturing and other cost benefits compared to one-off, patient-specific approaches.

Using our *ImPACT*™ platform technology, we have developed HS-410 (vesigenurtacel-L) as a product candidate to treat non-muscle invasive bladder cancer ("NMIBC") and HS-110 (viagenpumatucel-L), intended for use in combination with an anti-PD-1 checkpoint inhibitor, as a potential treatment for patients with non-small cell lung cancer ("NSCLC"). To-date, we have administered in excess of 1,000 doses of HS-410 and HS-110 collectively in approximately 200 patients. We are currently conducting a Phase 2 trial of HS-410 in patients with NMIBC and a Phase 1b trial of HS-110, in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. Using our *ComPACT*™ platform technology, we have developed HS-120 as a potential treatment for NSCLC. We expect to file an Investigational New Drug, or IND, submission for our first *ComPACT*™ product candidate for NSCLC (HS-120) in the second half of 2016.

The table below summarizes our current product candidates and their stages of development:



HS-410

We are currently conducting a Phase 2 trial evaluating HS-410 either alone or in combination with intravesical standard of care, Bacillus Calmette-Guérin (BCG), for the treatment of high-risk, NMIBC. The primary endpoint is one-year disease free survival. We completed enrollment for the Phase 2 trial's three randomized, combination arms and anticipates reporting topline efficacy, immune-response and safety data in the fourth quarter of 2016.

On February 25, 2016, we announced that we will no longer enroll new patients in our Phase 2 monotherapy trial arm evaluating HS-410 alone for the treatment of NMIBC. We added the monotherapy trial arm in response to the intermittent global shortage of standard of care BCG in early 2015. The shortage has since then been resolved and as such, we will no longer enroll new patients in this trial arm based on discussions with the U.S. FDA. The decision does not relate to concerns regarding the safety profile of HS-410. The 16 patients currently enrolled, out of the anticipated 25 patients, can continue receiving HS-410 monotherapy per the study protocol. We anticipate reporting topline 6-month data from these 16 patients in the fourth quarter of 2016, contemporaneous with reporting data from the company's three randomized Phase 2 trial arms evaluating HS-410 in combination with BCG.

On February 10, 2016, we announced that the U.S. FDA had lifted the partial clinical hold on our HS-410 Phase 2 clinical trial and that patient enrollment had resumed; clinical timelines were materially unchanged. On February 3, 2016, we announced that we had concluded that the cell line on which HS-410 is based, which is a prostate cancer cell line, had been previously misidentified as a bladder cancer cell line, that we had advised the U.S. FDA of this conclusion and that the U.S. FDA had placed our HS-410 Phase 2 clinical trial on partial clinical hold while they reviewed certain updated documentation provided by us related to the misidentification. The misidentification related to the origin of the cell line and not to the antigen profile or other characteristics of the cell line, which have been accurately characterized throughout the clinical development of HS-410. The partial clinical hold did not relate to concerns regarding the safety and efficacy of HS-410. All data generated and reported remained unchanged, including HS-410's positive safety profile, immune response and shared antigenic profile with patient tumors. Upon becoming aware of the misidentification, we amended all of the documentation necessary to correct the error, including the related investigator brochure, study protocol and informed consent form. Due to the short duration of the clinical hold, we do not expect any material change in our clinical timelines. In addition, we do not expect that the misidentification will have any adverse effect on the future clinical development of HS-410. While our rights to the prostate cancer cell line are non-exclusive, we believe that our intellectual property portfolio, which we expect to be unaffected by the misidentification, will provide us with appropriate protection for the development and potential commercialization of HS-410.

In January 2016, we reported three-month interim data from the unblinded, monotherapy cohort of the company's ongoing Phase 2 trial of HS-410 for the treatment of NMIBC at the Phacilitate Immunotherapy World Conference. In the monotherapy arm, a series of weekly intradermal injections of HS-410 is being dosed as an alternative to BCG. Images of the bladder taken from several treated patients showed changes that resemble lymphoid (T cell rich) structures that we have observed in biopsy samples, which we believe indicates that HS-410 is generating an immune response as expected. Six out of seven patients in the monotherapy arm, who had reached the 3-month timepoint after treatment with HS-410 alone, remained recurrence free. One of those patients had *carcinoma in situ* (*CIS*) – the patient population believed to be least responsive to BCG – and that patient experienced complete response.

In November 2015, we announced the results from our Phase 1 trial, evaluating the safety and immune response of HS-410, after surgery and treatment with BCG in patients with high-risk NMIBC. In that trial, HS-410 exhibited a positive safety profile and was well-tolerated with no serious adverse events (SAEs) and no patients discontinuing the trial due to adverse events (AEs). 7 out of the 10 patients had no documented recurrence of cancer >1 year after treatment. 3 out of 4 patients with *CIS* did not experience a recurrence one year after treatment. In the study subjects, HS-410 elicited a broad-based (polyclonal) expansion of patient T cells and a high level of CD8+ tumor-infiltrating lymphocytes (TILs). Additionally, based on tissue samples taken from each patient, HS-410 shared 15 or more tumor antigens in common with those expressed on the patients' cancer cells, which we believe supports our belief that HS-410 has the ability to target a broad range of tumor antigens. These data confirm previous preclinical findings regarding the unique mechanism of action for HS-410. Moreover, third-party analysis of blinded samples from the trial demonstrated a strong correlation between baseline characteristics of TILs by T cell receptor (TCR) sequencing and clinical outcome. Specifically, the 7 patients who remained disease free after one year exhibited the greatest clonal expansion of intratumoral T cells (p-value 0.0126).

In October 2015, we completed enrollment of our 75-patient, blinded, randomized, placebo-controlled arms of our ongoing Phase 2 clinical trial evaluating HS-410 in combination with BCG in patients with high risk NMIBC. Our Phase 2 trial will examine safety, tolerability, immune response and preliminary clinical activity of HS-410. The primary endpoint is one-year disease free survival. We expect to report topline efficacy, immune-response and safety results in the fourth quarter of 2016.

In March 2015, the U.S. Food and Drug Administration ("FDA") granted Fast Track designation for HS-410 for the treatment of NMIBC. The Fast Track program is designed to facilitate the development and expedite the review of therapies intended to treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs. The advantages of Fast Track designation include actions to expedite development, including opportunities for frequent interactions with the FDA review team to discuss all aspects of developments to support approval and eligibility for priority review depending on clinical data at the time of Biologics License Application ("BLA") submission. We believe that this designation will expedite our development of HS-410.

HS-110

We are conducting a Phase 1b clinical trial evaluating HS-110 in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. The multicenter, open label trial is expected to initially enroll 18 patients and is designed to accommodate cohort expansion up to 30 patients in total. The purpose of the trial is to evaluate the safety and efficacy of HS-110 in combination with nivolumab, an FDA approved anti-PD-1 checkpoint inhibitor, in patients with NSCLC whose cancers have progressed after first-line therapy. Primary and secondary trial endpoints include safety and tolerability, immune response, overall response rate and progression-free survival. Top-line objective response rate and 6-month progression free survival (PFS) data are expected by the end of 2016 for these first 18 patients.

We also are conducting a Phase 2 clinical trial evaluating HS-110 in combination with low dose cyclophosphamide versus chemotherapy alone as a potential third-line or fourth-line treatment in patients with NSCLC. We completed enrollment of 66 patients in this study in September 2015. These patients will be followed for immune response and overall survival with data expected to be reported in the fourth quarter of 2016.

The inventor of the *ImPACT*® technology that we license reported results in February 2013 from a Phase 1 open-label, single center clinical trial of HS-110 in patients with advanced NSCLC. We believe the results provide clinical evidence that HS-110 is capable of generating anti-cancer immune responses. In the study, 18 patients were vaccinated, and 15 of the 18 vaccinated patients completed the first course of three planned courses of therapy. Two patients completed all three planned courses of therapy (defined as three, six week treatment cycles). HS-110 showed no overt toxicity. There were no serious adverse events (SAEs) that were considered by the trial investigator to be treatment-related. Most of the adverse events (AEs) were reported as mild or moderate (grade 1 or 2) with the most frequent being injection site reactions and rash that were transitory and usually resolved in one to two weeks. We believe that the results of this Phase 1 trial with HS-110 demonstrate that HS-110 is capable of generating a CD8-CTL IFN- γ immune response in patients with advanced NSCLC. Eleven of the fifteen patients (73%) who completed the first course of therapy with HS-110, exhibited a two-fold or greater increase in CD8+ cells secreting interferon gamma (CD8-CTL IFN- γ). The estimated median survival of these eleven patients was 16.5 months (95% CI:7.1-20.0). In comparison, the 4 patients who failed to show increased CD8-CTL IFN-γ responses survived 2.1, 2.3, 6.7, and 6.7 months, or a median survival of 4.5 months, which is consistent with the expected survival times in this patient population. In 7 of 18 treated patients, tumor growth was stabilized, however no partial or complete tumor responses (e.g., reduction or disappearance of tumors) were observed in any of the 18 patients. The median one-year overall survival rate of patients in the study was 44% (95% CI:21.6-65.1), comparing favorably to a 5.5% rate based on published data from a 43-patient advanced lung cancer population. One of the late-stage lung cancer patients survived over four years since starting therapy and another patient survived over three years since starting therapy. These findings were consistent with multiple preclinical published studies on *ImPACT*® therapy.

Additional Indications

We continue to evaluate other potential indications for our*ImPACT*® and *ComPACT*™ platform technologies. Specifically, using *ComPACT*™, we have developed cell lines for several other cancers with the first product candidate being a second-generation therapy for NSCLC (HS-120). Our decision to further pursue these product candidates or any additional product candidates other than our two lead product candidates will be based in part upon available funding and partnering opportunities. On February 18, 2015, we announced a collaboration with OncoSec Medical Inc. to evaluate the feasibility of OncoSec's ImmunoPulse *in vivo* electroporation technology for intratumoral delivery of gp96-Ig encoding DNA plasmids to activate specific immune responses against 'private,' mutation-derived tumor neo-antigens. This collaboration is ongoing, and we expect to announce data demonstrating that intratumoral electroporation of *ComPACT*™ plasmid DNA leads to release of tumor specific neo antigens in the first half of 2016.

***ComPACT*™**

On June 15, 2015, we announced the development of a next-generation platform incorporating various T cell costimulatory ligand fusion proteins into the gp96-Ig expression vector. *ComPACT*™ combines a pan-antigen T cell priming vaccine and T cell co-stimulator in a single product, offering the potential benefits of combination immunotherapy in a single drug without the need for multiple independent biologic products. *ComPACT*™ has been engineered to incorporate various fusion proteins targeting co-stimulatory receptors (OX40, ICOS, 4-1BB), enabling the combination of two important immunotherapy pathways in a single drug. We have reported preclinical data demonstrating that *ComPACT* secreting OX40L generated the most potent immune response among other *ComPACT* co-stimulator variations including TL1A, 4-1BBL and ICOSL, as well as compared to systemic delivery of OX40 agonist antibody and vaccine alone. For our *ComPACT*™ platform technology, we expect to file an IND for our first*ComPACT*™ candidate for NSCLC (HS-120) in the second half of 2016.

***ImPACT*® Therapy**

Our *ImPACT*® therapy is a novel technology platform designed to educate and stimulate the immune system to combat specific disease targets, such as cancer cells.*ImPACT*® utilizes live attenuated, human-derived, genetically-modified cells to generate an array of tumor associated antigens and secrete an essential immunostimulatory protein called "gp96-Ig". The secreted proteins are designed to generate an immune response against cancer cells by mobilizing and activating a patient's own killer T cells to target a broad array of different tumor antigens with the goal of eliminating cancer cells. In contrast with other vaccine technologies that target only one antigen, *ImPACT*®*'s* pan-antigen approach may enable the body to induce and maintain an immune response against a broad array of tumor-specific proteins, by potentially providing a more robust and sustained immune response and limiting cancer cells' ability to evade the immune system. We believe the clinical and preclinical results suggest that *ImPACT*® generates anti-tumor immune responses capable of targeting and destroying tumors. We believe our novel, off-the-shelf, live cell therapy has the potential to be used to combat a wide range of cancers. We have leveraged our existing infrastructure by developing additional product candidates in areas where we can use our proprietary technology. Our success will depend on the clinical and regulatory success of our product candidates and our ability to retain, on commercially reasonable terms, financial and managerial resources, which are currently limited. To date, we have not received regulatory approval for any of our product candidates or derived any revenues from their sales. Moreover, there can be no assurance that we will ever receive regulatory approval for any of our product candidates or derive any revenues from their sales.

***ImPACT*®/*ComPACT*™ Platform Technologies Advantages:**

- *ImPACT*® therapy represents a cell-based product platform that functions as both an immune activator and an antigen-delivery vehicle.
- In addition, to our knowledge, *ImPACT*® is the only adjuvant currently in clinical development that is specific to CD8+ cytotoxic T cell immune responses, which we believe is especially important for developing therapeutics in oncology.
- *Our therapies do not require an additional adjuvan*. Some vaccines require the addition of another drug, called an adjuvant, to enhance their effectiveness. Adjuvants typically cause irritation at the injection site. HS-110, one of our product candidates, is itself an adjuvant, so we do not have to use additional adjuvants to generate and maintain an activated immune response, thereby limiting any injection site reaction to that caused by our own therapies.
- *ComPACT*™ represents a potential dual-acting immunotherapy, combining a pan-antigen T cell priming vaccine and T cell co-stimulator in a single product.
- To our knowledge, *ComPACT*™ represents the first dual-acting immunotherapy that provides more effective stimulation of CD8+T cells and higher rates of tumor rejection than are achieved with either individual administration of traditional vaccines, OX40 agonist antibodies, or combinations with OX40 agonist antibodies and traditional vaccines.

The CD8+ cytotoxic T cell specific nature of our*ImPACT*® and *ComPACT*™ platform technologies predict that they will be most useful in stimulating immune responses for diseases where actual cell-killing is an important part of the therapeutic effect. Cancer, which is a disease of mutated cells, naturally became the first area of focus. *ImPACT*® and *ComPACT*™ applied to cancer therapies contrast in several critical ways to other cancer immunotherapy technologies:

- Both *ImPACT*® and *ComPACT*™ platform technologies offer our ready-to-use approach which do not require any personalized manufacturing. We believe our therapeutic vaccines *are easier and less expensive to manufacture than autologous vaccines* because our therapeutic vaccines do not require the harvesting of blood and/or tumor tissue from each patient in order to manufacture a course of treatment. We believe this is highly advantageous because it can bring the logistics, manufacturing, cost and distribution of our therapeutic vaccines within the purview of traditional biopharmaceutical product channels and dramatically expand our pool of corporate partners.

- Both *ImPACT*® and *ComPACT*™ platform technologies stimulate an immune response against the full antigenic repertoire of the cancer cells, not just one or a handful of antigens. Our *ImPACT*® and *ComPACT*™ platform technologies are designed to combine broad antigen targeting of known and unknown tumor associated antigens complexed with a potent immune adjuvant. The activated immune response generated by our platform technologies may be useful in treating a wide range of cancers.
- There are no other allogeneic, cell-based vaccine technologies which provide a molecular transporter (gp96-Ig in the case of *ImPACT*® and *ComPACT*™) to provide specific activation of a patients CD8+ T cells across MHC barriers.

Strategy

Our objective is to become a leading biopharmaceutical company specializing in the development and commercialization of allogeneic, ready-to-use immunotherapies. Our platform technologies, *ImPACT*® and *ComPACT*™, are designed to address two synergistic mechanisms of action: robust activation of killer T cells and T cell co-stimulation to further enhance patients' immune response. We believe future cancer immunotherapy will involve multiple agents and our platform could work synergistically with other therapies, such as checkpoint inhibitors, which are designed to reverse tumor-induced immune suppression. We are focused on discovering, developing and applying our *ImPACT*® and *ComPACT*™ platform technologies towards a number of disease indications. The key elements of our strategy are:

- *Develop and obtain regulatory approval for our product candidates.* We have completed enrollment for the randomized arms of our NMIBC Phase 2 trial evaluating HS-410 in combination with BCG and are no longer enrolling new patients in the monotherapy arm of our NMIBC Phase 2 trial evaluating HS-410. We expect to report topline efficacy, immune response and safety results in the fourth quarter of 2016. We are conducting a Phase 1b trial of HS-110 in combination with nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with NSCLC. Beyond NSCLC and bladder cancer - depending upon funding and partnering opportunities - we plan to initiate additional clinical trials and in some cases may expand current clinical trials in these and other disease targets utilizing our *ImPACT*® and *ComPACT*™ platform technologies.
- *Maximize commercial opportunity for our ImPACT® and ComPACT™ technology*. Our current product candidates target large markets with significant unmet medical needs. For each of our product candidates, we seek to retain all manufacturing, marketing and distribution rights which should give us the ability to maximize the economic potential of any future United States or international commercialization efforts. We believe that we should be well positioned to successfully commercialize our product candidates independently or through United States and international corporate partnerships.
- *Enhance our partnering efforts.* We are continually exploring partnerships for licensing and other collaborative relationships and remain opportunistic in seeking strategic partnerships.
- *Further expand our broad patent portfolio.* We have made a significant investment in the development of our patent portfolio to protect our technologies and programs, and we intend to continue to do so. We have obtained exclusive rights to six different patent families directed to therapeutic compositions and methods related to our vaccine platform and preclinical development programs for cancer and have filed certain additional patent applications that are owned by us. Our *ImPACT*®*/ComPACT*™ patent portfolio comprises eighteen issued patents and thirty-one pending patent applications. These patents and applications cover the United States, Europe, and Japan as well as several other countries having commercially significant markets.
- *Manage our business with efficiency and discipline.* We believe we have efficiently utilized our capital and human resources to develop and acquire our product candidates and programs, and create a broad intellectual property portfolio. We operate cross-functionally and are led by an experienced management team with backgrounds in developing and commercializing product candidates. We use project management techniques to assist us in making disciplined strategic program decisions and to attempt to limit the risk profile of our product pipeline.

- *Obtain additional grant funding.* To more fully develop our *ImPACT®* and *ComPACT™* platform technologies and their application to a variety of human diseases, we plan to continue to seek and access external sources of grant funding on our own behalf and in conjunction with our academic and other partners to support the development of our pipeline programs. While we intend to work with our academic partners to secure additional grant funding, these partners have no obligation to work with us to secure such funding. We also intend to continue to evaluate opportunities and, as appropriate, acquire or license technologies that meet our business objectives.
- *Continue to both leverage and fortify our intellectual property portfolio.* We believe that we have a strong intellectual property position relating to the development and commercialization of our *ImPACT®* and *ComPACT™* platform technologies. We plan to continue to leverage our portfolio to create value. In addition to fortifying our existing intellectual property position, we intend to file new patent applications, in-license new intellectual property and take other steps to strengthen, leverage, and expand our intellectual property position.

Disease Targets and Markets

The Oncology Market

The American Cancer Society estimates that 1.69 million people in the United States will be diagnosed with cancer in 2016. The lifetime probability of being diagnosed with an invasive cancer is 43% for men and 38% for women. It is projected that 595,690 Americans will die from cancer in 2016.

Despite continuous advances made in the field of cancer research every year, there remains a significant unmet medical need as the overall five-year survival rate for cancer patients diagnosed between 2004 and 2010 is an average of 68%. According to the Centers of Disease Control and Prevention, in 2011, cancer was the second leading cause of mortality in the United States (22.9%) behind heart disease (23.7%). The American Cancer Society estimates that one in four deaths in the United States is due to cancer.

The main treatments for cancer are surgery, radiotherapy and chemotherapy. There are often, however, significant debilitating effects resulting from these treatments or lingering morbidity associated with these approaches to treatment of cancer. Our goal is to develop new treatments that can lengthen survival times and improve the quality of life of cancer patients and survivors.

Although there are a large number of patients, treatment and management of cancer is performed by a relatively concentrated pool of medical professionals. We plan to reach this prescriber base using a relatively small commercial infrastructure that we intend to develop in the future by either hiring internally, or partnering or contracting with one or more third-party entities with an established sales force. These development plans are dependent on our raising additional capital and/or receiving grant funding, the success of HS-110, and HS-410 and any technologies we might develop in the future and successful negotiation of commercial relationships, none of which we have completed to date. We believe, however, assuming the efficacy and safety of HS-110 and HS-410 and any other technology we might acquire, that our experienced management team will raise the capital and establish the commercial relationships necessary for success.

Limitations of Current Cancer Therapies

We believe current cancer treatment alternatives suffer from a number of limitations that impair their effectiveness in improving patient survival and overall quality of life including:

- *Toxicity.* Chemotherapeutic agents are highly toxic to the human body and very often cause a variety of significant and debilitating side effects, including, but not limited to, nausea and vomiting, bleeding, anemia and mucositis. Some targeted therapeutics have fewer systemic toxicities, but still typically have off-target effects such as gastrointestinal inflammation, severe skin reactions and breathing difficulties. These side effects limit a patient's ability to tolerate treatment and as such can deprive the patient of the potential benefit of additional treatments or treatment combinations that might otherwise destroy or prevent the growth of cancer cells. Once they become aware of the limited efficacy, limited increased survival and potentially significant toxicity of existing treatment alternatives, many patients diagnosed with terminal cancer choose to limit or forego therapy in order to avoid further compromising their quality of life. Patients with advanced stage cancer also often cannot tolerate cancer therapy, and certain therapies can hasten death as the patient's health further deteriorates from the therapy applied.

- *Mechanism of action.* While many current therapeutic approaches can be effective against specific targeted cells, the efficacy of these therapies in treating cancer over the long term generally is limited by the abundance and diversity of the cancer and tumor cells, which are believed to enable the targeted cells to adapt and become resistant to the current therapeutic approach over time.

- *Short-term approach.* Other than tumor removal in a surgical procedure, curing the cancer is often not the intent or a potential outcome of many current cancer therapies. Rather, increased survival time is the primary focus of many currently marketed and development-stage cancer therapeutics. In this regard, many cancer therapies show only a modest impact on the overall survival of the patients and only affect the length of time that passes after treatment begins and before the patient's disease worsens or the patient dies.

- *Immune system suppression.* A weakened immune system not only inhibits the body's natural ability to fight cancer, but also causes patients to become more susceptible to infections and other diseases. Current approaches to cancer treatment generally involve introduction of an agent, such as a chemical, an antibody or radiation, which causes cell apoptosis (programmed cell death) or inhibits the proliferation of all cells, including immune cells, which has the unintended consequence of indirectly suppressing the immune system.

Immunotherapy Overview

Our *ImPACT* ™ and *ComPACT*™ platform technologies are forms of immunotherapy. Immunotherapy involves administration of a therapeutic agent that enlists or boosts a subject's immune system in order to fight disease.

Commonly recognized successful examples of immunotherapy include*prophylactic vaccines*, such as, childhood immunizations against infectious diseases such as measles, mumps, and rubella. In these cases, usually weakened (attenuated) or inactivated viruses are injected into the body to educate certain immune system cells to recognize and remember small pieces of viral or bacterial proteins (antigens). If and when an individual is subsequently exposed to this same pathogen, the immune system will recognize these antigens immediately and mount a potent immune response to neutralize and eliminate the pathogenic threat.

Therapeutic vaccines, such as *ImPACT*® and *ComPACT*™-based product candidates, operate in a fashion similar to *prophylactic vaccines* except that *therapeutic vaccines* are administered after a particular disease is already present. In each case, the human immune system is educated and harnessed to recognize and fight the disease of interest. Cancer can be considered a failure of the immune system to effectively recognize and eliminate inappropriately dividing and multiplying (malignant) cells. Under ordinary circumstances the human immune system continuously monitors and eliminates inappropriately dividing cells. However, for reasons that are not entirely understood, under cancerous conditions the immune system fails to recognize malignant cells and such cells are permitted to inappropriately multiply, grow and metastasize to form tumors which can eventually become life threatening. Our therapeutic vaccines are designed to assist the immune system in identifying and eliminating malignant cells. Our approach involves activating strong T cell immune responses against cellular antigens that are characteristic of malignant cells with the goal of destroying the cancer expressing those antigens.

Immunotherapy Approaches

Immunotherapy is designed to stimulate and enhance the body's natural mechanism for killing cancer cells and virus-infected cells. Generally, immunotherapeutic approaches to treat disease can be separated into two distinct classes, passive and active, based on their mechanism of action.

Passive Immunotherapy: Passive immunotherapies generally consist of monoclonal antibodies directed at a single disease-specific enzyme or protein on the surface of the targeted cells with the goal of either killing the targeted cells or preventing them from dividing. Rather than stimulate or otherwise use the body's immune system to initiate the attack on the disease, the attack is made by the therapy which is produced *ex vivo*, or outside of the body. These therapies also are not usually personalized for the patient.

Active Immunotherapy: Active immunotherapies generally consist of therapies intended to trigger or stimulate the body's own immune system to fight disease. Active immunotherapies have no direct therapeutic action but rather contain antigens specifically designed to activate the patient's own immune system to find and kill the targeted cells that carry the same antigen. Active immunotherapies depend on the patient's immune system to seek out and destroy targeted cells or tumors. Most active immunotherapies utilize off-the-shelf antigens, known as "defined" antigens, rather than individualized, patient specific antigens, and are often paired with adjuvants, which are agents that generally activate the immune system cells to increase immune response.

Shortcomings of Immunotherapies: Both passive and active immunotherapy approaches have shortcomings, which include:

- Most active immunotherapies use normal, non-mutated, self-antigens which are typically poor at stimulating immune responses, even from healthy immune systems. In fact, the human immune system generally does not generate immune responses against self-antigens. Most passive and active immunotherapies also target one or only a few antigens, which increases the probability that infected cells will escape detection by the immune system and immunotherapy.

- Many active immunotherapies employ a single defined antigen so they are not effective against cancers which do not express that antigen.

- Most immunotherapies produce toxic effects resulting in damage to healthy tissues.

- Many patients may not be able to mount effective immune responses with immunotherapy due to tumor or virus induced immunosuppression of accessory cells such as CD4+ helper T cells, which are necessary for the immunotherapies to be effective but may be functionally impaired by the patient's disease.

- It can be difficult to commercialize immunotherapies based on cells derived from individual patients in a cost-effective manner as a result of the added complexity, limited patient material for production of multiple doses, and the need to store and ship the individual doses.

- Immunotherapies that rely on defined, off-the-shelf antigens or a single targeted antigen may have limited effectiveness because even within the same type of cancer, the genetic makeup and distinct antigens of a tumor can vary significantly from patient to patient.

Although many of the immunotherapies currently in clinical development have shown promising results, we believe that specific proprietary elements of the *ImPACT*® and *ComPACT*™ platform technologies combined with a well-honed clinical strategy position Heat favorably in the marketplace

Our Solution: ImPACT®/ComPACT™ Therapy

We believe our *ImPACT*® and *ComPACT*™ therapies have a number of advantages over existing therapies. These advantages, elaborated below, may enable us to develop commercial products that extend the survival of, and improve the quality of life for, cancer patients:

- They are designed to fight cancer by activating the immune system against a wide variety of cancer antigens (both known and unknown). This has now been confirmed in patients with non-muscle invasive bladder cancer treated with HS-410.
- They are intended to continually secrete a wide variety of cancer-associated antigens, thus initiating a broad and sustained pan-antigen cytotoxic T cell attack against the targeted cancer. We believe this broad-based attack increases the probability of destroying the targeted cancer.
- They are designed to stimulate a natural immune response against specific cancer cells. We believe this may limit serious adverse events related to treatment.
- We believe that the novel mechanism of action, good tolerability and favorable safety profile will enable our *ImPACT*® and Com*PACT* product candidates to have potential benefits across multiple disease stages and tumor types and in combination with other therapies.
- Our *ImPACT*® therapy represents an agent that functions as both an immune activator and an antigen-delivery vehicle. To our knowledge, *ImPACT*® is the only allogeneic cell-based technology platform currently in clinical development that is specific to CD8+ cytotoxic T cell immune response, which is especially important for developing therapeutics in oncology.
- Our *ComPACT*™ platform was developed using in-house expertise and is a platform that can provide a vaccine and a T cell costimulatory molecule in a single therapeutic. In preclinical studies, the *ComPACT*™ platform incorporating OX40 stimulation provided superior immune response and tumor rejection to what is seen with either OX40 agonist antibodies alone or in combination with traditional vaccines.
- Our *ImPACT*® and *ComPACT*™ platforms are off-the-shelf therapies and offer substantial manufacturing and cost advantages compared to autologous or "personalized" immunotherapies.
- We believe many patients for whom the risks associated with chemotherapy, BCG or other traditional agents are intolerable may be able to benefit from our *ImPACT*® and *ComPACT*™ product candidates.

ImPACT® TECHNOLOGY PLATFORM

ImPACT® Background

Our *ImPACT*® technology represents an "off-the-shelf" method to deliver cancer antigens complexed to heat shock proteins, or HSPs, to illicit an immune response. HSPs are used as a signaling mechanism by the immune system to identify mutated proteins ("antigens"), including those from tumor cells. Although always present within certain cells, HSPs are normally only released when cells die by necrosis or unnatural cell death (rather than apoptosis or natural programmed cell death) and upon release are recognized by the host's immune system. When a cell dies an unnatural death through "necrosis", such as when it is infected and killed by a flu virus or other pathogen, the cell releases its contents into circulation setting off a molecular warning to the immune system thereby generating a rapid and potent immune response. Because HSPs very rarely leave cells, the immune system has evolved to recognize HSPs that have been released from dying cells as the sentries of a molecular alarm system. This characterizes the role of heat shock proteins as damage associated molecular patterns (DAMPS). Upon detection of HSPs, the immune system then directs an immune response against any foreign (pathogenic) proteins bound to the HSP at the time the cell that released it died.

HSPs have several functions including:

- Protecting tissues from pathogens by activating the immune system.
- Acting as a chaperone to:
  - Facilitate proper protein folding within the endoplasmic reticulum.
  - Enable proper function of toll-like receptors and the innate immune system.
  - Carry damaged proteins to intracellular garbage disposals to be degraded into peptides (short chains of amino acids– that are protein fragments).
- Loading peptides onto another class of proteins known as MHC I molecules. MHC I molecules move to the cellular surface where they are monitored by the immune system.
- Directing antigen cross-presentation for activation of CD8+ T cells toward tumor antigens

HSP gp96 is one of the most abundantly expressed proteins in the human body and is expressed by all cells. It is normally retained within cells in a compartment called the endoplasmic reticulum (ER), where it facilitates the folding of newly synthesized proteins so that they may perform their various tasks properly. Gp96 is particularly important in the process of detecting antigens as it is present in all cell types and, it is able to recognize all antigens. It also induces the immune system to activate CD8+ ("killer") T cells which then seek out and destroy the cells that are marked by antigens. Gp96 is normally only contained inside the ER of cells, however when a cell dies an abnormal death through necrosis it breaks open and releases gp96 into the surrounding tissue microenvironment. *ImPACT*® works by modifying the chemical structure of gp96 so that a cell can continuously secrete it into the extracellular space accompanied by the unique peptide that it is folding at the time without causing necrosis. This allows the immune system to seek out and destroy cells characterized with antigens before the body would otherwise have detected them.

***ImPACT*® Technology Overview**

A limitation of utilizing gp96 as a cancer immunotherapy is that it is normally retained within cells by a small region called a "KDEL sequence" that acts like a "leash", preventing gp96 from leaving the ER. Therefore, in order to utilize gp96 as a therapeutic, gp96 must either be purified from individual cells or engineered to be secreted from cells.

To overcome this limitation, a team of scientists led by Eckhard Podack, M.D., Ph.D., the Former Chairman of our Scientific Advisory Board and the inventor of this technology, deleted this KDEL sequence and replaced it with another sequence that causes the new fusion protein, called gp96-Ig, to be secreted from cells continuously. Multiple tumor cell lines were then made to express gp96-Ig, and as expected, secreted it continuously into the extracellular space in a complex with tumor antigens. Dr. Podack demonstrated that gp96-Ig vaccination effectively cross-presented tumor specific antigens to immune cells, led to expansion of Cytotoxic T Lymphocytes (CTL) and the subsequent rejection of injected tumor cells. Importantly, these studies demonstrated that the secreted protein gp96-Ig maintained the critical characteristics of the native gp96 protein required to generate anti-tumor immune responses.

Our ImPACT® technology platform:

- ***Effectively cross-presents tumor antigens and leads to cytotoxic killer T cell activation***

  Published studies in mice showed that killer T cell activation was approximately 20 million times greater with *ImPACT*® secreted gp96-Ig than with a corresponding gp96 protein injection. The modified cell secretes gp96 in a sustained release for several days after injection. This creates a sustained immune response. These data suggest that gp96-chaperoned peptides may represent the most efficient, robust pathway for presenting a cell's antigens to the immune system and activating killer T cells.

- ***Binds and presents all potential tumor antigens to the immune system simultaneously***

  A single type of tumor might have multiple strains derived from numerous tumor cells. These different strains have different antigens, all of which are capable of initiating an immune response. By creating a vaccine from a tumor-cell line, we believe that *ImPACT®'s* technology can develop a therapy that shares many common features with patients' tumors. We believe this "blanket" approach will provide each patient with a higher likelihood of a positive response to the therapy.

- ***Features killer T cell activation that is independent of CD4+ T cell help***

  Animal studies have confirmed that our technology initiates a mechanism called cross-presentation that is critical to inducing tumor rejection. Importantly, it does this independently and successfully without additional CD4+ T cell (also known as a helper T cell) recruitment, which is typically required in a normal immune system response. This is particularly important in cancer and HIV because helper T cell activity is frequently impaired in these disease states.

- ***May cause few side effects***

  We believe our technology allows the body to recognize cancer as a foreign entity and uses the body's natural immune mechanism to recognize and fight it. In doing so, we believe our product candidates will generate fewer side effects than conventional chemotherapy and that patients will be able to maintain a higher quality of life.

The distinguishing characteristics of *ImPACT®* are:

(i) While most other immunotherapy approaches target only a single antigen, our patented approach uses modified heat shock proteins to stimulate an immune response against multiple antigens contained within cancer cells (both known and unknown). Cancer cells express different antigens that can be used to initiate an immune response. Each *ImPACT®* vaccine is created from a tumor-cell line that we believe expresses a wide array of those antigens most commonly expressed in a particular type of cancer. For our lung cancer trials, the cell line that was used and expressed the most favorable antigen profile for lung cancer was a lung cancer cell line and for our bladder cancer trials the cell line that was used and expressed the most favorable antigen profile for bladder cancer was a prostate cancer cell line. We believe this "pan-antigen" approach provides each patient with a higher likelihood of a response to the therapy.

(ii) Our product candidates are made from "off-the-shelf" (allogeneic) cells and may therefore be less expensive to manufacture than patient-specific (autologous) vaccines. Our vaccines are mass-produced from a single source while other immunotherapy approaches require physicians to extract a patient's blood and/or cells, send them to a facility where a personalized vaccine is created, and then have them shipped back to the physician for injection into the patient.

(iii) While competing companies are developing therapies that are both "off-the-shelf" and which target multiple antigens, our*ImPACT®* technology is the only "off-the-shelf" (allogeneic) vaccine – to know our knowledge - that directly induces "cross-presentation" to the CD8+ ("killer") T cells, which are the cytotoxic arm of the immune system. Stimulating these CD8 (killer) T cells through "cross-presentation" has recently been shown to be critical to the induction of effective anti-tumor immunity. We believe our product candidates are able to leverage gp96 to serve as their own powerful immune stimulant (adjuvant) while other companies' technologies rely on the use of a secondary adjuvant like GMCSF or Alum.

Our ComPACT™ Technology Platform

The *ComPACT*™ technology platform was created in-house to take advantage of all aspects of the T cell activation platform and to build upon them. Because the future of cancer immunotherapy appears to be focused on drug combinations, it is valuable to conceive technologies where one drug may be re-purposed to do two things, rather than always relying on individual combinations of different single-function drugs. The need for this sort of innovation is highlighted by the recent approval of Nivolumab and Yervoy for patients with late stage melanoma. The price for this combination is upwards of $250,000 per course of therapy, not including the substantially increased ancillary costs associated with monitoring and treating the potentially fatal complications that are common with such a combination. *ComPACT*™ was designed to deliver the gp96-Ig vaccine molecule together with a T cell costimulatory fusion protein in a single compound. The first iterations of *ComPACT*™ included OX40L-Fc, 4-1BBL-Fc and ICOSL-Fc as the T cell costimulatory proteins, and due to preferential activity with the OX40L-Fc version of *ComPACT*™, this compound has been prioritized for rapid clinical development. Interestingly, the activity of locally secreted OX40L-Fc from *ComPACT*™ provides a superior immune response and tumor rejection than what is seen with OX40 agonist antibodies and vaccine alone. Furthermore, *ComPACT* secreting OX40L generated the most potent immune response in preclinical models among other *ComPACT* co-stimulator variations including TL1A, 4-1BBL and ICOSL.

Our Product Candidates and Clinical Development Programs

We have initiated development programs to target our *ImPACT*® technology platform against a range of diseases, including non-muscle invasive bladder cancer (NMIBC) and non-small cell lung cancer ("NSCLC"). In October 2015, we completed full enrollment of 75 patients in the blinded, randomized, placebo-controlled arms of our ongoing Phase 2 clinical trial evaluating HS-410 either in combination with BCG, or HS-410 alone, in patients with high risk, NMIBC. In early 2015, we added a monotherapy arm to the trial in response to an intermittent global shortage of standard of care BCG. We enrolled an additional 16 patients out of an anticipated 25 patients to evaluate HS-410 as a monotherapy in an unblinded, open-label arm of the same trial. The BCG shortage has since been resolved and we are no longer are enrolling patients in this arm based on discussions with the FDA. The 16 patients currently enrolled can continue to receive HS-410 monotherapy as per the study protocol. We began dosing NSCLC patients in combination with nivolumab in a Phase 1b protocol with our first therapeutic vaccine, HS-110, in the second half of 2015. The inventor of our technology platform had also completed a study in primates for the development of a therapeutic and prophylactic vaccine for the treatment and prevention of HIV. This study was fully funded by the NIH. The HIV trials were initiated by the primary inventor and to date have been funded by grants awarded to the primary inventor, which can be used at the discretion of the inventor. We have no funding obligation for such trials and the primary inventor is responsible for future development and research; nonetheless any research conducted by the primary inventor contributes to our body of research and we may choose to progress with any such research to further clinical trials and incorporate such research into our future development plans.

***ImPACT*™ INDICATIONS**

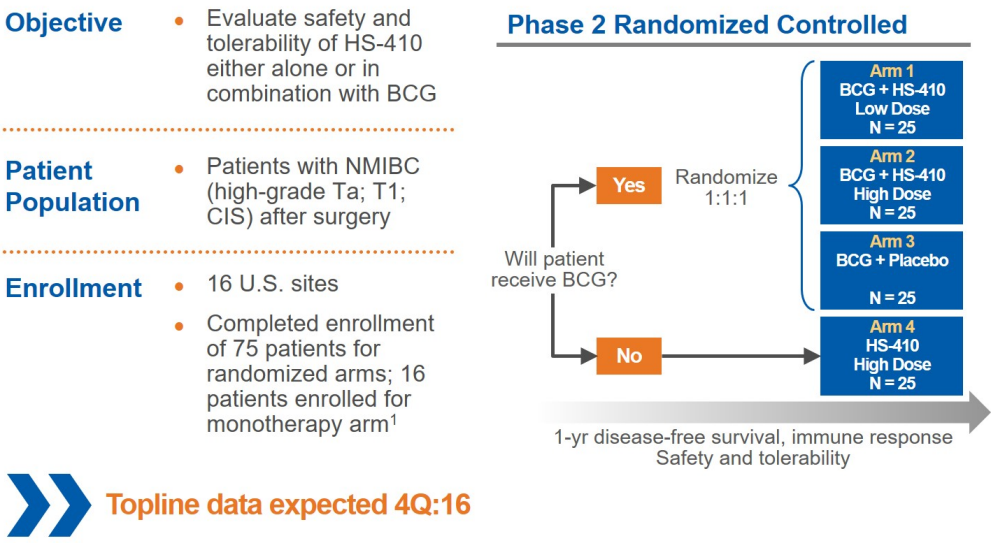
Bladder Cancer

Disease

In the United States, bladder cancer is the fourth most common type of cancer in men and the eleventh most common cancer in women. According to the National Cancer Institute, 1 in 42 men and women will be diagnosed with bladder cancer during their lifetimes, meaning more than half a million people are living with bladder cancer in the United States. In 2015, the American Cancer Society estimated 74,000 cases of bladder cancer will be diagnosed in the United States, and an estimated 16,000 deaths will occur. According to the American Cancer Society there are currently over 500,000 bladder cancer patients in the United States and thirty percent (30%) of the patients have muscle invasive bladder cancer (MIBC) and seventy percent (70%) of the patients have NMIBC. Available treatments are currently not effective, in all patients, thus this remains an area of high unmet need. According to Park JC, et al. *Clin Adv Hematol Oncol.* 2014 Dec;12(12):838-45, lifetime treatment costs for bladder cancer are approximately $96,000 to $187,000 per individual per year in U.S.

Phase 2 Clinical Development

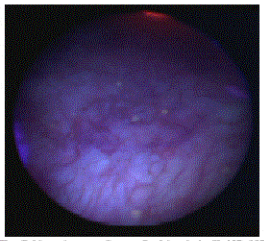
Enrollment is complete for the 75 patients in the blinded, randomized, placebo-controlled arms of our Phase 2 clinical trial to examine safety, tolerability, immune response and preliminary clinical activity of HS-410 in patients with high risk, superficial bladder cancer who have completed surgical resection. In early 2015, we added a monotherapy arm to the trial in response to an intermittent global shortage of standard of care BCG. The BCG shortage has since been resolved and we are no longer enrolling patients in this arm based on discussions with the FDA. The 16 patients currently enrolled, out of the anticipated 25 patients, can continue to receive HS-410 monotherapy as per the study protocol. We enrolled the additional 16 patients to evaluate HS-410 as a monotherapy in an unblinded, open-label arm. The Phase 1 portion started treatment with HS-410 after standard intravesical bacillus Calmette-Guérin (BCG) immunotherapy; the Phase 2 portion investigates one of two doses of HS-410 or placebo in combination with BCG or one dose of HS-410 as monotherapy. We anticipate including approximately 15-20 clinical sites in the United States with an enrollment period of 18-24 months.



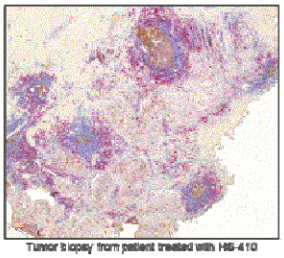
1. As announced on February 25, 2016, no new patients will be enrolled in the monotherapy trial arm following resolution of the BCG shortage and recent discussions with FDA.

In January 2016, we reported three-month interim data from the unblinded, monotherapy cohort of the company's ongoing Phase 2 trial of HS-410 for the treatment of NMIBC at the Phacilitate Immunotherapy World Conference. In the monotherapy arm, a series of weekly intradermal injections of HS-410 is being dosed as an alternative to BCG. Images of the bladder taken from several treated patients showed changes that resemble lymphoid (T cell rich) structures that we have observed in biopsy samples, which we believe indicates that HS-410 is generating an immune response as expected.

HS-410 Ph 2 NMIBC
Monotherapy 3-Month Interim Data



Blue-light cystoscopy from patient treated with HS-410



Tumor biopsy from patient treated with HS-410

- Images of the bladder (above) showed changes that resemble lymphoid (T cell rich) structures, indicating that HS-410 leads to a localized immune response within the urinary bladder

Source: Healio HS-410 Phase 2 NMIBC interim monotherapy trial results announced January 26, 2018

HS-410 Ph 2 NMIBC
Monotherapy 3-Month Interim Data

3-mo recurrence rate (RR) – combo arms still blinded

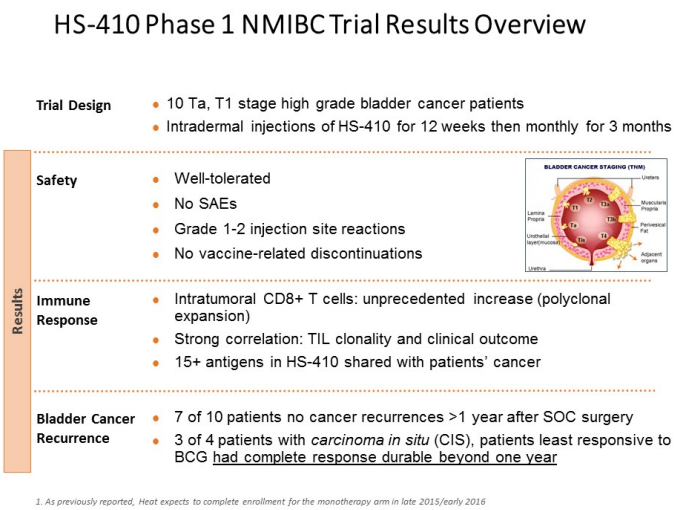
Population	Historical RR[1]	Monotherapy RR
High-risk papillary only	~20%	1/6 (17%)
CIS	**~50%**	**0/1 (0%)**
Intermediate risk	UNK (~<20%)	N/A
Composite	~30%	1/7 (14%)

- No recurrences to date beyond six months in either the Ph 1 or Ph 2 monotherapy trials
- Six different investigators performing cystoscopies have commented:
  - *"The bladders look different…bumpy…nodular…"*

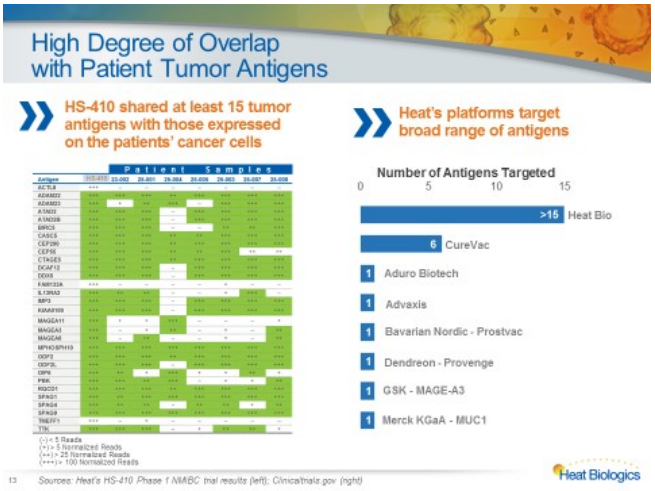
19 Source: 1) SWOG 8507 (Lamm 2000 J Urol), EORTC 30906 (de Reijke 2005 J. Urol), EORTC 30962 (Oddens 2013 Eur Urol)

Heat Biologics

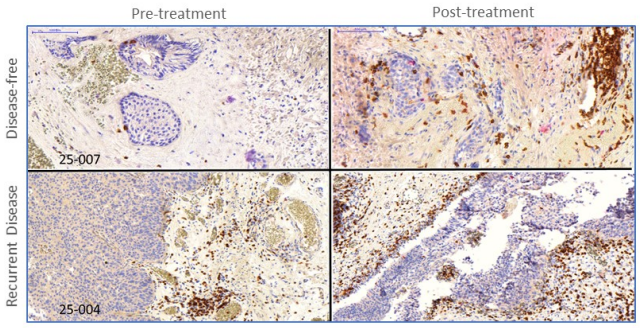
On November 6, 2015, we announced positive results from our Phase 1 trial, evaluating the safety and immune response of HS-410, after standard of care bacillus Calmette-Guérin (BCG), for the treatment of high-risk NMIBC. These results are outlined below:



HS-410 exhibited a positive safety profile and was well-tolerated with no patients discontinuing the trial due to adverse events (AEs). Furthermore, no serious adverse events (SAEs) were reported, and 7 out of 10 patients had no documented recurrence of cancer >1 year after standard of care surgery. Significantly, 3 out of 4 patients with *carcinoma in situ* (CIS), the patient population least responsive to standard of care, did not recur. HS-410 elicited a broad-based (polyclonal) expansion of patient T cells and a high level of CD8+ tumor-infiltrating lymphocytes (TILs). Additionally, based on tissue samples taken from each patient, HS-410 shared 15 or more tumor antigens in common with those expressed on the patients' cancer cells, which we believe indicates HS-410's ability to target a broad range of tumor antigens for all patients treated to date. These data confirm previous clinical findings regarding the unique mechanism of action for HS-410 and for our *ImPACT*® and *ComPACT*™ platform technologies. Moreover, third-party analysis of blinded samples demonstrated a strong correlation between baseline characteristics of TILs by T cell receptor (TCR) sequencing and clinical outcome. Specifically, the 7 patients who remain disease free exhibited the greatest clonal expansion of intratumoral T cells (p-value 0.0126).

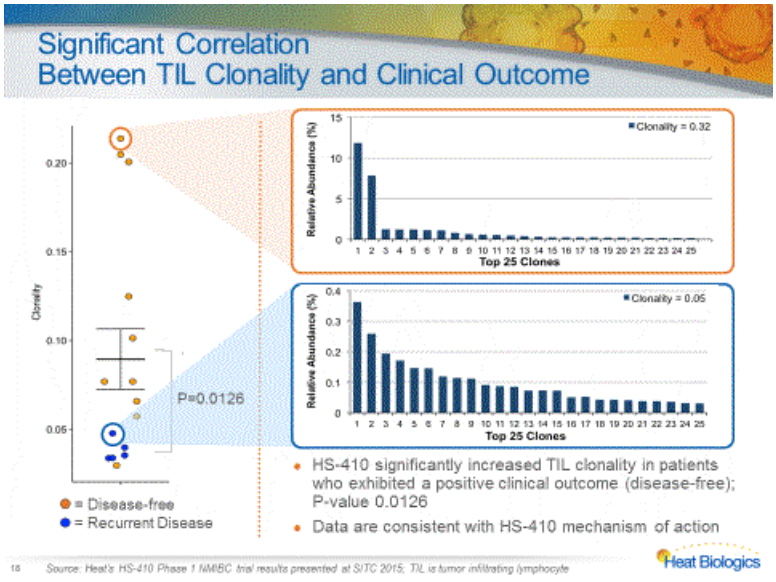


Post-treatment Induction of CD8+ TIL

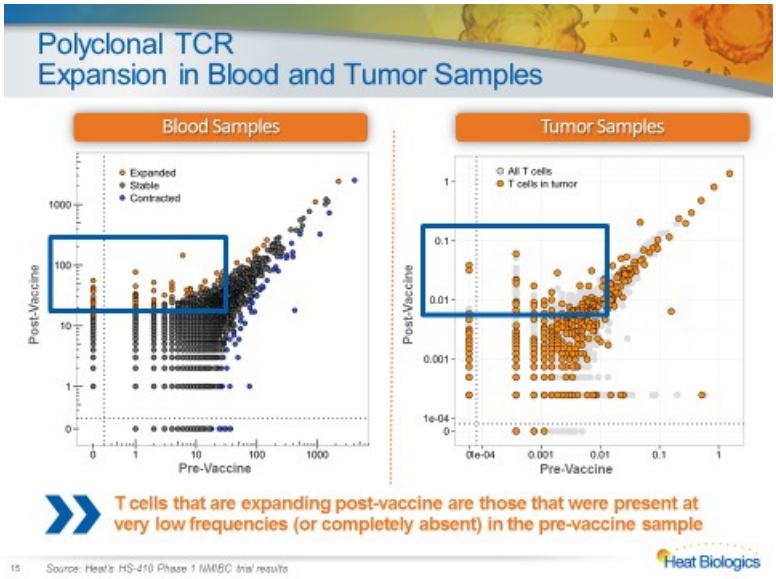


- Before treatment there are few CD8+ (red) TIL in the disease-free patient (25-007, upper left), whereas TIL are abundant in the recurring patient (25-004, lower left)
- Following treatment with HS-410, there is robust induction of TIL in the disease-free patient, with moderate induction in the recurring patient

Source: Heat's HS-410 Phase 1 NMIBC trial results presented at SITC 2015



Source: Heat's HS-410 Phase 1 NMIBC trial results presented at SITC 2015; TIL is tumor infiltrating lymphocyte



In October 2015, we completed full enrollment of 75 patients in the blinded, randomized, placebo-controlled arms of our ongoing Phase 2 clinical trial evaluating HS-410 either in combination with BCG, or HS-410 alone, in patients with high risk, NMIBC. The Phase 2 trial will examine safety, tolerability, immune response and preliminary clinical activity of HS-410. The primary endpoint is one-year disease free survival. We expect to report topline efficacy, immune-response and safety results in the fourth quarter of 2016.

On March 5, 2015, we were notified that the U.S. Food and Drug Administration ("FDA") granted Fast Track designation for HS-410 for the treatment of NMIBC. The Fast Track program is designed to facilitate the development and expedite the review of therapies intended to treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs. The advantages of Fast Track designation include actions to expedite development, including opportunities for frequent interactions with the FDA review team to discuss all aspects of developments to support approval and eligibility for priority review depending on clinical data at the time of Biologics License Application ("BLA") submission. We believe that this designation will expedite our development of HS-410.

Other Cancers

We continue to evaluate other indications for our *ImPACT*™ and *ComPACT*™ platform technologies. Specifically, using *ComPACT*™, we have developed cell lines for several other cancers with the first product candidate being a second-generation therapy for non-small cell lung cancer (HS-120). Our decision to further pursue these or any additional product candidates other than our two lead product candidates will be based in part upon available funding and partnering opportunities.

Lung Cancer

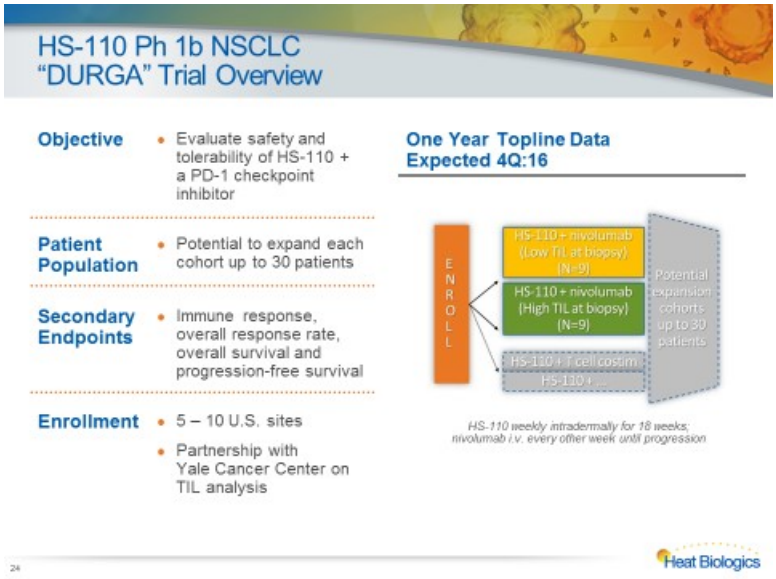
Disease

Lung cancer is the leading cause of cancer-related death in the United States. According to the National Cancer Institute, in 2015, lung cancer was expected to account for 26% of all female cancer deaths and 28% of all male cancer deaths. An expected 221,200 people were diagnosed with lung cancer in the United States in 2015. Of these lung cancers, roughly 85% were expected to present as non-small cell lung cancer. Patients with advanced clinical stage IIIB/IV disease have a 5-year survival rate as low as 1-5%.

Phase 1b Clinical Trial

In May 2015, we initiated our Phase 1b clinical trial investigating the combination of our HS-110 therapeutic vaccine and nivolumab (Opdivo®), a Bristol-Myers Squibb PD-1 checkpoint inhibitor, to treat patients with non-small cell lung cancer (NSCLC). HS-110 is our first product candidate in a series of proprietary *ImPACT*® based immunotherapies designed to stimulate patient's own T cells to attack cancer. HS-110 is a biologic product comprising a lung cancer cell line that has been genetically modified using our *ImPACT*® technology platform to secrete a wide range of lung cancer associated antigens bound to gp96 proteins and activate a T cell mediated pan-antigen immune response against the patient's cancer. This multicenter trial is evaluating the safety and efficacy of HS-110 in combination with nivolumab in patients with NSCLC whose cancers have progressed after first-line therapy. Primary and secondary trial endpoints include safety and tolerability, immune response, overall response rate and progression-free survival. This trial is expected to initially enroll 18 patients, and we expect to release top-line objective response rate and 6-month progression free survival (PFS) data on these first 18 patients by the end of 2016.

Phase 1b HS-110/DURGA Trial Design



Phase 2 Clinical Development

Data from our Phase 2 randomized, controlled trial using HS-110 in combination with cyclophosphamide versus chemotherapy alone in third-line and fourth-line NSCLC patients is expected during the fourth quarter of 2016. This trial which enrolled 65 patients is winding down to instead focus on combinations with checkpoint. The trial was structured as a multicenter randomized, study to evaluate the immune response, safety and efficacy endpoints of HS-110 when administered weekly for 12 weeks in combination with low-dose cyclophosphamide in an induction period followed by monotherapy HS-110 every nine weeks during maintenance for up to one year. Patients randomized to the comparator arm were treated with one chemotherapy regimen until progression. Blood samples were taken to evaluate the immune response and their correlation to overall survival, and where considered appropriate by the investigator, patients are invited to consent for pre- and post-treatment biopsies for exploratory biomarker analysis. The primary endpoint was overall survival; secondary endpoints follow objective responses and immune response.

Phase 1 HS-110 Clinical Trial

Background

A Phase 1 clinical trial with HS-110 in patients with very late stage IIIB/IV NSCLC was undertaken by the inventor of the technology which we license at the Sylvester Comprehensive Cancer Center with a total of 18 patients dosed, 15 of which completed the first course of three planned courses of therapy and were evaluated. Two of these 15 patients completed all three planned courses. The primary purpose of this trial was to evaluate safety of HS-110, while the secondary objectives were to study gp96-Ig specific immune responses and to monitor clinical progress. The patients were divided into 3 arms. Due to statistical and safety considerations and early termination of the study, the patients in the trial were not evenly divided among the three arms. Arm 1, which consisted of 11 patients, received 40 million cells every two weeks for 18 weeks, arm 2, which consisted of 4 patients, received 20 million cells every week for 18 weeks and arm 3, which consisted of 3 patients, received 10 million cells twice a week for 18 weeks. Three of the patients, who were late stage lung cancer patients, died before their immune response could be evaluated and were not included in the evaluation set at the end of the trial.

The Phase 1 trial was conducted under an investigator-sponsored IND and was fully funded by the NIH. The main criteria for inclusion were: (i) patients with histologically confirmed NSCLC stage IIIB, stage IV, or recurrent disease; (ii) at least one site of bi-dimensionally measurable disease; (iii) treated brain metastasis must be stable by CT scan or MRI for at least 8 weeks; (iv) patient must have received and failed at least two lines of therapy (one of them erlotinib); (v) age ≥ 18 years; ECOG performance status 0-2; life expectancy ≥ 3 months; and (vi) signed informed consent.

The median age was 67 years (range 38-86). HS-110 showed no overt toxicity. There were no serious adverse events (SAEs) that were considered by the trial investigator to be treatment-related. Most of the adverse events (AEs) were reported as mild or moderate (grade 1 or 2) with the most frequent being skin induration and rash that were transitory and usually resolved in 1 to 2 weeks.

We believe that the results of the Phase 1 trial with HS-110 demonstrate that HS-110 is capable of generating a CD8-CTL IFN-γ immune response in patients with advanced NSCLC. In 11 of the 15 patients (73%) that completed the first course of therapy with HS-110, there was a twofold or greater increase in CD8 cells secreting interferon gamma (CD8-CTL IFN- γ). These patients also exhibited an estimated median survival of 16.5 months (95% CI:7.1-20.0). In contrast, 4 patients were immune non-responders and survived 2.1, 2.3, 6.7, and 6.7 months, or a median survival of 4.5 months, which is consistent with the expected survival times in this patient population. The protocol required that we look for such responses, but, as is typical in immunotherapy, no partial or complete tumor responses were observed. The median one-year overall survival rate of patients in the study was 44% (95% CI:21.6-65.1). For comparative purposes, while there was a wide range of survival times, the one-year overall survival rate in a published one-year, 43-patient, advanced lung cancer population was 5.5%. One of the late-stage lung cancer patients survived over four years since starting the therapy and another patient survived over three years since starting the therapy. These findings were consistent with multiple preclinical published studies on *ImPACT*® therapy.

HS-110 Safety

We believe HS-110 showed no overt toxicity. There were no serious adverse events (SAEs) that were considered by the trial investigator to be treatment-related. Most of the adverse events (AEs) were reported as mild or moderate (grade 1 or 2) with the most frequent being skin induration and rash that were transitory and usually resolved in 1 to 2 weeks. The single grade 3 AE was in the “Body as a Whole” category (fatigue) and was rated as “possibly” related. There were no immune-related events with the vaccine or the vaccinations.

Skin reactions at the vaccination site were minimal and of short duration and there was no evidence of the generation of any autoimmune phenomena. In lieu of a dose escalation design, the design of the Phase I trial involved increasing the frequency of vaccination, while still retaining the total dose of vaccine cells administered. A more frequent vaccination schedule caused increased tumor rejection in preclinical models.

Adverse Events by Body System

Body System	Number of Events (N=219)	Severity Grade (# of events)
Injection Site Reactions	166 (75.8%)	Grade 1 (166)
Respiratory System	9 (4.1%)	Grade 2(5)
Body as a Whole (general disorders including fever)	8(3.7%)	Grade 1(4) Grade 2(3) [a] Grade 3(1) [b]
Nervous System	8(3.7%)	Grade 2(1)
Musculoskeletal	7(3.2%)	Grade 2(5)
Digestive System	7(3.2%)	Grade 1(7)
Metabolic and Nutrition	6(2.7%)	Grade 1(6)
Skin and Appendages (non-injection site reactions)	4(1.8%)	Grade 2(1)
Cardiovascular System	2(0.9%)	Grade 2(1)
Urogenital System	1(0.5%)	Grade 1(1)
Endocrine System	1(0.5%)	Grade 2(1)
Hemic and Lymphatic	—	—

a All grade 2 AEs except 4 were classified as non-related to treatment. The grade 2 treatment-related AEs were 1 musculoskeletal event (joint pain) rated as definitely related. 1 musculoskeletal event (knee weakness) rated as possibly related. 1 endocrine event (hot flashes) rated as unlikely related and 1 skin event (pruritus) rated as unlikely related.

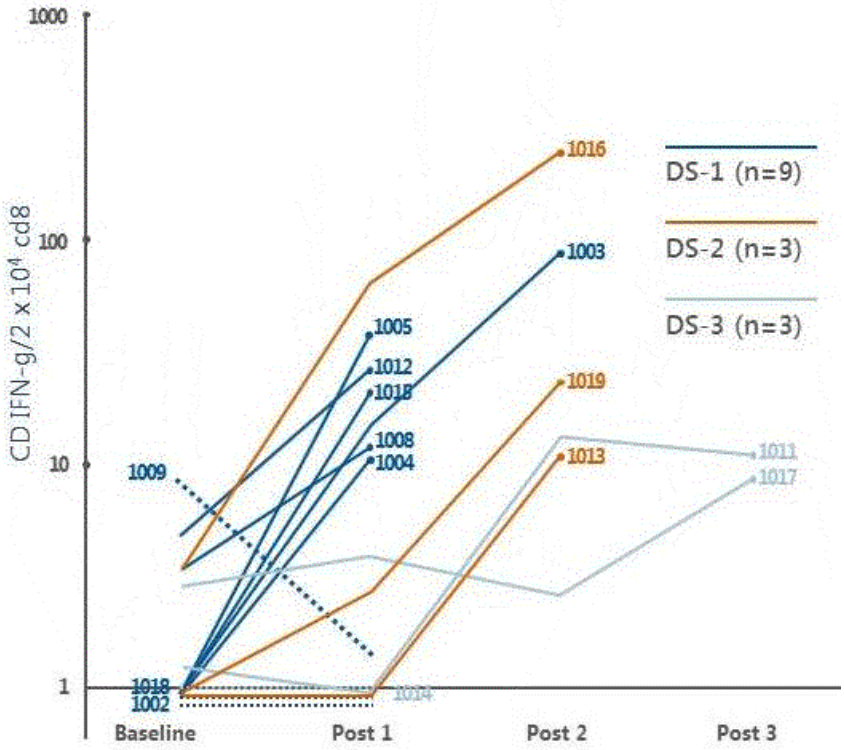
b The single grade 3 AE was in the body as a whole category (fatigue) and was rated as possibly related.

Injection Site Reactions

Injection Site Reaction (ISR)	Number of Events (N = 166)
Pain	17 (10%)
Induration	58 (35%)
Pruritus	8 (5%)
Hyperpigmentation/Discoloration	3 (2%)
Rash	78 (47%)
ISR non-specific	2 (1%)

Positive Immunological Response

In 11 of the 15 patients (73%) completing the first course of therapy with HS-110, there was a twofold or greater increase in CD8 cells secreting interferon gamma (CD8-CTL IFN- γ) following vaccination.



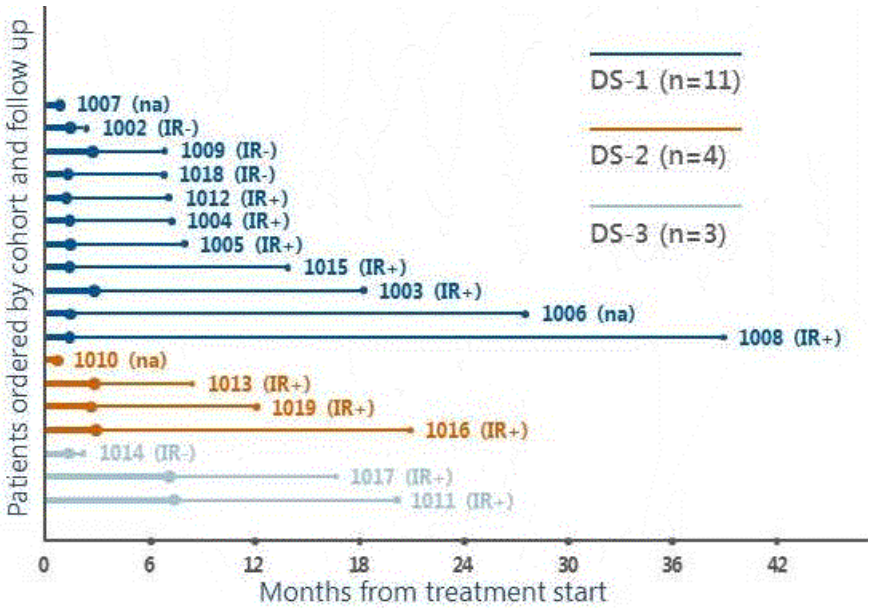
CD8 IFN- γ response. Samples from 15 patients collected for immune response at baseline and after at least one course of vaccination were available for analysis of the CD8 IFN- γ response. 20,000 purified patient CD8 T cells were stimulated with vaccine cells for 40h in ELI-spot plates and the frequency of IFN- γ secreting cells determined. + indicates first increase. Solid lines indicate immune response (IR+), dashed lines no response (IR −).

Since NSCLC is known to be highly immunosuppressive, we believe that by overcoming tumor-induced-suppression with frequent vaccinations as observed anecdotally in the Phase 1 study and the generation of an observed potent polyepitope specific CD8 CTL is encouraging and warrants further study.

Clinical Response

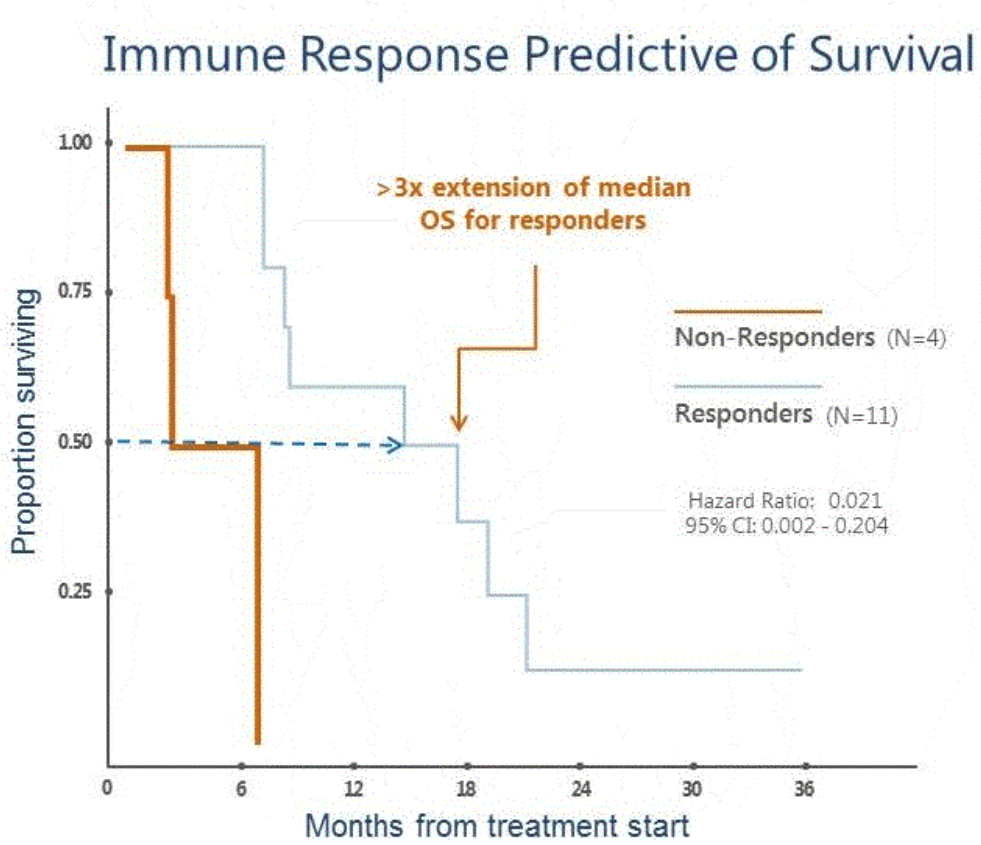
Seven of 15 patients completing the first course of therapy (39%; 95% CI: 17.3- 64.3%) achieved disease stabilization after the first course of vaccinations (6 weeks) and 8 patients had disease progression. While the protocol required that we look for such responses, as is typical in immunotherapy, no partial or complete tumor responses were noted in the study. Although clinicians and patients may perceive disease stabilization as beneficial, without a control arm the FDA does not consider it to be a clinical benefit for regulatory purposes. In order to obtain FDA approval, we will be required to show an improvement in progression-free survival (or, PFS) or overall survival (or, OS) when compared to a control arm in a randomized study. The Kaplan Meier estimate of median time to progression was 1.4 months (95% CI: 1.3-2.7), and the PFS rates at 1, 2 and 3 months were 88.9% (95% CI: 62.4- 97.1%), 38.9% (95% CI: 17.5-60.0%), and 11.1% (95% CI: 1.9-29.8%), respectively. Of note, two patients remained progression free for just over 7 months.

The typical median survival period for late-stage lung cancer is 4.5 months for patients who are not receiving any treatment. Two of the fifteen patients who completed the first course of therapy were followed for over 3 years and 4 years, respectively. The Kaplan-Meier estimate of median overall survival was 8.1 months (95% CI: 6.7- 18.2), and the 1, 2, and 3-year OS rates were 44.4% (95% CI: 21.6-65.1%), 19.0% (95% CI: 4.8- 40.3%), and 9.5% (95% CI: 0.8-32.1%), respectively. While these results may be encouraging, apparent differences in outcome between population-based survival estimates and treatment groups from a clinical study can arise from differences other than drug treatment. The reliability of such comparisons must also be considered in light of the unblinded nature of the study data at the time that the comparator was chosen. Moreover, the wide range of values in the 95% confidence intervals in our study suggests that the actual median survival times could lie anywhere in the reported intervals.



Time to progression (thick line) and additional follow up (thin line) by dose-schedule cohort. Patients are shown within cohort in order of increasing follow up (shortest at top). Filled diamonds indicate disease progression; open diamonds indicate stable disease at last assessment. Filled circles indicate death; open circles last follow up of surviving patients. IR+: more than twofold increase in CD8 from baseline. IR − : no CD8 immune response. na: not assessed for immune response.

In 11 of the 15 patients (73%) completing the first course of therapy with HS-110, there was a twofold or greater increase in CD8 cells secreting interferon gamma (CD8-CTL IFN-y) following vaccination. In a non-prespecified analysis, the responders saw a threefold increase in median overall survival compared to the non-responders on the trial.



Summary

In summary, based on the results of this Phase 1 trial in 18 patients, we believe HS-110 showed no overt toxicity and appears to be capable of generating CD8-CTL IFN-γ immune responses in patients with advanced NSCLC. These results are encouraging and may be predictive of clinical benefit based on stabilization of disease, overall survival and the immune responder results.

Manufacturing

We rely on third-party manufacturers to produce and store our product candidates for clinical use and currently do not own or operate manufacturing facilities.

We have retained Lonza Walkersville, Inc. a vendor, which has begun manufacturing of HS-110 to be used in our Phase 2 and potential Phase 3 clinical trials. We entered into an eight year Manufacturing Services Agreement, dated October 20, 2011, with the vendor (the "Manufacturing Agreement"). The Manufacturing Agreement provides that the vendor will manufacture products based on our *ImPACT*® technology intended for use in pharmaceutical or medicinal end products, including, without limitation, products in a final packaged form and labeled for use in clinical trials or for commercial sale to end users in accordance with the terms and conditions of individual statements of work. The Manufacturing Agreement requires that we purchase a certain minimum percentage of our annual global product requirements from the vendor. The Manufacturing Agreement may be terminated by the parties upon mutual agreement, and by each party for a material breach by the other party that is not cured within the cure period, upon notice that a clinical trial for which product is being produced under the agreement is suspended or terminated or upon the other party's insolvency, dissolution or liquidation.

The HS-110 used in the inventor's Phase 1, and in our Phase 2 clinical trial and HS-410 used in our Phase 1/2clinical trial was and is currently manufactured under current good manufacturing practices, or cGMP. The vaccine is grown in large quantities, dispensed into individual doses, frozen in liquid nitrogen, and quality tested in compliance with FDA guidelines. The vaccine is irradiated, which is a commonly used attenuation process that eliminates the ability of the gp96-Ig-containing vaccine cell lines to replicate but allows them to continue secreting gp96-Ig for a period of several days. These batches of frozen, irradiated vaccine are stable for long periods of time, and are thawed immediately prior to administration to patients. Sufficient material to dose a subset of patients in the HS-110 Phase 2 study has already been produced, and preparations are underway to produce quantities required for trial completion and subsequent clinical trials. Sufficient material to complete the Phase 1 portion and part of the Phase 2 portion of the HS-410 Phase1/ 2 study has already been produced, and preparations are underway to produce quantities required for trial completion and subsequent clinical trials.

Competition

The pharmaceutical industry and biologics industry are each highly competitive and characterized by a number of established, large companies, mid-sized companies, as well as smaller companies like ours. If our competitors market products that are less expensive, safer or more effective than any future products developed from our product candidates, or that reach the market before our approved product candidates, we may not achieve commercial success. Technological developments in our field of research and development occur at a rapid rate and we expect competition to intensify as advances in this field are made. We will be required to continue to devote substantial resources and efforts to our research and development activities. As a biotechnology company with cancer immunotherapy agents as s lead product candidates, we compete with a broad range of companies. At the highest level, cancer immunotherapy can be seen as both a complement and a potential competitor to any oncology therapy, most notably chemotherapy, biologics and small molecule drugs. Not only do we compete with companies engaged in various cancer treatments including radiology and chemotherapy but we also compete with various companies that have developed or are trying to develop immunology vaccines for the treatment of cancer. Certain of our competitors have substantially greater capital resources, large customer bases, broader product lines, sales forces, greater marketing and management resources, larger research and development staffs and larger facilities than we do and have more established reputations as well as global distribution channels. Our most significant competitors, among others, are fully integrated pharmaceutical companies such as Eli Lilly and Company, Bristol-Myers Squibb Company, Merck & Co., Inc., Novartis AG, MedImmune, LLC (a wholly owned subsidiary of AstraZeneca plc), Johnson & Johnson, Pfizer Inc., MerckKGaA and Sanofi-Aventis U.S. LLC, and more established biotechnology companies such as Genentech, Inc. (a member of the Roche Group), Amgen Inc., Celgene Corporation, Gilead Sciences, Inc., and competing cancer immunotherapy companies such as Kite Pharma, Inc., Juno Therapeutics, Inc., Bluebird Bio, Inc., Transgene SA, Valeant Pharmaceuticals International, Inc., NewLink Genetics Corporation, Agenus Inc., NovaRx Corporation, Aduro Biotech, Inc., Advaxis, Inc., ImmunoCellular Therapeutics, Ltd., Immunovaccine Inc., Oncothyreon Inc., Oxford BioMedica plc, Bavarian Nordic A/S, Celldex Therapeutics, Inc., Telesta Therapeutics Inc. and others, some of which have substantially greater financial, technical, sales, marketing, and human resources than we do. These companies might succeed in obtaining regulatory approval for competitive products more rapidly than we can for our products. In addition, competitors might develop technologies and products that are less expensive, safer or more effective than those being developed by us or that would render our technology obsolete. In addition, the pharmaceutical and biotechnology industry is characterized by rapid technological change. Because our research approach integrates many technologies, it may be difficult for us to remain current with the rapid changes in each technology. If we fail to stay at the forefront of technological change, we may be unable to compete effectively. Our competitors may render our technologies obsolete by advancing their existing technological approaches or developing new or different approaches.

We expect to compete with other pharmaceutical and biotechnology companies, and our competitors may:

- develop and market products that are less expensive, more effective or safer than our future products;
- commercialize competing products before we can launch any products developed from our product candidates;
- operate larger research and development programs, possess greater manufacturing capabilities or have substantially greater financial resources than we do;
- initiate or withstand substantial price competition more successfully than we can;

- have greater success in recruiting skilled technical and scientific workers from the limited pool of available talent;
- a more effectively negotiate third-party licenses and strategic relationships; and
- take advantage of acquisition or other opportunities more readily than we can.

We expect to compete for market share against large pharmaceutical and biotechnology companies, smaller companies that are collaborating with larger pharmaceutical companies, new companies, academic institutions, government agencies and other public and private research organizations.

Many major pharmaceutical companies have at least one immunotherapy drug or therapeutic in development, either directly or in partnership with a smaller biotech firm. Some of our competitors that are developing competitive immunology drugs and therapeutics include Merck & Co. Inc., Genentech, Inc. (a member of the Roche Group), Bristol-Myers Squibb Company, Transgene SA, Oxford BioMedica plc; NewLink Genetics Corporation; Celldex Therapeutics, Inc., Pfizer Inc.; and Celgene Corporation.

The primary treatments for non-small cell lung cancer are surgery, radiation, chemotherapy and various combinations of each of these treatments. A large number of patients, particularly with advanced disease, are refractory to these treatments and are subsequently treated with a number of emerging biologic agents, including immunotherapy. Some examples of therapies commonly attempted with stage IIIB/IV NSCLC patients include: nivolumab (Opdivo), pembrolizumab (Keytruda), Alimta (pemetrexed), Avastin (bevacizumab), Tarceva (erlotinib), Gemzar (gemcitabine), Carboplatin, Taxol (paclitaxel), Taxotere (docetaxel), and Vinorelbine. It is unlikely that biologic agents will compete with more traditional therapies in the short-term, but many oncologists believe that such therapies will eventually become the mainstay of lung cancer therapy. None of these agents have proven particularly effective for stage IIIB/IV NSCLC patients, with the most effective therapies only increasing survival by a few months. As a result, we do not consider these agents to be direct competitors to HS-110 because they are likely to be given either in sequence or in conjunction with some of the agents listed. Furthermore, many patients cannot tolerate many of the chemotherapeutics listed. Thus, we believe if HS-110 has a positive safety profile (without observation of local or systemic toxicities, none of which have been seen to date), it is likely that HS-110 would be preferred both by physicians and patients in this stage of disease.

As previously stated we compete with other forms of cancer treatment such as biologic therapies in addition to immunology therapies. There are several biologic therapies in clinical development for NSCLC that have been identified as potential competitors to HS-110. In particular, a cell-based vaccine therapy, Lucanix, is in development by NovaRx. Lucanix has recently completed Phase 3 clinical trials and failed to reach the primary endpoint.

Our strategy is to emphasize what we believe to be our competitive advantages which are that the therapy will have less side effects than most other chemotherapies, will be available at lower prices than other therapies and will work on almost all types of cancer and not just one specific type.

Although all chemotherapy drugs have severe side-effects such as overall damage to the immune system, not only to cancerous cells, leading to hair loss, nausea and vomiting, and considerable pain, etc., the side effects from immunotherapy are typically reduced because immunotherapy works with the body’s own immune response.

According to Schreiber et al, patient-specific vaccines are not more effective than off-the shelf vaccines in reducing tumors. Furthermore, patient-specific vaccines cost far more to produce than off the shelf (allogeneic) vaccines, where any donor tissue can be used. Immunotherapies are reported to cost in excess of $100,000 per year and we expect that our treatment will be less expensive.

Intellectual Property

License Agreements and Intellectual Property

Our goal is to obtain, maintain and enforce patent protection for our products, formulations, processes, methods and other proprietary technologies, preserve our trade secrets and exclusive rights in our unique biological materials, and operate without infringing on the proprietary rights of other parties, both in the United States and in other countries. Our policy is to actively seek to obtain, where appropriate, the strongest intellectual property protection possible for our current product candidates (*ImPACT*® therapy) and any future product candidates, proprietary information and proprietary technology through a combination of contractual arrangements and patents, both in the United States and abroad. However, even patent protection may not always afford us with complete protection against competitors who seek to circumvent our patents. See "Risk Factors - Risks Relating to Our Business – We have limited protection of our intellectual property."

We will continue to depend upon the skills, knowledge and experience of our scientific and technical personnel, as well as that of our advisors, consultants and other contractors, none of which is patentable. To help protect our proprietary know-how, which is not patentable, and for inventions for which patents may be difficult to enforce, we currently rely and will in the future rely on trade secret protection and confidentiality agreements to protect our interests. To this end, we require all of our employees, consultants, advisors and other contractors to enter into confidentiality agreements that prohibit the disclosure of confidential information and, where applicable, require disclosure and assignment to us of the ideas, developments, discoveries and inventions important to our business.

License Agreements

In July 2008, we entered into an exclusive license agreement with the University of Miami (the "University") for intellectual and tangible property rights relating to our *ImPACT*® technology. This license agreement was subsequently assigned to our subsidiary Heat Biologics I, Inc. which issued to the University shares of its common stock representing seven and one half percent (7.5%) of its common stock. The term of the license is the length of the last to expire patent, unless terminated earlier. The license agreement grants Heat Biologics I, Inc. exclusive, worldwide rights to make, use or sell licensed materials based upon the following patent-related rights:

- U.S. patent applications: Serial number 60/075,358 (the"358 application") entitled "Modified Heat Shock Protein-Antigenic Peptide Complex" and filed on February 20, 1998; Serial number 09/253,439 (the " '439 application") entitled "Modified Heat Shock Protein-Antigenic Peptide Complex " and filed on February 19, 1999; serial number 11/878,460 (the " '460 application") entitled "Recombinant Cancer Cell Secreting Modified Heat Shock Protein-Antigenic Peptide Complex" and filed on July 24, 2007; and all U.S. patents and foreign patents and patent applications based on these U.S. applications; as well as all divisionals, continuations, and those claims in continuations-in-parts to the extent they are sufficiently described in the '358, '439, or '460 applications of the foregoing, and any re-examinations or reissues of the foregoing (the "GP96 Vaccine Technology Portfolio").

As consideration for the rights granted in the license agreement, the licensee is obligated to pay the University upfront license fees, additional yearly and milestone payments and a royalty based on net sales of products covered by the patent-related rights set forth above. More specifically, the licensee is obligated to pay the University (i) all past and future patent costs associated with the licensed patent-related rights; (ii) a license issue fee of $150,000; (iii) annual payments of $10,000 in 2010, 2011 and 2012, and $20,000 each year thereafter; (iv) a milestone payment of $250,000 by the earlier of May 31, 2017 or approval of a BLA for the lung cancer vaccine or for a cancer vaccine other than lung cancer; and (v) royalties equal to a percentage (in the low-to-mid single digits) of net sales of licensed products. The royalty rate is subject to reduction if additional license rights from third parties are required to commercialize licensed products. In the event of a sublicense to a third party, Heat Biologics I, Inc. is obligated to pay royalties to the University equal to a percentage of what it would have been required to pay to the University had it sold the products under sublicense itself. In exchange for additional consideration, the University agreed to postpone the payment due dates prior to February 2010 of this license agreement. All past patent costs have been fully paid.

In September 2014, we amended the license agreement in which the University of Miami agreed not to license the cell line to third parties while we are in good standing and in compliance of our patent license agreements with the University relating to our *ImPACT*™ platform. A patent for "Modified Heat Shock Proteins-Antigenic Peptide Complex" if issued from the pending patent applications, would expire in 2019 (worldwide), not including any patent term adjustments or extensions.

In February 2011, our subsidiary, Heat Biologics I, Inc., entered into four additional exclusive license agreements with the University. The terms of each of these additional licenses run until all the patent-related rights licensed therein have expired, unless terminated earlier. In these additional exclusive license agreements, Heat Biologics I, Inc. obtained exclusive, worldwide rights to make, use or sell products covered under the following patent-related rights:

- U.S. patent application serial number 61/347,336 titled "Cancer Treatment" and filed on May 21, 2010, and PCT/US2011/037327 titled "Cancer Treatment" and filed May 20, 2011 and all U.S. patents and foreign patents and patent applications based on these U.S. applications; as well as all divisionals, continuations, and those claims in continuations-in-parts (to the extent they are sufficiently described in the applications) of the foregoing, and any re-examinations or reissues of the foregoing (the "Cancer Treatment Portfolio"). A patent for "Cancer Treatment", if issued from the pending patent applications, would expire in 2031 (worldwide), not including subject to any patent term adjustments or extensions.

- U.S. patent application serial number 61/033,425 titled "Allogeneic Cancer –Based Immunotherapy" and filed on March 3, 2008 and PCT application number PCT/US2009/001330 titled "Allogeneic Cancer –Based Immunotherapy" filed on March 3, 2009, and all U.S. patents and foreign patents and patent applications based on these U.S. applications as well as all divisionals, continuations, and those claims in continuations-in-parts (to the extent they are sufficiently described in the applications) of the foregoing, and any re-examinations or reissues of the foregoing (the "Allogeneic Cancer –Based Immunotherapy Portfolio"). A patent for "Allogeneic Cancer –Based Immunotherapy", if issued from the pending applications, would expire in 2029 (worldwide), not including any patent term adjustments or extensions

- U.S. patent application serial number 61/033,425 titled "Heat Shock Protein GP96 Vaccination and Methods of Using Same" filed on March 20, 2008 and PCT application number PCT/US2009/001727 titled "Heat Shock Protein GP96 Vaccination and Methods of Using Same "filed on March 19, 2009, and all U.S. patents and foreign patents and patent applications based on these U.S. applications as well as all divisionals, continuations, and those claims in continuations-in-parts (to the extent they are sufficiently described in the applications) of the foregoing, and any re-examinations or reissues of the foregoing (the "Heat Shock Protein GP96 Vaccination Portfolio"). A patent for "Heat Shock Protein GP96 Vaccination and Methods of Using Same", if issued from the pending applications, would expire in 2029 (worldwide), not including any patent term adjustments or extensions.

- U.S. patent application serial number 61/116.971 titled "HIV/SIV Vaccine for the Generation of Mucosal and Systemic Immunity" filed November 21, 2008 and PCT application number PCT/US2009/065500 titled "HIV/SIV Vaccine for the Generation of Mucosal and Systemic Immunity" filed on November 23, 2009 and all U.S. patents and foreign patents and patent applications based on these U.S. applications as well as all divisionals, continuations, and those claims in continuations-in-parts (to the extent they are sufficiently described in the applications) of the foregoing, and any re-examinations or reissues of the foregoing (the "HIV/SIV Vaccine Portfolio"). A patent for "HIV/SIV Vaccine for the Generation of Mucosal and Systemic Immunity", if issued from the pending applications, would expire in 2029 (worldwide), not including any patent term adjustments or extensions.

As consideration for the rights granted in these additional four license agreements, the licensee is obligated to pay the University certain upfront license fees, past and future patent costs and royalties based on net sales of commercialized products covered by the patent-related rights set forth above. No annual or milestone payments are required under any of these four additional license agreements. The upfront license fees for the Cancer Treatment Portfolio and the HIV/SIV Vaccine Portfolio license agreements are $10,000 and $50,000, respectively. No upfront license fees were required under the license agreements for the Allogeneic Cancer–Based Immunotherapy and the Heat Shock Protein GP96 portfolios. Under each of these four additional license agreements, the royalties are equal to a percentage (in the low-to-mid single digits) of net sales of products covered by the patent-related rights in the respective license agreements. These royalty rates are subject to reduction if additional license rights from third parties are required to commercialize licensed products. In the event of a sublicense to a third party, Heat Biologics I, Inc. is obligated to pay royalties to the University equal to a percentage of what it would have been required to pay to the University had it sold the products under sublicense itself. Each of these additional license agreements also provides that the licensee will not have to pay more than the above-noted royalty rates and sublicense fees if more than one license from the University is required to sell products covered by the licensed patent-related rights. In exchange for additional consideration (including the requirement that Heat Biologics I, Inc. pay additional milestone payments of $25,000 before initiation of any Phase 3 clinical trials for products covered by any of the license agreements, and an additional payment equal to 18% annual interest on the amounts due or a note convertible into an equivalent value of shares in our Preferred Stock), the University agreed to postpone the payment due dates prior to February 2010 for each of these four additional licenses.

All five of the above-described license agreements provide that the licensor has the right to terminate a subject license if the licensee has (i) not introduced, or at least used its best efforts to introduce, a licensed product in the commercial marketplace in the United States, European Union, or Japan by December 31, 2020; (ii) not otherwise exercise diligence to bring licensed products to market; or (iii) files, or has filed against it, a proceeding under the Bankruptcy Act, is adjudged insolvent, makes an assignment for the benefit of its creditors, or has an unreleased or unsatisfied writ of attachment or execution levied upon it.

In March 2014, our subsidiary, Heat Biologics I, Inc., entered into an additional exclusive license agreement with the University. The term of this license runs until all the patent-related rights licensed therein have expired, unless terminated earlier. In this exclusive license agreement, Heat Biologics I, Inc. obtained exclusive, worldwide rights to make, use or sell products covered under the University's interest in the following patent-related rights:

- U.S. Provisional Patent Application serial number 61/445,884 titled"Combined Cell Based Gp96-IG-SIV/HIV; Recombinant Gp120 Protein Vaccination For Protection From SIV/HIV" and filed February 23, 2011 (the"884 application"); PCT Application Serial No. PCT/US2012/26256 titled "Combined Cell Based Gp96-IG-SIV/HIV, Recombinant Gp120 Protein Vaccination For Protection From SIV/HIV" filed February 23, 2012 (the " '256 application"); and all U.S. patents and foreign patents and patent applications based on these applications; as well as all divisionals, continuations, and those claims in continuations-in-parts (to the extent they are sufficiently described in the '884 or '256 applications) of the foregoing, and any re-examinations or reissues of the foregoing (the "Combination HIV/SIV Vaccine Portfolio"). A patent for "Combined Cell Based Gp96-IG-SIV/HIV; Recombinant Gp120 Protein Vaccination For Protection From SIV/HIV," if issued from the pending applications, would expire in 2032 (worldwide), not including any patent term adjustments or extensions.

The patent rights in the Combination HIV/SIV Vaccine Portfolio are co-owned by the University and the National Institutes of Health (the "NIH"). Heat Biologics I, Inc. has only licensed the University's rights therein. The NIH's rights in this portfolio have not been licensed by Heat Biologics I, Inc. As consideration for the rights granted in this license agreement, the licensee is obligated to pay the University an upfront license fee, past patent costs, and royalties based on net sales on commercialized products covered by the patent-related rights set forth above. No annual payments are required under this license agreement. The licensee is obligated to make milestone payments under this license agreement as follows: $50,000 upon completion of a phase I clinical trial, $100,000 upon completion of a phase II trial, $100,000 upon completion of a phase III trial, and $100,000 upon acceptance of a BLA by the FDA or its foreign equivalent. Under this license agreement, the royalties are equal to a percentage (low single digits) of net sales of products covered by the patent-related rights. This royalty rate is subject to reduction if additional license rights from third parties are required to commercialize licensed products. In the event of a sublicense to a third party, Heat Biologics I, Inc. is obligated to pay royalties to the University equal to a percentage of what it would have been required to pay to the University had it sold the products under sublicense itself. This license agreement also provides that the licensee will not have to pay more than the above sublicense fees or a royalty in the low-to-mid single digits if more than one license from the University is required to sell products covered by the licensed patent-related rights. The licensor has the right to terminate this license if the licensee has (i) not introduced, or at least use its best efforts to introduce, a licensed product in the commercial marketplace in the United States, European Union, or Japan by December 31, 2023; (ii) not otherwise exercised diligence to bring licensed products to market; or (iii) files, or has filed against it, a proceeding under the Bankruptcy Act, is adjudged insolvent, makes an assignment for the benefit of its creditors, or has an unreleased or unsatisfied writ of attachment or execution levied upon it.

Upon an uncured material breach of an obligation under any one of the above six license agreements by a party, the other party has the right to terminate that agreement upon 90 days notice or 30 days notice if the breach relates to payments due to the University. In the event of a termination, Heat Biologics I, Inc. will be obligated to pay all amounts that accrued prior to such termination. Each of the above license agreements also contains other customary clauses and terms as are common in similar agreements between industry and academia, including the licensee's agreement to indemnify the University for liabilities arising out of the negligence of the licensee, making the license grant subject to the Bayh-Dole act (35 U.S.C. 200 et seq.), the reservation of the licensor of the right to use the licensed intellectual property rights for its internal, non-commercial purposes, limitations/disclaimers of various warranties and representations, reporting and record-keeping requirements, and licensee liability insurance requirements.

Under the above-described license agreements with the University, we have obtained exclusive rights to six different patent families. The six patent families associated with our *ImPACT*® and *ComPACT*™ platform are:

"Recombinant cancer cell secreting modified heat shock protein-antigenic peptide complex."

This family of patent filings relates to methods and compositions for enhancing an immune response. More particularly, the application describes the creation of a tumor cell therapy including a cancer cell that has been engineered to secrete a heat shock protein (gp96), and the use of such therapy to enhance an anti-tumor immune response. Within this family are eight (8) issued patents covering the United States, Australia, Canada, Japan and Europe (collectively validated in 28 countries) and one (1) pending U.S. application. Not including any patent term adjustments or extensions (e.g., for patent office delays or extensions/exclusivity periods provided for new drug approvals in the United States and some foreign countries), the term for patents in this family extends until 2019.

"Heat Shock Protein gp96 Vaccination and Methods of Using Same"

This family of patent filings also relates to methods and compositions for enhancing an immune response. It further describes: (a) how intraperitoneal gp96-Ig administration increases recruitment of innate immune cells into the administration site, mediates proliferation of dendritic cells (DCs) and CD8 cells, and activates natural killer (NK) cells; (b) that gp96-Ig-secreting cell vaccines are more effective when gp96-Ig is continuously released; (c) that frequent gp96 immunizations can overcome tumor-induced immune suppression and retards tumor growth; and (d) that B cell depletion can enhance gp96-Ig -mediated recruitment of NK cells and retention of DCs in the administration site. Within this family are one issued United States patent and one issued Australian patent, and one pending application each in Canada, Europe, Israel and India. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2029.

“Allogeneic Cancer Cell Based Immunotherapy”

This family of patent filings also relates to methods and compositions for enhancing an immune response. It further describes: (a) making vaccines cells allogeneic by expressing exogenous major histocompatibility complex (MHC) antigens; (b) B cell depletion to augment the effectiveness of the vaccines; and (c) the enhancement of anti-tumor immune responses using multiple immunizations less than two weeks apart. Within this family are one issued Australian patent, two issued U.S. patents, one issued European patent, one issued Israeli patent and one pending application each in Canada, China, Europe, India, Japan, and South Korea. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2029.

“Cancer Treatment”

This family of patent filings contains results from a Phase 1 clinical trial of human subjects with cancer. Within this family are one pending application each in the United States, Canada, Australia, India and South Korea. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2031.

“HIV/SIV Vaccines to Generate Mucosal and Systemic Immunity” This patent family relates to the use of host cells that have been engineered to secrete a heat shock protein (gp96) to treat various chronic viral infections including those caused by HIV. Within this family are one granted Australian patent, one granted South African patent, and one pending application each in Canada and India. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2029.

“Combined Cell Based Gp96-Ig-SIV/HIV, Recombinant Gp120 Protein Vaccination for Protection From SIV/HIV”

This patent family relates to combination therapies for treating chronic viral infections including HIV. The combination therapy uses host cells that have been engineered to secrete a heat shock protein (gp96) to induce antiviral T cell responses and soluble viral antigens to induce antiviral antibody responses. Within this family are one issued patent in South Africa and one pending application each in Canada, Europe, Hong Kong, India, South Korea, and the Philippines. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2032.

In July 2011, we exercised an option agreement with U.Mich and entered into a license agreement with U.Mich pursuant to which we are UMich’s exclusive licensee and have the right to use, market, offer for sale, sell and/or sublicense materials and processes related to certain cancer cell lines. The term of the license is perpetual, unless terminated earlier by us or by U.Mich where U.Mich can only terminate for our material breach of this agreement. As consideration for the rights granted in the license agreement, we agreed to pay U.Mich up-front license fees and additional yearly and milestone payments. We also assumed under the license agreement responsibility for any infringement of third party rights caused by our use of the licensed materials. We paid an option fee of $2,000, a license issue fee of $10,000 and are obligated to pay an annual maintenance fee of $10,000 each year until the first commercial sale of a licensed product at which time the annual maintenance fee increases to $50,000. In addition, we are obligated to make milestone payments of $25,000, $50,000 and $75,000 upon completion of a Phase 1, Phase 2 and Phase 3 trial and $250,000 upon the first commercial sale of a licensed product and $350,000 upon annual net sales of $100,000,000 or more. The license agreements provide that the licensor has the right to terminate the license should we cease to carry on our business, fail to make a required payment or otherwise materially breach or default in our obligations under the license agreement following the giving of notice and an opportunity to cure any such breach. The license agreement provides that if we do not achieve the following milestones within the required period, U.Mich has the right to terminate the license agreement: completion of a Phase 1 clinical trial on or before January 1, 2015, a Phase 2 clinical trial on or before January 1, 2017, a Phase 3 clinical trial on or before January 1, 2019 and the first commercial sale of a product that includes the materials supplied by U.Mich on or before January 1, 2020. The license agreement also contains other customary clauses and terms as are common in similar agreements between industry and academia.

In April 2011, we entered into an evaluation and biological material license agreement with the ATCC to evaluate, use, market, offer for sale, sell and/or sublicense materials and processes related to various different cell lines. In October 2013 and March 2014, this agreement was amended to add additional cell lines in exchange for additional fees. The agreement with ATCC provides for an evaluation term of 12 months subject to two additional renewals, and a non-exclusive commercial use license upon termination of the evaluation period to utilize the products we obtain in the evaluation to develop, make, use and sell licensed products. The October 2013 amendment also increased the number of evaluation renewals to a total of five. The agreement with ATCC has a term of 40 years. We paid an evaluation fee and four renewal evaluation fees totaling $25,000, and are obligated to pay a $50,000 fee upon initiation of the commercial license and a less than 1% royalty based on sales of licensed products. In addition, we are obligated to make milestone payments of $15,000, $30,000 and $60,000 upon initiation of a Phase 1, Phase 2, and Phase 3 trial, respectively; and $200,000 upon receipt of marketing authorization. In December 2015, we amended this agreement with ATCC to add additional cell lines in exchange for additional fees.

In September 2014, we entered into an exclusive license agreement for a multiple myeloma cell line with Professor Kenneth Nilsson in Sweden for the production, sale and use for immunotherapy, including the prevention or treatment of disease with substances, synthetic or biologic, that modulate the immune response and specifically exclude the use of the said cell line for discovery of any other therapeutics. The term of the license is perpetual, unless terminated earlier by us or by Professor Kenneth Nilsson where Profession Nilsson can only terminate for our material breach of this agreement. As consideration for the rights granted in the license agreement, we paid an up-front license fee of $5,000 and are obligated to pay an annual maintenance fee of $3,000 each year until the first commercial sale of a licensed product at which time the annual maintenance fee increases to $30,000. In the license agreement, we agreed to pay royalties equal to a one-tenth of low single digit percentage of net sales of licensed products. In addition, we are obligated to make milestone payments of $12,000, $20,000 and $40,000 upon completion of a Phase 1, Phase 2 and Phase 3 trial and $100,000 upon the first commercial sale of a licensed product and $200,000 upon annual net sales of $100,000,000 or more. The license agreements provide that the licensor has the right to terminate the license should we cease to carry on our business, fail to make a required payment or otherwise materially breach or default in our obligations under the license agreement following the giving of notice and an opportunity to cure any such breach. There are no timelines to achieve the above milestones. The license agreement also contains other customary clauses and terms as are common in similar agreements between industry and academia.

In August 2015, we entered into an exclusive license agreement with Columbia University for an endometrial cancer cell line for the production, sale and use for all human healthcare applications. The term of the license is perpetual, unless terminated earlier by us or by Columbia University where Columbia University can only terminate for our material breach of this agreement. As consideration for the rights granted in the license agreement, we paid an up-front license fee of $7,500 and are obligated to pay an annual maintenance fee of $5,000 each year until the first commercial sale of a licensed product at which time the annual maintenance fee increases to $50,000. In the license agreement, we agreed to pay royalties equal to a one-tenth of low single digit percentage of net sales of licensed products. In addition, we are obligated to make milestone payments of $25,000, $40,000 and $75,000 upon completion of a Phase 1, Phase 2 and Phase 3 trial and $200,000 upon the first commercial sale of a licensed product and $500,000 upon annual net sales of $100,000,000 or more. The license agreements provide that the licensor has the right to terminate the license should we cease to carry on our business, fail to make a required payment or otherwise materially breach or default in our obligations under the license agreement following the giving of notice and an opportunity to cure any such breach. There are no timelines to achieve the above milestones. The license agreement also contains other customary clauses and terms as are common in similar agreements between industry and academia.

With enhanced internal research and development capabilities, in 2015-2016, we filed five (5) provisional applications, one U.S. non-provisional application, and two (2) PCT applications relating to new technologies developed by the Company. Together, our *ImPACT®/ComPACT™* patent portfolio comprises eighteen (18) issued patents and thirty-one (31) pending patent applications. These patents and applications cover the United States, Europe, and Japan as well as several other countries having commercially significant markets.

Government Regulation

FDA Approval Process

In the United States, pharmaceutical products are subject to extensive regulation by the U.S. Food and Drug Administration, or the FDA. The Federal Food, Drug, and Cosmetic Act, (the "FDC Act"), and other federal and state statutes and regulations, govern, among other things, the research, development, testing, manufacture, storage, recordkeeping, approval, labeling, promotion and marketing, distribution, post-approval monitoring and reporting, sampling, and import and export of pharmaceutical products. Biological products used for the prevention, treatment, or cure of a disease or condition of a human being are subject to regulation under the FDC Act, except the section of the FDC Act which governs the approval of new drug applications, or NDAs. Biological products are approved for marketing under provisions of the Public Health Service Act, or PHSA, via a Biologics License Application, or BLA. However, the application process and requirements for approval of BLAs are very similar to those for NDAs, and biologics are associated with similar approval risks and costs as drugs. Failure to comply with applicable U.S. requirements may subject a company to a variety of administrative or judicial sanctions, such as FDA refusal to approve pending NDAs or BLAs, warning or untitled letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties, and criminal prosecution.

Pharmaceutical product development for a new product or certain changes to an approved product in the United States typically involves preclinical laboratory and animal tests, the submission to the FDA of an investigational new drug application, or IND, which must become effective before clinical testing may commence, and adequate and well-controlled clinical trials to establish the safety and effectiveness of the drug for each indication for which FDA approval is sought. Satisfaction of FDA pre-market approval requirements typically takes many years and the actual time required may vary substantially based upon the type, complexity, and novelty of the product or disease.

Preclinical tests include laboratory evaluation of product chemistry, formulation, and toxicity, as well as animal trials to assess the characteristics and potential safety and efficacy of the product. The conduct of the preclinical tests must comply with federal regulations and requirements, including good laboratory practices. The results of preclinical testing are submitted to the FDA as part of an IND along with other information, including information about product chemistry, manufacturing and controls, and a proposed clinical trial protocol. Long term preclinical tests, such as animal tests of reproductive toxicity and carcinogenicity, may continue after the IND is submitted.

A 30-day waiting period after the submission of each IND is required prior to the commencement of clinical testing in humans. If the FDA has neither commented on nor questioned the IND within this 30-day period, the clinical trial proposed in the IND may begin.

Clinical trials involve the administration of the investigational new drug or biologic to healthy volunteers or patients under the supervision of a qualified investigator. Clinical trials must be conducted: (i) in compliance with federal regulations; (ii) in compliance with good clinical practice, or GCP, an international standard meant to protect the rights and health of patients and to define the roles of clinical trial sponsors, administrators, and monitors; as well as (iii) under protocols detailing the objectives of the trial, the parameters to be used in monitoring safety, and the effectiveness criteria to be evaluated. Each protocol involving testing on U.S. patients and subsequent protocol amendments must be submitted to the FDA as part of the IND.

The FDA may order the temporary, or permanent, discontinuation of a clinical trial at any time, or impose other sanctions, if it believes that the clinical trial either is not being conducted in accordance with FDA requirements or presents an unacceptable risk to the clinical trial patients. The study protocol and informed consent information for patients in clinical trials must also be submitted to an institutional review board, or IRB, for approval. An IRB may also require the clinical trial at the site to be halted, either temporarily or permanently, for failure to comply with the IRB's requirements, or may impose other conditions.

Clinical trials to support NDAs or BLAs for marketing approval are typically conducted in three sequential phases, but the phases may overlap. In Phase 1, the initial introduction of the drug or biologic into healthy human subjects or patients, the product is tested to assess metabolism, pharmacokinetics, pharmacological actions, side effects associated with increasing doses, and, if possible, early evidence on effectiveness. Phase 2 usually involves trials in a limited patient population to determine the effectiveness of the drug or biologic for a particular indication, dosage tolerance, and optimum dosage, and to identify common adverse effects and safety risks. If a compound demonstrates evidence of effectiveness and an acceptable safety profile in Phase 2 evaluations, Phase 3 trials are undertaken to obtain the additional information about clinical efficacy and safety in a larger number of patients, typically at geographically dispersed clinical trial sites, to permit the FDA to evaluate the overall benefit-risk relationship of the drug or biologic and to provide adequate information for the labeling of the product. In most cases, the FDA requires two adequate and well-controlled Phase 3 clinical trials to demonstrate the efficacy of the drug or biologic. A single Phase 3 trial with other confirmatory evidence may be sufficient in rare instances where the study is a large multicenter trial demonstrating internal consistency and a statistically very persuasive finding of a clinically meaningful effect on mortality, irreversible morbidity or prevention of a disease with a potentially serious outcome and confirmation of the result in a second trial would be practically or ethically impossible.

After completion of the required clinical testing, an NDA or BLA is prepared and submitted to the FDA. FDA approval of the NDA or BLA is required before marketing of the product may begin in the United States. The NDA or BLA must include the results of all preclinical, clinical, and other testing and a compilation of data relating to the product's pharmacology, chemistry, manufacture, and controls. The cost of preparing and submitting an NDA or BLA is substantial. The submission of most NDAs and BLAs is additionally subject to a substantial application user fee, currently exceeding $2,335,200, and the manufacturer and/or sponsor under an approved new drug application are also subject to annual product and establishment user fees, currently exceeding $110,370 per product and $569,200 per establishment. These fees are typically increased annually.

The FDA has 60 days from its receipt of an NDA or BLA to determine whether the application will be accepted for filing based on the agency's threshold determination that it is sufficiently complete to permit substantive review. Once the submission is accepted for filing, the FDA begins an in-depth review. The FDA has agreed to certain performance goals in the review of NDAs and BLAs. Most such applications for standard review drug or biologic products are reviewed within ten to 12 months; most applications for priority review drugs or biologics are reviewed in six to eight months. The FDA can extend these reviews by three months. Priority review can be applied to drugs that the FDA determines offer major advances in treatment, or provide a treatment where no adequate therapy exists. For biologics, priority review is further limited only for products intended to treat a serious or life-threatening disease relative to the currently approved products. The review process for both standard and priority review may be extended by the FDA for three additional months to consider certain late-submitted information, or information intended to clarify information already provided in the submission.

The FDA may also refer applications for novel drug or biologic products, or drug or biologic products that present difficult questions of safety or efficacy, to an advisory committee – typically a panel that includes clinicians and other experts – for review, evaluation, and a recommendation as to whether the application should be approved. The FDA is not bound by the recommendation of an advisory committee, but it generally follows such recommendations. Before approving an NDA or BLA, the FDA will typically inspect one or more clinical sites to assure compliance with GCP. Additionally, the FDA will inspect the facility or the facilities at which the drug is manufactured. FDA will not approve the product unless compliance with current good manufacturing practice, or cGMP, is satisfactory and the NDA or BLA contains data that provide substantial evidence that the drug or biologic is safe and effective in the indication studied.

After the FDA evaluates the NDA or BLA and the manufacturing facilities, it issues either an approval letter or a complete response letter. A complete response letter generally outlines the deficiencies in the submission and may require substantial additional testing, or information, in order for the FDA to reconsider the application. If, or when, those deficiencies have been addressed to the FDA's satisfaction in a resubmission of the NDA or BLA, the FDA will issue an approval letter. The FDA has committed to reviewing such resubmissions in two or nine months depending on the type of information included.

An approval letter authorizes commercial marketing of the drug or biologic with specific prescribing information for specific indications. As a condition of NDA or BLA approval, the FDA may require a risk evaluation and mitigation strategy, or REMS, to help ensure that the benefits of the drug or biologic outweigh the potential risks. REMS can include medication guides, communication plans for healthcare professionals, and elements to assure safe use, or ETASU. ETASU can include, but are not limited to, special training or certification for prescribing or dispensing, dispensing only under certain circumstances, special monitoring, and the use of patient registries. The requirement for a REMS can materially affect the potential market and profitability of the product. Moreover, product approval may require substantial post-approval testing and surveillance to monitor the product's safety or efficacy. Once granted, product approvals may be withdrawn if compliance with regulatory standards is not maintained or problems are identified following initial marketing.

Changes to some of the conditions established in an approved application, including changes in indications, labeling, or manufacturing processes or facilities, require submission and FDA approval of a new NDA or BLA or NDA or BLA supplement before the change can be implemented. An NDA or BLA supplement for a new indication typically requires clinical data similar to that in the original application, and the FDA uses the same procedures and actions in reviewing NDA or BLA supplements as it does in reviewing NDAs or BLAs.

Post-Approval Requirements

Once an NDA or BLA is approved, a product will be subject to certain post-approval requirements. For instance, the FDA closely regulates the post-approval marketing and promotion of drugs and biologics, including standards and regulations for direct-to-consumer advertising, off-label promotion, industry-sponsored scientific and educational activities and promotional activities involving the internet. Drugs and biologics may be marketed only for the approved indications and in accordance with the provisions of the approved labeling.

Adverse event reporting and submission of periodic reports is required following FDA approval of an NDA or BLA. The FDA also may require post-marketing testing, known as Phase 4 testing, REMS, and surveillance to monitor the effects of an approved product, or the FDA may place conditions on an approval that could restrict the distribution or use of the product. In addition, quality control, drug manufacture, packaging, and labeling procedures must continue to conform to cGMPs after approval. Drug and biologic manufacturers and certain of their subcontractors are required to register their establishments with the FDA and certain state agencies. Registration with the FDA subject entities to periodic unannounced inspections by the FDA, during which the agency inspects manufacturing facilities to assess compliance with cGMPs. Accordingly, manufacturers must continue to expend time, money, and effort in the areas of production and quality-control to maintain compliance with cGMPs. Regulatory authorities may withdraw product approvals or request product recalls if a company fails to comply with regulatory standards, if it encounters problems following initial marketing, or if previously unrecognized problems are subsequently discovered.

Orphan Drugs

Under the Orphan Drug Act, the FDA may grant orphan drug designation to drugs or biologics intended to treat a rare disease or condition – generally a disease or condition that affects fewer than 200,000 individuals in the United States. Orphan drug designation must be requested before submitting an NDA or BLA. After the FDA grants orphan drug designation, the generic identity of the drug or biologic and its potential orphan use are disclosed publicly by the FDA. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. The first NDA or BLA applicant to receive FDA approval for a particular active ingredient to treat a particular disease with FDA orphan drug designation is entitled to a seven-year exclusive marketing period in the United States for that product, for that indication. During the seven-year exclusivity period, the FDA may not approve any other applications to market the same drug or biologic for the same disease, except in limited circumstances, such as a showing of clinical superiority to the product with orphan drug exclusivity. Orphan drug exclusivity does not prevent the FDA from approving a different drug or biologic for the same disease or condition, or the same drug or biologic for a different disease or condition. Among the other benefits of orphan drug designation are tax credits for certain research and a waiver of the NDA or BLA application user fee.

Fast Track Designation and Accelerated Approval

The FDA is required to facilitate the development, and expedite the review, of drugs or biologics that are intended for the treatment of a serious or life-threatening disease or condition for which there is no effective treatment and which demonstrate the potential to address unmet medical needs for the condition. Under the fast track program, the sponsor of a new drug or biologic candidate may request that the FDA designate the candidate for a specific indication as a fast track drug or biologic concurrent with, or after, the filing of the IND for the candidate. The FDA must determine if the drug or biologic candidate qualifies for fast track designation within 60 days of receipt of the sponsor's request.

Under the fast track program and FDA's accelerated approval regulations, the FDA may approve a drug or biologic for a serious or life-threatening illness that provides meaningful therapeutic benefit to patients over existing treatments based upon a surrogate endpoint that is reasonably likely to predict clinical benefit, or on a clinical endpoint that can be measured earlier than irreversible morbidity or mortality, that is reasonably likely to predict an effect on irreversible morbidity or mortality or other clinical benefit, taking into account the severity, rarity, or prevalence of the condition and the availability or lack of alternative treatments.

In clinical trials, a surrogate endpoint is a measurement of laboratory or clinical signs of a disease or condition that substitutes for a direct measurement of how a patient feels, functions, or survives. Surrogate endpoints can often be measured more easily or more rapidly than clinical endpoints. A drug or biologic candidate approved on this basis is subject to rigorous post-marketing compliance requirements, including the completion of Phase 4 or post-approval clinical trials to confirm the effect on the clinical endpoint. Failure to conduct required post-approval studies, or confirm a clinical benefit during post-marketing studies, will allow the FDA to withdraw the drug or biologic from the market on an expedited basis. All promotional materials for drug candidates approved under accelerated regulations are subject to prior review by the FDA.

In addition to other benefits such as the ability to use surrogate endpoints and engage in more frequent interactions with the FDA, the FDA may initiate review of sections of a fast track product's NDA or BLA before the application is complete. This rolling review is available if the applicant provides, and the FDA approves, a schedule for the submission of the remaining information and the applicant pays applicable user fees. However, the FDA's time period goal for reviewing an application does not begin until the last section of the NDA or BLA is submitted. Additionally, the fast track designation may be withdrawn by the FDA if the FDA believes that the designation is no longer supported by data emerging in the clinical trial process.

On March 5, 2015, we were notified that the FDA granted FAST Track designation for HS-410 for the treatment of non-muscle invasive bladder cancer. We believe that this designation will expedite our development of HS-410.

Pediatric Information

Under the Pediatric Research Equity Act, or PREA, NDAs or BLAs or supplements to NDAs or BLAs must contain data to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the drug is safe and effective. The FDA may grant full or partial waivers, or deferrals, for submission of data. Unless otherwise required by regulation, PREA does not apply to any drug for an indication for which orphan designation has been granted.

Additional Controls for Biologics

To help reduce the increased risk of the introduction of adventitious agents, the PHSA emphasizes the importance of manufacturing controls for products whose attributes cannot be precisely defined. The PHSA also provides authority to the FDA to immediately suspend licenses in situations where there exists a danger to public health, to prepare or procure products in the event of shortages and critical public health needs, and to authorize the creation and enforcement of regulations to prevent the introduction or spread of communicable diseases in the United States and between states.

After a BLA is approved, the product may also be subject to official lot release as a condition of approval. As part of the manufacturing process, the manufacturer is required to perform certain tests on each lot of the product before it is released for distribution. If the product is subject to official release by the FDA, the manufacturer submits samples of each lot of product to the FDA together with a release protocol showing a summary of the history of manufacture of the lot and the results of all of the manufacturer's tests performed on the lot. The FDA may also perform certain confirmatory tests on lots of some products, such as viral vaccines, before releasing the lots for distribution by the manufacturer. In addition, the FDA conducts laboratory research related to the regulatory standards on the safety, purity, potency, and effectiveness of biological products. As with drugs, after approval of biologics, manufacturers must address any safety issues that arise, are subject to recalls or a halt in manufacturing, and are subject to periodic inspection after approval.

Biosimilars

The Biologics Price Competition and Innovation Act of 2009, or BPCIA, creates an abbreviated approval pathway for biological products shown to be highly similar to or interchangeable with an FDA-licensed reference biological product. Biosimilarity sufficient to reference a prior FDA-approved product requires that there be no differences in conditions of use, route of administration, dosage form, and strength, and no clinically meaningful differences between the biological product and the reference product in terms of safety, purity, and potency. Biosimilarity must be shown through analytical studies, animal studies, and at least one clinical study, absent a waiver by the Secretary. A biosimilar product may be deemed interchangeable with a prior approved product if it meets the higher hurdle of demonstrating that it can be expected to produce the same clinical results as the reference product and, for products administered multiple times, the biologic and the reference biologic may be switched after one has been previously administered without increasing safety risks or risks of diminished efficacy relative to exclusive use of the reference biologic. No biosimilar or interchangeable products have been approved under the BPCIA to date. Complexities associated with the larger, and often more complex, structures of biological products, as well as the process by which such products are manufactured, pose significant hurdles to implementation which are still being evaluated by the FDA.

A reference biologic is granted 12 years of exclusivity from the time of first licensure of the reference product, and no application for a biosimilar can be submitted for four years from the date of licensure of the reference product. The first biologic product submitted under the abbreviated approval pathway that is determined to be interchangeable with the reference product has exclusivity against a finding of interchangeability for other biologics for the same condition of use for the lesser of (i) one year after first commercial marketing of the first interchangeable biosimilar, (ii) 18 months after the first interchangeable biosimilar is approved if there is no patent challenge, (iii) 18 months after resolution of a lawsuit over the patents of the reference biologic in favor of the first interchangeable biosimilar applicant, or (iv) 42 months after the first interchangeable biosimilar's application has been approved if a patent lawsuit is ongoing within the 42-month period.

Cell and Tissue Based Biologics

Establishments that manufacture cell and tissue based products must comply with the FDA's current good tissue practices, or cGTP, which are FDA regulations that govern the methods used in, and the facilities and controls used for, the manufacture of such products. The primary intent of the cGTP requirements is to ensure that cell and tissue based products are manufactured in a manner designed to prevent the introduction, transmission and spread of communicable disease. FDA regulations also include requirements for a unified registration and listing system, donor screening and testing, adverse reaction reporting, and labeling.

Cell and tissue-based products may also be subject to the same approval standards, including demonstration of safety and efficacy, as other biologic and drug products if they meet certain criteria such as if the cells or tissues are more than minimally manipulated or if they are intended for a non-homologous use. Products manufactured using the *ImPACT*® technology meet this threshold and therefore are considered biological drugs. Manufacture of*ImPACT*® products are subject to both cGTP and cGMP regulations for manufacturing quality. Marketing of these products in the United States will require FDA approval under the BLA pathway as discussed above.

Disclosure of Clinical Trial Information

Sponsors of clinical trials of FDA-regulated products, including drugs, are required to register and disclose certain clinical trial information. Our lung and bladder cancer trials have been registered on clinicaltrials.gov, which registration has been updated to reflect the recent discovery of the identity of the cell line used in our bladder cancer trial. Information related to the product, patient population, phase of investigation, study sites and investigators, and other aspects of the clinical trial is then made public as part of the registration. Sponsors are also obligated to discuss the results of their clinical trials after completion. Disclosure of the results of these trials can be delayed until the new product or new indication being studied has been approved. Competitors may use this publicly available information to gain knowledge regarding the progress of development programs.

Non-U.S. Regulation

Before our products can be marketed outside of the United States, they are subject to regulatory approval of the respective authorities in the country in which the product should be marketed. The requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary widely from country to country. No action can be taken to market any product in a country until an appropriate application has been approved by the regulatory authorities in that country. The current approval process varies from country to country, and the time spent in gaining approval varies from that required for FDA approval. In certain countries, the sales price of a product must also be approved. The pricing review period often begins after market approval is granted. Even if a product is approved by a regulatory authority, satisfactory prices might not be approved for such product.

In Europe, marketing authorizations may be submitted at a centralized, a decentralized or national level; however, the centralized procedure is mandatory for the approval of biotechnology products and provides for the grant of a single marketing authorization that is valid in all European Union member states. There can be no assurance that the chosen regulatory strategy will secure regulatory approval on a timely basis or at all.

While we intend to market our products outside the United States in compliance with our respective license agreements, we have not made any applications with non-U.S. authorities and have no timeline for such applications or marketing.

Research and Development

We have built an internal and external research and development organization that includes expertise in discovery research, preclinical development, product formulation, analytical and medicinal chemistry, manufacturing, clinical development and regulatory and quality assurance. We engage third parties on a limited basis to conduct portions of our preclinical research; however, we are not substantially dependent upon any third parties for our preclinical research nor do any of these third parties conduct a major portion of our preclinical research. Research and development expenses were $2.6 million and $2.9 million during the years ended December 31, 2015 and 2014, respectively.

Employees

As of December 31, 2015, we had a total of 25 employees, of which 24 are full-time employees and 1 is part-time. We believe our relationships with our employees are satisfactory. None of our employees is represented by a labor union. We anticipate that we will need to identify, attract, train and retain other highly skilled personnel to pursue our development program. Hiring for such personnel is competitive, and there can be no assurance that we will be able to retain our key employees or attract, assimilate or retain the qualified personnel necessary for the development of our business.

Legal Proceedings

There are currently no pending legal proceedings against the Company or its subsidiaries.

Our Common Stock Listing and Holders

Market Information

Our common stock has traded on the NASDAQ Capital Market under the symbol "HTBX" since July 29, 2013. Prior to that time, there was no public market for our common stock. The following table states the range of the high and low sales prices of our common stock for the first quarter of 2016 through March 7, 2016 and for each quarter during the year ended December 31, 2015 and the year ended December 31, 2014, respectively. These quotations represent inter-dealer prices, without retail mark-up, markdown, or commission, and may not represent actual transactions. The last reported sale price of our common stock as reported on the NASDAQ on March 7, 2016 was $0.94 per share.

	High	Low
YEAR ENDED DECEMBER 31, 2014		
First Quarter	$ 9.29	$ 6.09
Second Quarter	$ 6.80	$ 3.95
Third Quarter	$ 6.98	$ 3.81
Fourth Quarter	$ 7.31	$ 3.89
YEAR ENDED DECEMBER 31, 2015		
First Quarter	$ 8.30	$ 3.99
Second Quarter	$ 8.35	$ 5.73
Third Quarter	$ 6.58	$ 3.42
Fourth Quarter	$ 4.50	$ 1.84
YEAR ENDED DECEMBER 31, 2016		
First Quarter of 2016 through March 7, 2016	$ 4.32	$ 0.94

Equity Compensation Plan Information

Securities Authorized for Issuance Under Equity Compensation Plans

The following table contains information about our equity compensation plans as of December 31, 2015.

Equity Compensation Plan Information

Plan Category	Number of securities to be issued upon exercise of outstanding options (a)	Weighted-average exercise price of outstanding options (b)	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in column (a)) (c)
Equity compensation plans approved by security holders			
2009 Equity Incentive Plan	553,105	$4.03	27,835
2014 Equity Incentive Plan	661,581	$5.69	425,462
Equity compensation plans not approved by security holders	—	—	—
Total	1,214,686	$4.93	453,297

Subsequent to year-end, we issued Anil Goyal, Melissa Price, Taylor Schreiber and Jeff Wolf options exercisable for 21,587, 51,587, 57,567 and 94,048 shares of common stock, respectively pro rata on a monthly basis over four years as part of their 2015 bonus.

Holders

As of March 7, 2016, we had 8,424,641 shares of common stock outstanding held by approximately 30 holders of record.

MANAGEMENT AND BOARD OF DIRECTORS

Board of Directors

Our business and affairs are organized under the direction of our board of directors, or our Board, which currently consists of six members. The primary responsibilities of our board are to provide oversight, strategic guidance, counseling and direction to our management. Our Board meets on a regular basis and additionally as necessary.

Executive Officers and Board of Directors

DIRECTORS, EXECUTIVE OFFICERS, AND CORPORATE GOVERNANCE

Directors, Executive Officers and Corporate Governance

Below is certain information regarding our directors and executive officers.

Name	Age	Position	Served as an Officer or Director Since
Jeffrey Wolf	52	Chairman, Chief Executive Officer and Director	2008
Timothy Creech	55	Chief Financial Officer	2015
Anil K. Goyal Ph.D.	51	Vice President of Business Development	2013
Melissa Price Ph.D.	42	Vice President of Product Development	2013
Taylor Schreiber	36	Chief Scientific Officer	2014
John Monahan, Ph.D.	69	Director	2009
Paul Belsky, MD	59	Director	2009
Michael Kharitonov, Ph.D.	52	Director	2009
Edward B. Smith	40	Director	2009
Louis C. Bock	50	Director	2013

Jeffrey Wolf, *Chairman and Chief Executive Officer*

Mr. Wolf founded Heat Biologics in August, 2008. Mr. Wolf served from June 1997 to March 2011 as managing director at Seed-One Ventures, LLC a venture firm focused on launching and growing exceptional healthcare companies from the ground up. Since founding Seed-One, Mr. Wolf has founded and run several biomedical companies. Mr. Wolf's start-ups include Avigen, a gene therapy company where he was a co-founder and director; TyRx Pharma, a company focused on the development of bio-compatible polymers where he was a co-founder and Chairman; EluSys Therapeutics, a company focused on the development of a novel technology to remove blood-borne pathogens where he was a co-founder, Chairman and Chief Executive Officer; and GenerationOne, a company focused on mobile-based collaborative care, where he was the founder, Chairman and Chief Executive Officer. Mr. Wolf received his M.B.A. from Stanford Business School, his J.D. from New York University School of Law and his B.A. from the University of Chicago, where he graduated with honors in Economics. Mr. Wolf serves as a director of several Seed-One portfolio companies and serves as a director of Synthetic Biologics, Inc., a biotechnology company focused on the development of novel anti-infective biologic and drug candidates targeting specific pathogens that cause serious infections and other diseases.

We selected Mr. Wolf to serve on our Board as our chairman because he brings to the board extensive knowledge of the pharmaceutical and biotechnology industries. Having served in senior corporate positions in several biomedical companies, he has a vast knowledge of the industry and brings to the board significant executive leadership and operational experience. His business experience provides him with a broad understanding of the operational, financial and strategic issues facing public companies and his service on other public company boards provides him with extensive corporate governance knowledge.

Timothy Creech, ***Chief Financial Officer***

Mr. Creech joined Heat Biologics in November 2015 as Chief Financial Officer. Prior to joining Heat, Mr. Creech served as Acting Chief Financial Officer of Salix Pharmaceutical, Inc., a publicly-held specialty pharmaceutical company acquired by Valeant for $11 billion in April 2015. Before his appointment as Acting Chief Financial Officer for Salix, Mr. Creech held several financial leadership positions at Salix over the last seven years including Senior Vice President, Finance and Administrative Services. Before joining Salix in 2007, Mr. Creech served as Vice President of Finance and Chief Accounting Officer at Voyager Pharmaceutical Corporation, a privately held biotechnology company. Mr. Creech also previously spent seven years at Trimeris, Inc., a publicly-listed biotechnology company engaged in the discovery and development of novel therapeutic agents, serving in the role of Vice President of Finance, and Principal Accounting Officer and Secretary.

Mr. Creech is a certified public accountant (CPA). He received a MBA from the Fuqua School of Business at Duke University and a B.S. in business administration and accounting from the University of North Carolina at Chapel Hill.

Anil Goyal, Ph.D., ***Vice President of Business Development***

Dr. Goyal joined Heat Biologics in December 2013 as Vice President of Business Development of the Company. Prior to joining Heat Biologics,Dr. Goyal served as President and Chief Executive Officer of Qualiber, Inc., a company which he co-founded, from April 2010 until December 2013 and Managing Director of OpenDoors Group, LLC, a company he founded, from August 2008 until December 2013. From January 2009 until January 2010, Dr. Goyal served as the Vice President of Business Development at Optherion, Inc. and from January 2003 until January 2008 he served as Vice President of Business Development of Serenex, Inc., an oncology company that was acquired by Pfizer. Prior thereto, he served in various key management and development positions at Millennium Pharmaceuticals, Genome Therapeutics Corporation and Merck & Co.

Melissa Price, Ph.D., ***Vice President of Product Development***

Dr. Price is responsible for coordinating the clinical development and operational efforts at Heat Biologics. Prior to joining Heat Biologics, Inc.,Dr. Price served in various positions at INC Research including Vice President of Global FSP Solutions at INC Research from February 2012 until October 2013 and Executive Director, Strategic Alliance Management from January 2010 until February 2012. From June 2009 until January 2010, Dr. Price served as the Senior Director, Drug Development Partnerships at Novaquest, a Quintiles Company. Prior thereto, from 2006 until 2009 she served in various positions at INC Research and Attenuon. Dr. Price received her Ph.D. in Organic Chemistry from Yale University.

Taylor H. Schreiber, M.D., Ph.D., ***Chief Scientific Officer***

Dr. Schreiber joined Heat Biologics in March 2014 initially as Vice President of Research and Development and in July 2015 was appointed Chief Scientific Officer, leading Heat's preclinical drug development and scientific operations. As a cancer biologist and drug development scientist, Dr. Schreiber possesses over 15 years of laboratory experience in the discovery of novel therapeutic immuno-oncology compounds. He is the co-inventor of significant elements of Heat's *ImPACT*™ and *ComPACT*™ immunotherapy platforms as well as a co-inventor of TNFRSF25 agonist technologies. Dr. Schreiber received his Ph.D. from the Sheila and David Fuente Program in cancer biology as well as his M.D. at the University of Miami Miller School of Medicine. In addition, he completed his post-doctoral fellowship with the original inventor of Heat's *ImPACT*™ technology platform, Eckhard R. Podack, M.D., Ph.D., studying the immunobiology of TNFRSF25. Dr. Schreiber has authored over 25 peer-reviewed tumor immunology and heat shock protein-based cancer immunotherapy publications. In 2011, he was nominated as a Future Leader in Cancer Research by the American Association for Cancer Research.

Paul Belsky, M.D., *Director*

Dr. Belsky has served on our Board since November 2009. Dr. Belsky has been a partner at Concorde Medical Group, LLC since June of 1998. Dr. Belsky served as a scientific advisor to Seed-One Ventures, Elusys Therapeutics, Sensatex, GenerationOne and TyRx Pharma. Dr. Belsky has extensive expertise in the clinical practice of internal medicine and cardiovascular diseases, and was formerly on the clinical academic faculty at Weill College of Medicine, Cornell University. He is a fellow of the American College of Cardiology and the American College of Chest Physicians, is a member of the American College of Physicians, and a Clinical Assistant Professor of Medicine at New York University School of Medicine. Dr. Belsky received his M.D. from the University of California at San Francisco, and his AB in Biology from Brown University, where he was elected Phi Beta Kappa.

We selected Dr. Belsky to serve on our Board because he brings to the board extensive knowledge of the medical industry. His medical background aids in the understanding of the detailed science behind our intellectual property.

Louis C Bock, *Director*

Louis C. Bock was a Managing Director of Scale Venture Partners, a venture capital firm, until June 2014. Mr. Bock joined Scale Venture Partners in September 1997 from Gilead Sciences, Inc., a biopharmaceutical company where he worked from September 1989 to September 1997. Prior to Gilead, he was a research associate at Genentech, Inc. from November 1987 to September 1989. He currently serves as a director of the following publicly traded companies: Orexigen Therapeutics, Inc., for which he also serves as a member of the Audit and Nominating and Governance committees, and Zogenix, Inc., for which he also serves as a member of the Audit, Compensation and Nominating and Governance committees. In addition, Mr. Bock serves on the board of directors of the following privately-held companies: Molecular Templates, CardioKinetix and Powervision and also serves on the board of directors of Arizona Technology Enterprises, LLC, a non-profit organization. Mr. Bock is responsible for Scale Venture Partners' investment in Seattle Genetics, Inc. In the past five years, Mr. Bock has also served as a member of the boards of directors of the following publicly traded companies: diaDexus Inc and Horizon Pharma, Inc. Mr. Bock received his B.S. in Biology from California State University, Chico and an M.B.A. from California State University, San Francisco.

We selected Mr. Bock to serve on our Board because of his extensive clinical and leadership experience in the biotechnology and biopharmaceuticals industries, including experience in research, project management, business development and sales from his time at Gilead. His membership on other companies' boards of directors, including positions on other audit and nominating/corporate governance committees provides him with extensive corporate governance knowledge and insight into issues faced by companies similar to ours.

Michael Kharitonov, Ph.D., *Director*

Dr. Kharitonov is a high technology entrepreneur and computer scientist whose areas of expertise include advanced computer and communication technologies and quantitative finance. Dr. Kharitonov is a founder and CEO of Voleon Capital Management LP, an investment management firm. Dr. Kharitonov was a co-founder and former Chairman and CEO of Netli Inc., a successful Silicon Valley startup that pioneered the development of Application Delivery Networks. Under Dr. Kharitonov's leadership Netli raised over $20 million in venture financing from a number of Silicon Valley's best known venture capital firms. In 2007 Netli was acquired by Akamai Technologies (NASDAQ: AKAM). Dr. Kharitonov also served as a Vice President of D. E. Shaw and Co., an investment firm known as one of the most quantitatively advanced and computerized securities trading firms in the world. Dr. Kharitonov holds a Ph.D. degree from the Department of Computer Science at Stanford University. At Stanford he was awarded a Hertz Fellowship and was a winner of several scholarly awards. He also holds a B.A. in Computer Science and Mathematics with highest honors from University of California at Berkeley.

We selected Dr. Kharitonov to serve on our Board because he brings a strong start-up and finance background to the Company, and adds significant strategic, business and financial experience. His prior successful management experience and fundraisings provides him with a broad understanding issues faced by growing companies and of the financial markets and the financing opportunities available to us.

John Monahan, Ph.D., *Director*

Dr. Monahan is currently a consultant to Synthetic Biologics, Inc., a clinical stage company developing therapeutics to protect the gut microbiome while targeting pathogen-specific diseases focused on the development of synthetic DNA-based therapeutics and innovative disease-modifying medicines for serious illnesses. Dr. Monahan Co-Founded Avigen Inc. (NASDAQ:AVGN) in 1992, a company which has become a leader in its sector for the development of novel pharmaceutical products for the treatment of serious human diseases. Over a 12 year period as CEO of Avigen he raised over $235M in several private and public financings including its IPO. From 1989-1992, he was VP of R&D at Somatix Therapy Corp., Alameda, CA and from 1985-1989 he was Director of Molecular & Cell Biology at Triton Biosciences Inc., Alameda, CA. Prior to that from 1982-1985, he was Research Group Chief, Department of Molecular Genetics, Hoffmann-LaRoche, Inc. Nutley, NJ, and from 1975 to 1977 he was an Instructor at Baylor College of Medicine, Houston TX. He received his Ph.D. in Biochemistry in 1974 from McMaster University, Canada and his B.Sc. from University College Dublin, Ireland in 1969. Dr. Monahan is a Scientific Advisory Board member of Agillis Biotherapeutics. Dr. Monahan is a board member of Tacere Therapeutics, CA. He is also a board member of a number of Irish biotech companies including Genable, Cellix, Luxcel and GK Technologies.

We selected Dr. Monahan to serve on our Board because he brings to the board extensive knowledge of the pharmaceutical and biologics industry. Having served in senior corporate positions in many medical companies he has a vast knowledge of the industry.

Edward B. Smith, *Director*

Since January 2015, Mr. Smith has been the Chief Executive Officer of Z Trim Holdings Inc. (“Z Trim”) (OTC:ZTHO), a manufacturer of environmentally friendly agricultural functional ingredients and has been a board member of Z Trim since 2009. Since January 1, 2015, Mr. Smith has also been Managing Member of Aristar Capital Management, LLC, a New York-based investment firm founded in 2015. From April 2005 through December 2014 Mr. Smith served as the Managing Partner of Brightline Capital Management, LLC (“BCM”), a New York-based investment firm founded in 2005. Prior to founding BCM, Mr. Smith worked at Gracie Capital from 2004-2005, GTCR Golder Rauner from 1999-2001 and Credit Suisse First Boston from 1997-1999. Mr. Smith holds a Bachelor of Arts in Social Studies from Harvard College and a Masters in Business Administration from Harvard Business School. He is currently a Director of Z Trim Holdings Inc. (OTC: ZTHO), a manufacturer of environmentally friendly agricultural functional ingredients.

We selected Mr. Smith to serve on our Board because he brings a strong business background to the Company, and adds significant strategic, business and financial experience. Mr. Smith’s business background provides him with a broad understanding of the issues facing us, the financial markets and the financing opportunities available to us. His service on other public company boards provides him with extensive corporate governance knowledge and insight into issues faced by companies similar to ours.

Board Composition and Election of Directors

Our board of directors consists of six members: Messrs. Belsky, Bock, Kharitonov, Monahan, Smith and Wolf. Our board of directors has undertaken a review of its composition and its committees and the independence of each director. Based upon information requested from and provided by each director concerning his background, employment and affiliations, including family relationships, our board of directors has determined that each of Messrs. Belsky, Bock, Kharitonov, Monahan and Smith is “independent” under the applicable rules of the SEC and NASDAQ and that Mr. Wolf is not “independent” as defined under the such rules. In making such determination, our board of directors considered the relationship that each such non-employee director has with our company and all other facts and circumstances that our board of directors deemed relevant in determining his independence, including the beneficial ownership of our capital stock by each non-employee director. Mr. Wolf is not an independent director under these rules because he is our President and Chief Executive Officer.

Committees of the Board of Directors

The Board of Directors has a standing Audit Committee, Compensation Committee and Nominating and Governance Committee. The following table shows the directors who are currently members or Chairman of each of these committees.

Board Members	Audit Committee	Compensation Committee	Nominating and Governance Committee
Jeff Wolf	–	–	–
Paul Belsky	–	Member	Member
Louis Bock	Chairman	–	–
John Monahan	Member	Chairman	–
Edward Smith	Member	–	Chairman
Michael Kharitonov	–	Member	Member

Audit Committee

Dr. Monahan, Mr. Smith, and Mr. Bock currently serve as members of the Audit Committee. The Board has determined that Mr. Bock, Mr. Smith and Dr. Monahan are each "independent" in accordance with the NASDAQ definition of independence and each is a "financial expert", as defined by the SEC regulations, and each has the related financial management expertise within the meaning of the NASDAQ rules.

The primary purpose of the Audit Committee is to act on behalf of the Board of Directors in its oversight of all material aspects of our accounting and financial reporting processes, internal controls and audit functions, including our compliance with Section 404 of the Sarbanes-Oxley Act of 2002. Pursuant to its charter, our Audit Committee reviews on an on-going basis for potential conflicts of interest, and approves if appropriate, all our "Related Party Transactions." For purposes of the Audit Committee Charter, "Related Party Transactions" shall mean those transactions required to be disclosed pursuant to SEC Regulation S-K, Item 404. In addition, the Audit Committee reviews, acts on and reports to the Board of Directors with respect to various auditing and accounting matters, including the selection of the Company's independent registered public accounting firm, the scope of the annual audits, fees to be paid to the independent registered public accounting firm, the performance of the Company's independent registered public accounting firm and the accounting practices of the Company and the Company's internal controls and legal compliance functions. The Committee also reviews, prior to publication, our quarterly earnings releases and our reports to the Securities and Exchange Commission on Forms 10-K and 10-Q. The formal report of the Audit Committee for fiscal year 2014 is set forth below under Proposal 2 under the caption "Audit Committee Report." The Audit Committee operates pursuant to a written charter adopted by the Board of Directors, which is available on the Company's website at *www.heatbio.com*. The charter describes the nature and scope of responsibilities of the Audit Committee.

Compensation Committee

Our Compensation Committee is comprised of Dr. Belsky, Dr. Kharitonov and Dr. Monahan, each of whom is deemed to be independent in accordance with the NASDAQ definition of independence. This Committee determines, approves, and reports to the Board of Directors on all elements of compensation of our executive officers. The Compensation Committee also has the power to prescribe, amend, and rescind rules relating to our stock incentive plans, to recommend the grant of options and other awards under the stock incentive plans, and to interpret the stock incentive plans.

The Compensation Committee operates under a formal charter that governs its duties and standards of performance. A copy of the charter is available on our website at *www.heatbio.com*.

Our Compensation Committee annually reviews the compensation program for our Chief Executive Officer and other members of senior management and then makes recommendations to the full board for determination. In each case, the Committee takes into account the results achieved by the executive, his or her future potential, and his or her scope of responsibilities and experience. During our fiscal year ended December 31, 2014, the committee evaluated the performance of our executives and considered the compensation levels and equity programs at comparable companies and related industries and the analysis of its outside consultant before it made its compensation recommendations to the full board, including recommendations regarding salary increases, awards of cash bonuses and awards of stock options.

The Committee administers our stock plan, including review and recommendation of long-term incentive compensation for each executive, director and employee, including grants of stock options. The Committee believes that this long-term incentive compensation aligns the interests of our executives with those of our stockholders and furthers executive retention.

The Committee also reviews and recommends to the Board of Directors appropriate director compensation programs for service as directors, committee chairs and committee members.

Nominating and Corporate Governance Committee

The Nominating and Governance Committee is comprised of Dr. Belsky, Dr. Kharitonov and Mr. Smith.

The functions performed by the Nominating and Governance Committee include:

- recommending to the Board of Directors, individuals for appointment or election as directors;
- recommending to the Board of Directors individuals for appointment to vacancies on any committee of the Board of Directors;
- recommending to the Board of Directors regarding any changes to the size of the Board of Directors or any committee;
- reporting to the Board of Directors on a regular basis; and
- performing any other duties or responsibilities expressly delegated to the committee by the Board of Directors relating to board or committee members.

The Nominating and Governance Committee operates under a formal charter that governs its duties and standards of performance. A copy of the charter is available on our website at *www.heatbio.com*.

Risk Oversight

The Board has an active role, as a whole and also at the committee level, in overseeing management of the Company's risks. The Board regularly reviews information regarding the Company's strategy, finances and operations, as well as the risks associated with each. The Audit Committee is responsible for oversight of Company risks relating to accounting matters, financial reporting, internal controls and legal and regulatory compliance. The Audit Committee undertakes, at least annually, a review to evaluate these risks. The members then meet separately with management responsible for such area, including the Company's Chief Financial Officer, and report to the Audit Committee on any matters identified during such discussions with management. In addition, the Compensation Committee considers risks related to the attraction and retention of talent as well as risks relating to the design of compensation programs and arrangements. In addition, the Nominating and Governance Committee manages risks associated with the independence of the Board. While each committee is responsible for evaluating certain risks and overseeing the management of such risks, the entire Board is regularly informed through committee reports about such risks. The full Board considers strategic risks and opportunities and regularly receives detailed reports from the committees regarding risk oversight in their respective areas of responsibility.

Code of Conduct

The Board of Directors has adopted a Code of Conduct that applies to the Company's directors, executives (including its Chief Executive Officer and Chief Financial Officer) and employees. The Code is posted on the Company's website at *www.heatbio.com*.

Our Chief Executive Officer also serves as our Chairman of the Board. Our Board does not have a lead independent director. Our board of directors has determined its leadership structure was appropriate and effective for us given our stage of development.

2015 Director Compensation

Compensation of Directors

The following table sets forth information for the fiscal year ended December 31, 2015 regarding the compensation of our directors who at December 31, 2015 were not also named executive officers.

Name	Fees Earned or Paid in Cash	Option Awards	Other Compensation	Total
Paul Belsky, MD	$ 43,750	$ —	$ —	$ 43,750
Louis Bock	$ 40,000	$ —	$ —	$ 40,000
Michael Kharitonov, Ph.D.	$ 46,250	$ —	$ —	$ 46,250
John Monahan, Ph.D.	$ 46,250	$ —	$ —	$ 46,250
Edward Smith	$ 43,750	$ —	$ —	$ 43,750

As of December 31, 2015, the following table sets forth the number of aggregate outstanding option awards held by each of our directors who were not also named executive officers:

Name	Aggregate Number of Option Awards
Paul Belsky, MD	33,441
Louis Bock	28,223
Michael Kharitonov, Ph.D.	41,050
John Monahan, Ph.D.	41,050
Edward Smith	33,441

Our Compensation Committee conducted an evaluation of the compensation of the members of our board of directors. In order to aid its decision- making, the Compensation Committee considered the compensation practices and the competitive market for directors at companies with which we compete for personnel and an independent compensation advisor was retained to conduct a study of our peer group compensation. Based substantially upon the results of the study, commencing January 2016, directors who are not employees receive an annual cash fee of $35,000 as well as a cash fee of $8,000 for service on the Audit Committee and 5,000 for service on each of the Compensation and Nominating Committees. In addition, the Chairman of each of the Audit, Compensation and Nominating Committees will each receive an additional $12,500, $8,500 and $7,000, respectively. In addition, on January 11, 2016, each director who is not an employee was granted an option exercisable for shares of common stock (having a value of $45,000) vesting on the one year anniversary of the date of grant. Each nonemployee director also received an option grant on the date of the 2014 Annual Meeting of Stockholders having a value of $25,000 on such date, which for 2014 resulted in the issuance of options exercisable for 6,483 shares of common stock to each non-employee director. During 2014 and 2015, directors who were not employees received an annual cash fee of $25,000 as well as a cash fee of $5,000 for each committee on which they serve and the Chairman of the Audit and Compensation Committees receive an additional $2,000. Upon election to the Board, each non-employee director receives a grant of stock options exercisable for 21,740 shares of common stock vesting over four years having an exercise price equal to the fair market value of the common stock on the date of the grant. Each nonemployee director also received an option grant on the date of the 2014 Annual Meeting of Stockholders having a value of $25,000 on such date, which for 2014 resulted in the issuance of options exercisable for 6,483 shares of common stock to each non-employee director.

EXECUTIVE COMPENSATION

Set forth below is the compensation paid or accrued to our executive officers during the years ended December 31, 2015 and December 31, 2014 that exceeded $100,000.

Summary Compensation Table

Name and Principal Position	Year	Salary	Bonus	Options (9)	Other (1)	Total
Jeffrey Wolf	2015	$395,000	$177,750(2)	$47,513	—	$620,263
Chairman and CEO	2014	$381,893	$127,500(3)	$346,600	$12,108	$868,101
Timothy Creech	2015	$24,542(4)	—	$144,627	—	$169,169
Chief Financial Officer	2014	—	—	—	—	—
Steve DiPalma	2015	$13,798	—	—	—	$13,798
Interim Chief Financial Officer (5)	2014	—	—	—	—	—
Matt Czajkowski	2015	$82,500	—	—	—	$82,500
Former Chief Financial Officer (6)	2014	$162,500	$40,500(3)	$73,300	—	$276,300
Anil Goyal	2015	$255,000	$51,000(2)	$47,513	—	$353,513
Vice President of Business Development	2014	$219,975	$49,500(3)	$257,880	—	$527,355
Melissa Price	2015	$250,000	$75,000(2)	—	—	$325,000
Vice President of Product Development (7)	2014	$210,000	$47,250(3)	$43,870	—	$301,120
Taylor Schreiber	2015	$272,005	$95,202(2)	$187,390	—	$554,597
Chief Scientific Officer(8)	2014	$174,411	$39,483(3)	$191,300	$2,567	$407,761

(1) Represents payment for health insurance.
(2) This bonus was accrued in 2015 and paid in 2016.
(3) This bonus was accrued in 2014 and paid in 2015.
(4) Mr. Creech commenced employment on November 30, 2015, Mr. Creech's annual salary is $285,000 and he is entitled to devote up to twenty percent (20%) of his professional time on other non-competitive efforts.
(5) Mr. DiPalma served on a part time basis as our Chief Financial Officer until the appointment of Mr. Creech effective November 30, 2015.
(6) Mr. Czajkowski resigned as our Chief Financial Officer effective March 15, 2015, includes $45,000 severance.
(7) On July 23, 2015, Dr. Price was appointed our Vice President of Product Development.
(8) On July 23, 2015, Dr. Schreiber was appointed our Chief Scientific Officer.
(9) For all stock options, the values reflect the aggregate grant date fair value computed in accordance with FASB ASC 718. Assumptions made in the calculation of these amounts are described in Note 9 to the Company's audited financial statements for the years ended December 31, 2015 and 2014.

Outstanding Equity Awards at Fiscal Year-End (December 31, 2015)

Name and Principal Position	Number of securities underlying unexercised options/ exercisable	Number of securities underlying unexercised options/ unexercisable	Option exercise price	Option expiration date
Jeffrey Wolf	10,965(1)	—	$2.30	12/18/2019
Chairman and CEO	108,696(1)	—	$0.71	4/7/2021
	50,000(2)	50,000	$8.62	6/11/2024
	3,125(3)	9,375	$4.53	1/12/2025
Timothy Creech	2,916	67,084	$3.10	11/30/2025
Chief Financial Officer(4)				
Matt Czajkowski	23,441	—	$8.81	5/15/2023
Former Chief Financial Officer(5)	2,708	—	$8.62	1/17/2024
Anil Goyal	20,000(6)	20,000(6)	$7.58	12/16/2023
Vice President of Business Development	3,125(7)	9,375(7)	$4.53	1/12/2025
Melissa Price	28,125(8)	21,875(8)	$12.57	10/1/2023
Vice President of Product Development	2,916(9)	7,084(9)	$5.30	10/15/2024
Taylor Schreiber	22,914(10)	27,086(10)	$4.57	6/11/2024
Chief Scientific Officer	2,500(11)	7,500(11)	$4.53	1/12/2025
	3,645(12)	31,355(12)	$6.03	7/22/2025

(1) All shares are fully vested as of December 31, 2013.
(2) Issued on June 11, 2014, these options are fully vested as of January 2016.
(3) Issued on January 12, 2015 these options vest over a four year period and will be fully vested in December 2018.
(4) On November 30, 2015, Mr. Creech was appointed our Chief Financial Officer and was issued these options which vest over a 48 month period and will be fully vested in October 2019.
(5) Mr. Czajkowski resigned as our Chief Financial Officer effective March 15, 2015. Mr. Czajkowski has 23,441 vested options which are exercisable up to the ten year anniversary date of grant, May 15, 2023 and 2,708 vested options which are exercisable up to the ten year anniversary of the date of grant, January 17, 2024.
(6) Issued on December 16, 2013, these shares vest over a 48 month period and will be fully vested in December 2017.
(7) Issued on January 12, 2015 these options vest over a four year period and will be fully vested in December 2018.
(8) Issued on October 1, 2013, these shares vest over a 48 month period and will be fully vested in September 2017.
(9) Issued on October 15, 2014, these shares vest over a 48 month period and will be fully vested in October 2018.
(10) Issued on June 11, 2014, these shares vest over a 46 month period and will be fully vested in February 2018.
(11) Issued on January 12, 2015 these options vest over a four year period and will be fully vested in December 2018.
(12) Issued on July 23, 2015, these options vest over a four year period and will be fully vested in July 2019.

The chart above does not include the grant of options exercisable for 94,048, 57,567, 51,587 and 21,587 shares of common stock issued to each of Mr. Wolf, Dr. Schreiber, Dr. Price and Dr. Goyal, respectively, in January 2016.

Employment Agreements

On December 18, 2009, we entered into an employment agreement with Jeffrey Wolf to act as our Chief Executive Officer, which was amended on November 22, 2011, and further amended on each of January 20, 2014 and January 11, 2016. Mr. Wolf receives an annual base salary of $405,000 per year. He also may receive, at the sole discretion of the board, an additional cash performance-based bonus equal to up to 50% of his then outstanding base salary at the end of each year and a discretionary equity award, with the actual amount of his bonus to be increased or decreased in the sole discretion of the Board of Directors. Upon execution of the agreement, Mr. Wolf was issued options exercisable for 119,661 shares of our common stock. In addition, he is to receive certain options to purchase 2% of our fully diluted equity at an exercise price equal to the then current market price if our stock is traded on a nationally recognized exchange or NASDAQ and our market capitalization is at least $250 million for at least 5 days. If Mr. Wolf's employment contract is terminated for death or disability (as defined in the agreement), he (or his estate in the event of death) will receive six month's severance. If Mr. Wolf's employment is terminated by us other than for cause, he will receive 12 month's severance. In addition, if Mr. Wolf's employment is terminated by us other than for cause all Restricted Shares, common stock and options to purchase common stock that would have vested shall immediately vest. Mr. Wolf will not be entitled to any additional severance in the event he is terminated for cause or voluntarily resigns. Under his employment agreement, Mr. Wolf has also agreed to non-competition provisions.

Effective November 30, 2015, we appointed Timothy Creech as our Chief Financial Officer. In connection with his appointment, Mr. Creech entered into a four-year employment agreement with us (the "Creech Employment Agreement"), which was amended on January 11, 2016. Pursuant to the Creech Employment Agreement, Mr. Creech receives an annual base salary of $285,000 and will be eligible for a discretionary cash performance bonus payment of thirty-five percent (35%) of his base salary and a discretionary equity award with the actual amount of his bonus to be increased or decreased in the sole discretion of the Board of Directors. Additionally, Mr. Creech was granted an option to purchase 70,000 shares of our common stock with an exercise price equal to the Company's per share market price on the date of issue. These options vest pro rata, on a monthly basis, over forty-eight months. The Creech Employment Agreement also includes confidentiality obligations and inventions assignments by Mr. Creech. If Mr. Creech's employment is terminated for any reason, he or his estate as the case may be, will be entitled to receive the accrued base salary, vacation pay, expense reimbursement and any other entitlements accrued by him to the extent not previously paid (the "Accrued Obligations"); provided, however, that if his employment is terminated (1) by us without Just Cause (as defined in the Creech Employment Agreement) or (2) by Mr. Creech for Good Reason (as defined in the Creech Employment Agreement) then in addition to paying the Accrued Obligations: (x) we shall continue to pay his then current base salary for a period of six months; (y) he shall receive a pro-rated amount of the annual bonus which he would have received during the year without the occurrence of such termination at 100% of the targeted amount. If there is a Change of Control (as defined in our Amended and Restated 2014 Stock Incentive Plan) during the term of the Employment Agreement and at such time Mr. Creech has been employed by us for (i) less than five (5) months then fifty percent (50%) of the options granted to Mr. Creech will immediately vest, (ii) at least five (5) months but less than ten (10) months, then seventy five percent (75%) of the option granted to Mr. Creech will immediately vest; or (iii) at least ten (10) months, then the entire option will immediately vest.

Effective March 3, 2014, we appointed Taylor Schreiber, M.D., Ph.D., as our Vice President of Research and Development and effective July 23, 2015, Dr. Schreiber was appointed our Chief Scientific Officer. In connection with his appointment, Dr. Schreiber entered into a four-year employment agreement with us, which was amended January 12, 2015 and further amended on July 23, 2015 and January 11, 2016. Pursuant to the employment agreement, Dr. Schreiber receives an annual base salary of $300,000 and will be eligible for discretionary cash performance bonus payment of thirty-five percent (35%) of his base salary and a discretionary equity award with the actual amount of his bonus to be increased or decreased in the sole discretion of the Board of Directors. Additionally, on June 11, 2014, the date that our stockholders approved our 2014 Stock Incentive Plan, we granted Dr. Schreiber an option to purchase 50,000 shares of our common stock with an exercise price equal to our per share market price on the date of issue ($4.57). These options will vest pro rata, on a monthly basis, over 48 months, with a certain percentage vesting immediately upon grant. Dr. Schreiber was also eligible to receive, on the one year anniversary of his employment, an option to purchase 10,000 additional shares of our common stock if certain milestones were attained and such option was issued on January 11, 2015. The employment agreement also includes confidentiality obligations and inventions assignments by Dr. Schreiber. If Dr. Schreiber's employment is terminated for any reason, he or his estate as the case may be, will be entitled to receive the Accrued Obligations accrued by him to the extent not previously paid (the "Accrued Obligations"); provided, however, that if his employment is terminated (1) by the Company without Just Cause (as defined in the Employment Agreement), or (2) by Dr. Schreiber for Good Reason (as defined in the Employment Agreement) then in addition to paying the Accrued Obligations, (x) the Company shall continue to pay his then current base salary for a period of four months; (y) he shall receive a pro-rated amount of the annual bonus which he would have received during the year without the occurrence of such termination and (z) he will have the right to exercise any vested options until the earlier of the expiration of the severance or the expiration of the term of the option.

Effective December 16, 2013, we appointed Anil K. Goyal, Ph.D. as our Vice President of Business Development. In connection with his appointment, Dr. Goyal entered into a four-year employment agreement with us (the "Goyal Employment Agreement"), which was amended January 12, 2015 and further amended on January 11, 2016. Pursuant to the Goyal Employment Agreement, Dr. Goyal receives an annual base salary of $255,000 and will be eligible for a discretionary cash performance bonus payment of thirty percent (30%) of his base salary and a discretionary equity award with the actual amount of his bonus to be increased or decreased in the sole discretion of the Board of Directors. Additionally, Dr. Goyal was granted an option to purchase 40,000 shares of our common stock with an exercise price equal to the Company's per share market price on the date of issue. These options vest pro rata, on a monthly basis, over 48 months. Dr. Goyal was also eligible to receive, on the one year anniversary of his employment, an option to purchase 12,500 shares of our common stock if certain milestones were attained and such option was issued on January 12, 2015. The Goyal Employment Agreement also includes confidentiality obligations and inventions assignments by Dr. Goyal. If Dr. Goyal's employment is terminated for any reason, he or his estate as the case may be, will be entitled to receive the accrued base salary, vacation pay, expense reimbursement and any other entitlements accrued by him to the extent not previously paid (the "Accrued Obligations"); provided, however, that if his employment is terminated (1) by us without Just Cause (as defined in the Goyal Employment Agreement) or (2) by Dr. Goyal for Good Reason (as defined in the Goyal Employment Agreement) then in addition to paying the Accrued Obligations: (x) we shall continue to pay his then current base salary for a period of four months; (y) he shall receive a pro-rated amount of the annual bonus which he would have received during the year without the occurrence of such termination; and (z) he will have the right to exercise any vested options and any options that would have vested in the next four months until the earlier of the expiration of the severance or the expiration of the term of the option.

Effective October 1, 2013, we appointed Melissa Price, Ph.D. as our Vice President of Clinical and Regulatory Affairs. In connection with her appointment, Dr. Price entered into a four-year employment agreement with us (the "Price Employment Agreement"), which was amended on January 20, 2014 and further amended on January 12, 2015, July 23, 2015 and January 11, 2016. On July 23, 2015, Dr. Price was appointed our Vice President of Product Development. Pursuant to the Price Employment Agreement, Dr. Price receives an annual base salary of $250,000 and will be eligible for a discretionary cash performance bonus payment of thirty percent (30%) of her base salary and a discretionary equity award with the actual amount of her bonus to be increased or decreased in the sole discretion of the Board of Directors. Additionally, Dr. Price was granted an option to purchase 50,000 shares of our common stock with an exercise price equal to our per share market price on the date of issue. These options vest pro rata, on a monthly basis, over 48 months. Dr. Price was also eligible to receive an option to purchase 10,000 shares of our common stock if certain agreed to milestones were attained and such option was issued in October 2014. The Price Employment Agreement also includes confidentiality obligations and inventions assignments by Dr. Price. If Dr. Price's employment is terminated for any reason, she or her estate as the case may be, will be entitled to receive the Accrued Obligations accrued by her to the extent not previously paid; provided, however, that if her employment is terminated (1) by us without Just Cause (as defined in the Price Employment Agreement) or by Dr. Price for Good Reason (as defined in the Price Employment Agreement) then in addition to paying the Accrued Obligations, (x) we shall continue to pay her then current base salary for a period of four months; (y) she shall receive a pro-rated amount of the annual bonus which she would have received during the year without the occurrence of such termination and (z) she will have the right to exercise any vested options and any options that would have vested in the next four months until the earlier of the expiration of the severance or the expiration of the term of the option.

On March 9, 2015, we entered into a consulting agreement (the "Consulting Agreement") with Danforth Advisors, LLC ("Danforth") for finance, accounting and administrative functions, including interim chief financial officer services provided by Mr. Stephen J. DiPalma. We paid Danforth an agreed upon hourly rate for such services and reimbursed Danforth for expenses. The Consulting Agreement continued until December 31, 2015.

On May 15, 2013, we entered into an employment agreement with Matthew E. Czajkowski to act as our Chief Financial Officer, which was amended on January 20, 2014 and further amended on May 1, 2014. Mr. Czajkowski received an annual base salary of $180,000 per year for his provision of services to us for 80% of his professional time. In addition, Mr. Czajkowski was eligible to receive, at the sole discretion of the board, additional performance-based bonuses equal to up to 50% of this then outstanding base salary at the end of each year. Mr. Czajkowski's employment contract provided for three month's severance pay upon termination not for cause (as defined in the agreement) and accelerated vesting of all options that would have vested within one year of such termination. The agreement also provided for payments in the event of death and disability. On March 9, 2015, we entered into a severance agreement with Mr. Czajkowski effective as of March 15, 2015. In accordance with the terms of the severance agreement, Mr. Czajkowski resigned as our Chief Financial Officer effective as of March 15, 2015, and we paid Mr. Czajkowski all accrued and unpaid base salary and an expense reimbursement in addition to $45,000. Mr. Czajkowski has the ability to exercise all stock options issued to him that vested prior to the date of resignation in accordance with the terms of his employment agreement at any time prior to the ten year anniversary of the date of grant and any unvested options at the time of resignation were immediately vested and are exercisable for 90 days after March 15, 2015. The severance agreement also contained additional provisions that are customary for agreements of this type, including confidentiality, non-competition and non-solicitation provisions.

SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT

The following table sets forth information, as of January 15, 2016, or as otherwise set forth below, with respect to the beneficial ownership of our common stock (i) all persons know to us to be the beneficial owners of more than 5% of the outstanding shares of our common stock, (ii) each of our directors and our executive officer named in the Summary Compensation Table, and (iii) all of our directors and our executive officer as a group. As of January 15, 2016 we had 8,424,641 shares of common stock outstanding.

Unless otherwise indicated the mailing address of each of the stockholders below is c/o Heat Biologics, Inc., 801 Capitola Drive, Bay 12, Durham, North Carolina 27713. Except as otherwise indicated, and subject to applicable community property laws, except to the extent authority is shared by both spouses under applicable law, the Company believes the persons named in the table have sole voting and investment power with respect to all shares of common stock held by them.

Name of Beneficial Owner	Common Stock	Shares subject to Options (1)	Total Number of Shares Beneficially Owned	Percentage Ownership
Executive Officers & Directors				
Paul Belsky, M.D. (Director)	47,190	33,441	80,631	1.0%
Louis Bock (Director)	—	20,068	20,068	*
Timothy Creech (Chief Financial Officer)	—	5,834	5,834	*
Anil Goyal, Ph.D. (Vice President of Business Development)	—	26,920	26,920	*
Michael Kharitonov, Ph.D. (Director)(2)	49,960	41,050	91,010	1.1%
John Monahan, Ph.D. (Director)	1,211	41,050	42,261	*
Melissa Price, Ph.D. Vice President of Product Development (3)	692	37,807	38,499	*
Taylor Schreiber, M.D., PhD Chief Scientific Officer(4)	39,132	36,824	75,956	*
Edward Smith (Director)(5)	697,303	33,441	730,744	8.6%
Jeffrey Wolf (Director, CEO, Treasurer & Secretary)(6)	1,237,396	229,184	1,466,580	16.9%
Matthew Czajkowski (Former Chief Financial Officer)	—	26,149	26,149	*
Stephen DiPalma (Former Chief Financial Officer)	—	—	—	
All Executive Officers & Directors, as a group (11 persons)	2,072,884	531,768	2,604,652	29.1%
5% Stockholders(1)				
Aristar Capital Management, LLC(5)			697,303	8.3%
Orion Holdings V, LLC (6)			695,653	8.3%
Seed-One Holdings VI, LLC(6)			536,862	6.4%
FW Heat Biologics, LLC(7)			453,673	5.4%
Franklin Resources, Inc. (8)			1,433,300	17.0%

*less than 1%

(1) Represents shares subject to options which are vested and exercisable within 60 days of January 15, 2016.

(2) Includes 49,960 shares of common stock held by Dr. Kharitonov. Dr. Kharitonov disclaims beneficial ownership of these shares except to the extent of any pecuniary interest (as defined in Rule 16a–1(a)(2) promulgated under the Exchange Act) that he may have in the Sunrise Equity, LLC.

(3) The 692 shares of common stock are held in custodial accounts in the names of Dr. Price's children, of which Dr. Price disclaims beneficial ownership except to the extent of any pecuniary interest (as defined in Rule 16a–1(a)(2) promulgated under the Exchange Act) that she may have.

(4) Dr. Schreiber and an entity controlled by Dr. Schreiber have been issued an aggregate of 39,132 shares of common stock that are included in the number of shares beneficially owned by Dr. Schreiber.

(5) Information obtained from a Schedule 13D/A filed on January 8, 2015 with the Securities and Exchange Commission filed on behalf of Aristar Capital Management, LLC of which Mr. Smith disclaims beneficial ownership of 697,303 shares of common stock, except to the extent of any pecuniary interest (as defined in Rule 16a–1(a)(2) promulgated under the Exchange Act) that he may have in such entities.

(6) Includes 695,653 shares of common stock held by Orion Holdings V, LLC and 536,862 shares of common stock held by Seed-One Holdings VI, LLC, entities for which Mr. Wolf serves as the managing member. Mr. Wolf is deemed to beneficially own the shares held by such entities as in his role as the managing member he has the control over the voting and disposition of any shares held by these entities. Includes 3,660 shares purchased May 2014 and 1,221 shares converted from Series B, does not include 86,957 shares of common stock beneficially owned by Mr. Wolf's children's trust of which Mr. Wolf is not the trustee. Mr. Wolf disclaims beneficial ownership of these shares except to the extent of any pecuniary interest (as defined in Rule 16a–1(a)(2) promulgated under the Exchange Act) that he may have in such entities. In addition, if our Company is traded on a recognized national exchange or NASDAQ while Mr. Wolf is employed by us and the market capitalization of our Company is in excess of $250 million for at least five consecutive trading days, then Mr. Wolf will be entitled to receive an additional stock option equal to 2% of the then outstanding shares of our common stock, at an exercise price equal to the then current market price as determined in good faith by the board.

(7) Information obtained from a Schedule 13G filed February 12, 2014 with the Securities and Exchange Commission filed on behalf of (i) FW Heat Investors, L.P. (the "Fund"), a Delaware limited partnership, (ii) FW Heat Genpar, LLC (the "General Partner"), a Delaware limited liability company, as the general partner to the Fund, and (iii) Jay H. Hebert, as the sole member of the General Partner ("Hebert" and, together with the Fund and the General Partner, the "Reporting Persons"). All 453,763 shares of Common Stock are held by the Fund. The mailing address of FW Heat Investors L.P is 201 Main Street, Fort Worth, Texas 76102.

(8) Information obtained from a Schedule 13G/A filed with the Securities and Exchange Commission on April 10, 2015. Charles B. Johnson and Rupert H. Johnson, Jr. each own in excess of 10% of the outstanding common stock of Franklin Resources, Inc. ("FRI") and are the principal stockholders of FRI. Franklin Advisor, Inc. a management subsidiary of FRI is also deemed to be a beneficial owner of the common stock owned by FRI. The address of Franklin Resources, Inc. is One Franklin Parkway, San Mateo, California 94403-1906.

CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS; DIRECTOR INDEPENDENCE

Related-Party Transaction Policy

Pursuant to our charter, our Audit Committee shall review on an on-going basis for potential conflicts of interest, and approve if appropriate, all our "Related Party Transactions" as required by of NASDAQ Rule 4350(h). For purposes of the Audit Committee Charter, "Related Party Transactions" shall mean those transactions required to be disclosed pursuant to SEC Regulation S-K, Item 404.

The following is a summary of transactions since January 1, 2014 to which we have been a party in which the amount involved exceeded the lesser of $120,000 or one percent of the average of our total assets at the end of the most recently completed fiscal year and in which any of our executive officers, directors or beneficial holders of more than five percent of our capital stock had or will have a direct or indirect material interest, other than compensation arrangements which are described under the section entitled "Management—Non-Employee Director Compensation" and "Management—Executive Compensation."

On January 11, 2016, our named executive officers were awarded the following 2015 year-end bonus compensation: Jeffrey A. Wolf, our Chief Executive Officer, was granted options to purchase 94,048 shares of our common stock and received a cash bonus in the amount of $177,500; Dr. Goyal was granted options to purchase 21,587 shares of our common stock and received a cash bonus in the amount of $51,000; Dr. Price was granted options to purchase 51,587 shares of our common stock and received a cash bonus in the amount of $75,000; and Dr. Schreiber was granted options to purchase 57,567 shares of our common stock and received a cash bonus in the amount of $95,202. The stock options granted have an exercise price of $2.47 per share, which is the closing price of our common stock on the grant date (January 11, 2016), vest pro rata, on a monthly basis, over a four (4) year period and expire ten (10) years from the date of the grant, unless terminated earlier.

On January 11, 2016 our non-executive directors were granted options to purchase 23,810 shares of our common stock. The stock options granted have an exercise price of $2.47, which is the closing price of our common stock on the grant date (January 11, 2016), vest on January 11, 2017 and expire ten (10) years from the date of the grant, unless terminated earlier.

On July 23, 2015, we issued an additional 35,000 options to Dr. Schreiber vesting monthly on a pro rata basis over a four-year period.

On March 9, 2015, we entered into a severance agreement with Mr. Czajkowski effective as of March 15, 2015. In accordance with the terms of the severance agreement, Mr. Czajkowski resigned as our Chief Financial Officer effective as of March 15, 2015, and we paid Mr. Czajkowski all accrued and unpaid base salary and an expense reimbursement in addition to $45,000. Mr. Czajkowski has the ability to exercise all stock options issued to him that vested prior to the date of resignation in accordance with the terms of his employment agreement at any time prior to the ten-year anniversary of the date of grant and any unvested options at the time of resignation were immediately vested and are exercisable for 90 days after March 15, 2015. The severance agreement also contained additional provisions that are customary for agreements of this type, including confidentiality, non-competition and non-solicitation provisions.

On January 12, 2015, our named executive officers were awarded the following 2014 year-end bonus compensation: Jeffrey A. Wolf, our Chief Executive Officer, was granted options to purchase 12,500 shares of our common stock and received a cash bonus in the amount of $127,500; Dr. Goyal was granted options to purchase 12,500 shares of our common stock and received a cash bonus in the amount of $49,500; Dr. Price received a cash bonus in the amount of $47,250; and Dr. Schreiber was granted options to purchase 10,000 shares of our common stock and received a cash bonus in the amount of $39,483. The stock options granted have an exercise price of $4.53, which is the closing price of the Common Stock on the grant date (January 12, 2015), vest pro rata, on a monthly basis, over a four (4) year period and expire ten (10) years from the date of the grant, unless terminated earlier.

DESCRIPTION OF OUR SECURITIES

General

The following is a summary of the rights of our common stock and related provisions of our articles of incorporation and bylaws. For more detailed information, please see our articles of incorporation and bylaws.

We are authorized to issue 50,000,000 shares of common stock, par value $0.0002 per share, of which 8,424,641 shares are outstanding and 10,000,000 shares of Preferred Stock, par value $.0001 per share, of which 112,500 shares are designated Series 1 Preferred Stock, 2,000,000 shares are designated Series A Preferred Stock, 4,100,000 are designated as Series B-1 Preferred Stock and 2,000,000 are designated Series B-2 Preferred Stock. There are currently no shares of Preferred Stock outstanding.

Common Stock

The holders of our common stock are entitled to one vote per share on all matters to be voted on by the shareholders. Subject to preferences that may be applicable to any outstanding shares of Preferred Stock, holders of common stock are entitled to receive ratably such dividends as may be declared by the Board out of funds legally available therefore. If we liquidate, dissolve or wind up, holders of common stock are entitled to share ratably in all assets remaining after payment of liabilities and the liquidation preferences of any outstanding shares of Preferred Stock. Holders of common stock have no preemptive, conversion or subscription rights. There are no redemption or sinking fund provisions applicable to the common stock. All outstanding shares of common stock are, and all shares of common stock to be outstanding upon completion of this offering will be, fully paid and nonassessable. Except as otherwise required by Delaware law, all stockholder action, other than the election of directors, is taken by the vote of a majority of the outstanding shares of common stock voting as a single class present at a meeting of stockholders at which a quorum consisting of a majority of the outstanding shares of common stock is present in person or proxy. The election of directors by our stockholders, is determined by a plurality of the votes cast by the stockholders entitled to vote at any meeting held for such purposes at which a quorum consisting of a majority of the outstanding shares of common stock is present in person or proxy.

Reverse Stock Split

On May 29, 2013, we effected a 1-for-2.3 reverse stock split. Upon the effectiveness of the reverse stock split, every 2.3 shares of outstanding common stock decreased to one share of common stock. Similarly, the number of shares of common stock into which each outstanding option and warrant to purchase common stock is exercisable decreased on a 1-for-2.3 basis and the exercise price of each outstanding option and warrant to purchase common stock increased proportionately. In addition, the applicable conversion price of the Preferred Stock that was outstanding at such time was proportionately increased to adjust for the stock split resulting in a proportionate decrease in the number of shares that were issued upon conversion of the Preferred Stock upon the closing of our initial public offering.

Unless otherwise indicated, all references to share numbers in this prospectus filed as part of this registration statement reflect the effects of this reverse stock split.

Outstanding Common Stock Warrants

On March 10, 2011, we issued warrants to purchase 32,610 shares of common stock to non-employee placement agents in consideration for a private equity placement transaction, of which 17,392 remain outstanding. The warrants have an exercise price of $0.48 per share and expire 10 years from the issuance date.

In connection with our initial public offering, we issued warrants to the underwriters for 125,000 shares of common stock issuable at $12.50 per share upon exercise. The warrants have a five-year life and expire on July 23, 2018. In addition, the warrants provide for registration rights upon request, in certain cases. The holders of the warrants were granted demand registration rights for a period of five years from the effective date of the offering and piggyback registration rights for a period of seven years from the effective date of the offering The exercise price and number of shares issuable upon exercise of the warrants may be adjusted in certain circumstances including in the event of a stock dividend or our recapitalization, reorganization, merger or consolidation. However, the warrant exercise price or underlying shares will not be adjusted for issuances of shares of common stock at a price below the warrant exercise price.

Stock Option Plans

In January, 2014, the Board adopted, and on June 11, 2014 at our 2014 Annual Meeting of Stockholders our stockholders approved our 2014 Stock Incentive Plan (the "2014 Plan") under which we are authorized to grant 500,000 awards in the form of options, restricted stock, restricted stock units and other stock based awards. In 2009, our Board adopted and our stockholders approved our 2009 Stock Incentive Plan (the "2009 Plan") under which we are authorized to grant 869,565 awards in the form of options, restricted stock, restricted stock units and other stock based awards. As of December 31, 2015: (1) 858,892 awards had been granted under the 2014 Plan, of which 3,750 were exercised, and 183,959 were canceled and there were 425,462 shares of Common Stock available for grant under the 2014 Plan, and (2) 860,270 awards had been granted under the 2009 Plan, of which 188,719 were exercised, and 118,446 were canceled and there were 27,835 shares of Common Stock available for grant under the 2009 Plan.

In March 2015, our Compensation Committee recommended and our Board of Directors adopted and at the 2015 Annual Meeting of Stockholders, our stockholders approved an amendment to the 2014 Plan to increase by 600,000 shares the aggregate number of shares of our Common Stock that may be delivered pursuant to awards granted during the life of the 2014 Plan. As of July 2013, we had the authority to grant up to 1,100,000 awards under the 2014 Plan, as amended.

Potential Anti-Takeover Effects

Certain provisions set forth in our Third Amended and Restated Certificate of Incorporation, as amended, in our bylaws and in Delaware law, which are summarized below, may be deemed to have an anti-takeover effect and may delay, deter or prevent a tender offer or takeover attempt that a stockholder might consider to be in its best interests, including attempts that might result in a premium being paid over the market price for the shares held by stockholders.

Blank Check Preferred Stock. Our Certificate of Incorporation and bylaws contain provisions that permit us to issue, without any further vote or action by the stockholders, up to 10,000,000 shares of preferred stock in one or more series and, with respect to each such series, to fix the number of shares constituting the series and the designation of the series, the voting powers, if any, of the shares of the series, and the preferences and relative, participating, optional and other special rights, if any, and any qualifications, limitations or restrictions, of the shares of such series.

Special Meetings of Stockholders. Our bylaws provide that special meetings of stockholders may be called only by the chairman or by our board. Stockholders are not permitted to call a special meeting of stockholders, to require that the board call such a special meeting, or to require that our board request the calling of a special meeting of stockholders.

While the foregoing provisions of our certificate of incorporation, bylaws and Delaware law may have an anti-takeover effect, these provisions are intended to enhance the likelihood of continuity and stability in the composition of the Board of directors and in the policies formulated by the Board of directors and to discourage certain types of transactions that may involve an actual or threatened change of control. In that regard, these provisions are designed to reduce our vulnerability to an unsolicited acquisition proposal. The provisions also are intended to discourage certain tactics that may be used in proxy fights. However, such provisions could have the effect of discouraging others from making tender offers for our shares and, as a consequence, they also may inhibit fluctuations in the market price of our common stock that could result from actual or rumored takeover attempts. Such provisions also may have the effect of preventing changes in our management.

Delaware Takeover Statute

In general, Section 203 of the Delaware General Corporation Law prohibits a Delaware corporation that is a public company from engaging in any "business combination" (as defined below) with any "interested stockholder" (defined generally as an entity or person beneficially owning 15% or more of the outstanding voting stock of the corporation and any entity or person affiliated with such entity or person) for a period of three years following the date that such stockholder became an interested stockholder, unless: (1) prior to such date, the Board of directors of the corporation approved either the business combination or the transaction that resulted in the stockholder becoming an interested stockholder; (2) on consummation of the transaction that resulted in the stockholder becoming an interested stockholder, the interested stockholder owned at least 85% of the voting stock of the corporation outstanding at the time the transaction commenced, excluding for purposes of determining the number of shares outstanding those shares owned (x) by persons who are directors and also officers and (y) by employee stock plans in which employee participants do not have the right to determine confidentially whether shares held subject to the plan will be tendered in a tender or exchange offer; or (3) on or subsequent to such date, the business combination is approved by the Board of directors and authorized at an annual or special meeting of stockholders, and not by written consent, by the affirmative vote of at least two-thirds of the outstanding voting stock that is not owned by the interested stockholder.

Section 203 of the Delaware General Corporation Law defines "business combination" to include: (1) any merger or consolidation involving the corporation and the interested stockholder; (2) any sale, transfer, pledge or other disposition of ten percent or more of the assets of the corporation involving the interested stockholder; (3) subject to certain exceptions, any transaction that results in the issuance or transfer by the corporation of any stock of the corporation to the interested stockholder; (4) any transaction involving the corporation that has the effect of increasing the proportionate share of the stock of any class or series of the corporation beneficially owned by the interested stockholder; or (5) the receipt by the interested stockholder of the benefit of any loans, advances, guarantees, pledges or other financial benefits provided by or through the corporation.

Listing of Common Stock

Our common stock is currently listed on the NASDAQ Capital Market under the trading symbol "HTBX."

Transfer Agent

We have retained Continental Stock Transfer & Trust Company as our transfer agent. They are located at 17 Battery Place, 8th floor, New York, New York 10004. Their telephone number is (212) 509-4000.

DESCRIPTION OF SECURITIES WE ARE OFFERING

We are offering shares of our common stock and warrants to purchase shares of our common stock. Each share of our common stock is being sold together with of a warrant to purchase one share of common stock. The shares of our common stock and related warrants will be issued separately. We are also registering the shares of our common stock issuable from time to time upon exercise of the warrants offered hereby.

Common Stock

The material terms and provisions of our common stock and each other class of our securities which qualifies or limits our common stock are described under the caption "Description of Our Securities" in this prospectus.

Warrants

The following summary of certain terms and provisions of the warrants that are being offered hereby together with our common stock is not complete and is subject to, and qualified in its entirety by, the provisions of the warrant, the form of which has been filed as an exhibit to the registration statement of which this prospectus is a part. Prospective investors should carefully review the terms and provisions of the form of warrant for a complete description of the terms and conditions of the warrants.

Duration and Exercise Price

Each warrant offered hereby will have an exercise price of not less than 100% of the closing bid price of our common stock on the trading day immediately preceding the pricing of this offering. The warrants will be immediately exercisable and will expire on the fifth anniversary of the original issuance date. The warrants will be issued separately from our common stock, and may be transferred separately immediately thereafter. Warrants will be issued in certificated form only.

Exercisability

The warrants will be exercisable, at the option of each holder, in whole or in part, by delivering to us a duly executed exercise notice accompanied by payment in full for the number of shares of our common stock purchased upon such exercise (except in the case of a cashless exercise as discussed below). A holder (together with its affiliates) may not exercise any portion of the warrant to the extent that the holder would own more than 4.99% of the outstanding common stock after exercise, except that upon at least 61 days' prior notice from the holder to us, the holder may increase the amount of ownership of outstanding stock after exercising the holder's warrants up to 9.99% of the number of shares of our common stock outstanding immediately after giving effect to the exercise, as such percentage ownership is determined in accordance with the terms of the warrants.

Cashless Exercise

If, at the time a holder exercises its warrant, there is no effective registration statement registering, or the prospectus contained therein is not available for an issuance of the shares underlying the warrant to the holder, then in lieu of making the cash payment otherwise contemplated to be made to us upon such exercise in payment of the aggregate exercise price, the holder may elect instead to receive upon such exercise (either in whole or in part) the net number of shares of our common stock determined according to a formula set forth in the warrant.

Anti-Dilution Protection

The warrant provides that the exercise price is subject to adjustment in the event of stock splits, reverse stock splits and the like.

Fundamental Transactions

In the event of any fundamental transaction, as described in the warrants and generally including any merger with or into another entity, sale of all or substantially all of our assets, tender offer or exchange offer, or reclassification of our common stock, the holder will have the right to have such warrants and all obligations and rights thereunder assumed by the successor or acquiring corporation.

Transferability

Subject to applicable laws and the restriction on transfer set forth in the warrant, the warrant may be transferred at the option of the holder upon surrender of the warrant to us together with the appropriate instruments of transfer.

No Listing

There is no established trading market for the warrants and we do not expect a market to develop. In addition, we do not intend to apply for the listing of the warrants on any national securities exchange or other trading market. Without an active trading market, the liquidity of the warrants will be limited.

Right as a Shareholder

Except as otherwise provided in the warrants or by virtue of such holder's ownership of shares of our common stock, the holders of the warrants do not have the rights or privileges of holders of our common stock, including any voting rights, until they exercise their warrants.

Waivers and Amendments

Subject to certain exceptions, any term of the warrants may be amended or waived with our written consent and the written consent of the holders of at least a majority of the then-outstanding warrants.

UNDERWRITING

We have entered into an underwriting agreement with Roth Capital Partners, LLC, acting as the representative of the several underwriters named below, with respect to the shares of common stock and the related warrants subject to this offering. Subject to certain conditions, we have agreed to sell to the underwriters, and the underwriters have severally agreed to purchase, the number of shares of common stock and the related warrants provided below opposite their respective names.

Underwriters	Number of Shares	Number of Warrants
Roth Capital Partners, LLC		
Aegis Capital Corporation		
Total		

The underwriters are offering the shares of common stock and the related warrants subject to their acceptance of the shares of common stock and the related warrants from us and subject to prior sale. The underwriting agreement provides that the obligations of the several underwriters to pay for and accept delivery of the shares of common stock and the related warrants offered by this prospectus are subject to the approval of certain legal matters by their counsel and to certain other conditions. The underwriters are obligated to take and pay for all of the shares of common stock and the related warrants if any such shares and warrants are taken.

Discount, Commissions and Expenses

The underwriters have advised us that they propose to offer the shares of common stock and the related warrants to the public at the combined public offering price set forth on the cover page of this prospectus and to certain dealers at that price less a concession not in excess of $ per share of common stock and related warrant. The underwriters may allow, and certain dealers may reallow, a discount from the concession not in excess of $ per share and related warrant to certain brokers and dealers. After this offering, the combined public offering price, concession and reallowance to dealers may be changed by the representative. No such change shall change the amount of proceeds to be received by us as set forth on the cover page of this prospectus. The shares of common stock and the related warrants are offered by the underwriters as stated herein, subject to receipt and acceptance by them and subject to their right to reject any order in whole or in part. The underwriters have informed us that they do not intend to confirm sales to any accounts over which they exercise discretionary authority.

The following table shows the underwriting discount payable to the underwriters by us in connection with this offering.

	Per Share of Common Stock And Related Warrant	Total
Public offering price	$	$
Underwriting discount	$	$

We have agreed to reimburse the underwriters for certain out-of-pocket expenses not to exceed $60,000 in the aggregate without our consent which shall not be unreasonably withheld. We estimate that expenses payable by us in connection with this offering, including reimbursement of the underwriters out-of-pocket expenses, but excluding the underwriting discount referred to above, will be approximately $325,000.

Indemnification

We have agreed to indemnify the underwriters against certain liabilities, including liabilities under the Securities Act and liabilities arising from breaches of representations and warranties contained in the underwriting agreement, or to contribute to payments that the underwriters may be required to make in respect of those liabilities.

Lock-up Agreements

We, our officers, directors and certain of our stockholders have agreed, subject to limited exceptions, for a period of 90 days after the date of the underwriting agreement, not to offer, sell, contract to sell, pledge, grant any option to purchase, make any short sale or otherwise dispose of, directly or indirectly any shares of common stock or any securities convertible into or exchangeable for our common stock either owned as of the date of the underwriting agreement or thereafter acquired without the prior written consent of the representative. The representative may, in its sole discretion and at any time or from time to time before the termination of the lock-up period, without notice, release all or any portion of the securities subject to lock-up agreements.

Price Stabilization, Short Positions and Penalty Bids

The underwriters have advised us that they do not intend to conduct any stabilization or over-allotment activities in connection with this offering.

Passive Market Making

In connection with this offering, the underwriters and any selling group members may engage in passive market making transactions in our common stock on The NASDAQ Stock Market in accordance with Rule 103 of Regulation M under the Securities Exchange Act of 1934, as amended, during a period before the commencement of offers or sales of common stock and extending through the completion of the distribution. A passive market maker must display its bid at a price not in excess of the highest independent bid of that security. However, if all independent bids are lowered below the passive market maker's bid, that bid must then be lowered when specified purchase limits are exceeded.

Electronic Distribution

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

Other

From time to time, certain of the underwriters and/or their affiliates have provided, and may in the future provide, various investment banking and other financial services for us for which services they have received and, may in the future receive, customary fees. In the course of their businesses, the underwriters and their affiliates may actively trade our securities or loans for their own account or for the accounts of customers, and, accordingly, the underwriters and their affiliates may at any time hold long or short positions in such securities or loans. Except for services provided in connection with this offering, no underwriter has provided any investment banking or other financial services to us during the 180-day period preceding the date of this prospectus and we do not expect to retain any underwriter to perform any investment banking or other financial services for at least 90 days after the date of this prospectus. Aegis Capital Corporation, or Aegis, owns warrants to purchase 21,875 shares of our common stock and representatives of Aegis own warrants to purchase an additional 50,374 shares of our common stock.

NOTICE TO INVESTORS

Notice to Investors in the United Kingdom

In relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (each, a "Relevant Member State") an offer to the public of any securities which are the subject of the offering contemplated by this prospectus [supplement and the related prospectus] may not be made in that Relevant Member State except that an offer to the public in that Relevant Member State of any such securities may be made at any time under the following exemptions under the Prospectus Directive, if they have been implemented in that Relevant Member State:

(a) to legal entities which are authorized or regulated to operate in the financial markets or, if not so authorized or regulated, whose corporate purpose is solely to invest in securities;

(b) to any legal entity which has two or more of (1) an average of at least 250 employees during the last financial year; (2) a total balance sheet of more than €43,000,000 and (3) an annual net turnover of more than €50,000,000, as shown in its last annual or consolidated accounts;

(c) by the underwriter to fewer than 100 natural or legal persons (other than qualified investors as defined in the Prospectus Directive); or

(d) in any other circumstances falling within Article 3(2) of the Prospectus Directive, provided that no such offer of these securities shall result in a requirement for the publication by the issuer or the underwriter of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer to the public" in relation to any of the securities in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and any such securities to be offered so as to enable an investor to decide to purchase any such securities, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State and the expression "Prospectus Directive" means Directive 2003/71/EC and includes any relevant implementing measure in each Relevant Member State.

Each underwriter has represented, warranted and agreed that:

(a) it has only communicated or caused to be communicated and will only communicate or cause to be communicated any invitation or inducement to engage in investment activity (within the meaning of section 21 of the Financial Services and Markets Act 2000 (the FSMA)) received by it in connection with the issue or sale of any of the securities in circumstances in which section 21(1) of the FSMA does not apply to the issuer; and

(b) it has complied with and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to the securities in, from or otherwise involving the United Kingdom.

European Economic Area

In particular, this document does not constitute an approved prospectus in accordance with European Commission's Regulation on Prospectuses no. 809/2004 and no such prospectus is to be prepared and approved in connection with this offering. Accordingly, in relation to each Member State of the European Economic Area which has implemented the Prospectus Directive (being the Directive of the European Parliament and of the Council 2003/71/EC and including any relevant implementing measure in each Relevant Member State) (each, a Relevant Member State), with effect from and including the date on which the Prospectus Directive is implemented in that Relevant Member State (the Relevant Implementation Date) an offer of securities to the public may not be made in that Relevant Member State prior to the publication of a prospectus in relation to such securities which has been approved by the competent authority in that Relevant Member State or, where appropriate, approved in another Relevant Member State and notified to the competent authority in that Relevant Member State, all in accordance with the Prospectus Directive, except that it may, with effect from and including the Relevant Implementation Date, make an offer of securities to the public in that Relevant Member State at any time:

- to legal entities which are authorized or regulated to operate in the financial markets or, if not so authorized or regulated, whose corporate purpose is solely to invest in securities;

- to any legal entity which has two or more of (1) an average of at least 250 employees during the last financial year; (2) a total balance sheet of more than €43,000,000; and (3) an annual net turnover of more than €50,000,000, as shown in the last annual or consolidated accounts; or

- in any other circumstances which do not require the publication by the Issuer of a prospectus pursuant to Article 3 of the Prospectus Directive.

For the purposes of this provision, the expression an "offer of securities to the public" in relation to any of the securities in any Relevant Member State means the communication in any form and by any means of sufficient information on the terms of the offer and the securities to be offered so as to enable an investor to decide to purchase or subscribe for the securities, as the same may be varied in that Member State by any measure implementing the Prospectus Directive in that Member State. For these purposes the securities offered hereby are "securities."

LEGAL MATTERS

The validity of the shares of common stock and warrants offered hereby will be passed upon for us by Gracin & Marlow, LLP, New York, New York. Lowenstein Sandler LLP, New York, New York, is acting as counsel to the underwriters in this offering.

EXPERTS

The consolidated financial statements as of December 31, 2015 and 2014 and for each of the two years in the period ended December 31, 2015 included in this Prospectus and in the Registration Statement have been so included in reliance on the report of BDO USA, LLP, an independent registered public accounting firm, (the report on the financial statements contains an explanatory paragraph regarding our ability to continue as a going concern) appearing elsewhere herein and in the Registration Statement, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed with the Securities and Exchange Commission a registration statement on Form S-1 under the Securities Act with respect to the securities offered by this prospectus. This prospectus, which is part of the registration statement, omits certain information, exhibits, schedules and undertakings set forth in the registration statement. For further information pertaining to us and the securities offered hereby, reference is made to the registration statement and the exhibits and schedules to the registration statement. Statements contained in this prospectus as to the contents or provisions of any documents referred to in this prospectus are not necessarily complete, and in each instance where a copy of the document has been filed as an exhibit to the registration statement, reference is made to the exhibit for a more complete description of the matters involved.

You may read and copy all or any portion of the registration statement without charge at the public reference room of the Securities and Exchange Commission at 100 F Street, N.E., Washington, D.C. 20549. Copies of the registration statement may be obtained from the Securities and Exchange Commission at prescribed rates from the public reference room of the Securities and Exchange Commission at such address. You may obtain information regarding the operation of the public reference room by calling 1-800-SEC-0330. In addition, registration statements and certain other filings made with the Securities and Exchange Commission electronically are publicly available through the Securities and Exchange Commission's website at http://www.sec.gov. The registration statement, including all exhibits and amendments to the registration statement, has been filed electronically with the Securities and Exchange Commission. You may also read all or any portion of the registration statement on our website at www.heatbio.com. The information contained in, and that can be accessed through, our website is not incorporated into and is not part of this prospectus.

We are subject to the information and periodic reporting requirements of the Exchange Act and, accordingly, are required to file annual reports containing financial statements audited by an independent public accounting firm, quarterly reports containing unaudited financial data, current reports, proxy statements and other information with the Securities and Exchange Commission. You will be able to inspect and copy such periodic reports, proxy statements and other information at the Securities and Exchange Commission's public reference room, the website of the Securities and Exchange Commission referred to above, and our website referred to above.

INDEX TO FINANCIAL STATEMENTS

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Board of Directors and Stockholders
Heat Biologics, Inc.
Durham, North Carolina

We have audited the accompanying consolidated balance sheets of Heat Biologics, Inc. ("the Company") as of December 31, 2015 and 2014 and the related consolidated statements of operations and comprehensive loss, stockholders' equity, and cash flows for each of the two years in the period ended December 31, 2015. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these consolidated 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 consolidated financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit also includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements, assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of Heat Biologics, Inc. at December 31, 2015 and 2014, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2015**,** in conformity with accounting principles generally accepted in the United States of America.

The accompanying consolidated financial statements have been prepared assuming that the Company will continue as a going concern. As described in Note 2 to the consolidated financial statements, the Company has suffered recurring losses from operations and has not generated significant revenue or positive cash flows from operations. These factors raise substantial doubt about the Company's ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 2. The consolidated financial statements do not include any adjustments that might result from the outcome of this uncertainty.

/s/ BDO USA, LLP

Raleigh, North Carolina
February 18, 2016

HEAT BIOLOGICS, INC.
Consolidated Balance Sheets
(in thousands, except share and per share data)

	December 31, 2015	December 31, 2014
Current Assets		
Cash and cash equivalents	$ 4,940	$ 3,714
Investments, held to maturity (net)	6,690	10,699
Prepaid expenses and other current assets	869	863
Total Current Assets	12,499	15,276
Property and Equipment, net	446	446
Other Assets		
Restricted cash	101	101
Deposits	70	20
Related party receivable	58	49
Deferred financing costs	44	24
Total Other Assets	273	194
Total Assets	$ 13,218	$ 15,916
Liabilities and Stockholders' Equity		
Current Liabilities		
Accounts payable	$ 1,980	$ 1,367
Accrued expenses and other payables	1,847	806
Current portion of long term debt	3,134	397
Total Current Liabilities	6,961	2,570
Long Term Liabilities		
Long term debt, net of discount and current portion	3,612	2,314
Other long term liabilities	150	—
Total Liabilities	10,723	4,884
Commitments and Contingencies		
Stockholders' Equity		
Common stock, $.0002 par value; 50,000,000 shares authorized, 8,424,641 and 6,492,622 issued and outstanding at December 31, 2015 and 2014, respectively	1	1
Additional paid-in capital	48,567	35,895
Accumulated deficit	(44,430)	(24,135)
Accumulated other comprehensive loss	(87)	—
Total Stockholders' Equity - Less Non-Controlling Interest	4,051	11,761
Non-Controlling Interest	(1,556)	(729)
Total Stockholders' Equity – Heat Biologics, Inc.	2,495	11,032
Total Liabilities and Stockholders' Equity	$ 13,218	$ 15,916

See Notes to Consolidated Financial Statements

HEAT BIOLOGICS INC.
Consolidated Statements of Operations and Comprehensive Loss
(in thousands, except share and per share data)

	Year ended, December 31,	
	2015	**2014**
Operating expenses:		
Research and development	$ 2,595	$ 2,861
Clinical and regulatory	14,071	5,348
General and administrative	4,356	3,978
Total operating expenses	21,022	12,187
Loss from operations	(21,022)	(12,187)
Non-operating income (expenses)		
Interest income	66	41
Other income (expense)	198	(24)
Interest expense	(364)	(73)
Total non-operating expenses	(100)	(56)
Net loss	(21,122)	(12,243)
Net loss - non-controlling interest	(827)	(454)
Net loss attributable to Heat Biologics, Inc.	$ (20,295)	$ (11,789)
Net loss per share attributable to Heat Biologics, Inc.-		
basic and diluted	$ (2.53)	$ (1.83)
Weighted-average number of common shares used in net loss per share attributable to Heat Biologics, Inc. -		
basic and diluted	8,015,687	6,454,866
Net loss	(21,122)	(12,243)
Other comprehensive loss:		
Unrealized loss on foreign currency translation	(87)	—
Total comprehensive loss	(21,209)	(12,243)
Comprehensive loss attributable to non-controlling interest	(827)	(454)
Comprehensive loss attributable to Heat Biologics, Inc.	$ (20,382)	$ (11,789)

See Notes to Consolidated Financial Statements

HEAT BIOLOGICS INC.
Consolidated Statements of Stockholders' Equity
(in thousands, except share amounts)

	Common Stock	APIC	Accumulated Deficit	Accumulated Other Comprehensive Loss	Non-Controlling Interest	Total Stockholders Equity
Balance at December 31, 2013	$ 1	$ 34,338	$ (12,346)	$ —	$ (275)	$ 21,718
Exercise of stock options, 66,707 shares	—	38	—	—	—	38
Cashless exercise of options, 10,442 shares	—	—	—	—	—	—
Cashless exercise of warrants, 40,047 shares	—	453	—	—	—	453
Stock-based compensation	—	1,066	—	—	—	1,066
Net loss	—	—	(11,789)	—	(454)	(12,243)
Balance at December 31, 2014	$ 1	$ 35,895	$ (24,135)	$ —	$ (729)	$ 11,032
March 2015 Investment offering, 1,886,000 shares, net of underwriters discounts	—	11,400	—	—	—	11,400
Stock issuance costs		(302)	—	—	—	(302)
Cashless exercise of options, 6,812 shares	—	—	—	—	—	—
Vesting of restricted stock, 39,207 shares	—	—	—	—	—	—
Stock-based compensation	—	1,574	—	—	—	1,574
Other comprehensive loss	—	—	—	(87)	—	(87)
Net loss	—	—	(20,295)	—	(827)	(21,122)
Balance at December 31, 2015	$ 1	$ 48,567	$ (44,430)	$ (87)	$ (1,556)	$ 2,495

See Notes to Consolidated Financial Statements

HEAT BIOLOGICS, INC.
Consolidated Statements of Cash Flows
(in thousands)

	For the year ended December 31,	
	2015	**2014**
Cash Flows from Operating Activities		
Net loss	$ (21,122)	$ (12,243)
Adjustments to reconcile net loss to net cash used in operating activities:		
Depreciation	116	67
Amortization of deferred financing costs and debt issuance costs	101	38
Amortization of held to maturity investment premium	142	173
Re-measurement of fair value of stock warrant liability	—	7
Stock based compensation	1,574	1,066
Increase (decrease) in cash arising from changes in assets and liabilities:		
Related party receivable	(9)	(24)
Prepaid expenses and other current assets	(32)	203
Restricted cash	—	(100)
Deposits	(50)	(10)
Accounts payable	642	716
Accrued expenses and other payables	1,041	303
Other long term liabilities	150	—
Accrued interest	—	(25)
Net Cash Used in Operating Activities	(17,447)	(9,829)
Cash Flows from Investing Activities		
Proceeds from maturities of short-term investments	14,957	18,624
Purchases of short term investments	(11,090)	(12,199)
Purchase of property and equipment	(116)	(459)
Net Cash Provided by Investing Activities	3,751	5,966
Cash Flows from Financing Activities		
Proceeds from March 2015 public offering, net of underwriting discounts	11,400	—
Stock issuance costs	(302)	—
Proceeds from issuance of long term debt, net	4,471	2,973
Payments on long term debt	(558)	—
Proceeds from the exercise of stock options	—	37
Net Cash Provided by Financing Activities	15,011	3,010
Effect of exchange rate changes on cash and cash equivalents	(89)	—
Net Increase (Decrease) in Cash and Cash Equivalents	1,226	(853)
Cash and Cash Equivalents - Beginning of Period	3,714	4,567
Cash and Cash Equivalents - End of Period	$ 4,940	$ 3,714
Supplemental Disclosure for Cash Flow Information		
Interest paid	$ 262	$ 32
Supplemental Schedule of Noncash Investing and Financing Activities		
Cashless exercise of stock options	$ 33	$ —
Cashless exercise of stock warrants	$ —	$ 453
Issuance of warrants	$ —	$ 323

See Notes to Consolidated Financial Statements

1. Organization

Heat Biologics, Inc. ("Heat" or "the Company") was incorporated in 2008 pursuant to the laws of the state of Delaware. Heat is a development stage company focused on developing novel allogeneic, "off-the-shelf" cellular therapeutic vaccines to combat a wide range of cancers. The Company currently has two drug candidates, one in a Phase 2 trial for bladder cancer, and one in a Phase 1b trial for non-small cell lung cancer.

Heat owns 92.5% interest in its subsidiary, Heat Biologics I, Inc. On May 30, 2012, Heat formed two-wholly owned subsidiaries, Heat Biologics III, Inc. ("Heat III") and Heat Biologics, IV, Inc. ("Heat IV"). Heat formed Heat Biologics GmbH (Heat GmbH), a wholly-owned limited liability company, organized in Germany on September 11, 2012. Heat also formed Heat Biologics Australia Pty LTD, a wholly-owned proprietary company, registered in Australia on March 14, 2014.

Heat's product candidates require clinical trials and approvals from regulatory agencies, as well as acceptance in the marketplace. Part of Heat's strategy is to develop and commercialize some of its product candidates by continuing existing arrangements with academic and corporate collaborators and licensees and by entering into new collaborations.

2. Summary of Significant Accounting Policies

Going Concern

The accompanying consolidated financial statements have been prepared on a going concern basis. The Company has an accumulated a deficit of approximately $44.4 million as of December 31, 2015 and a net loss of approximately $20.3 million for the year ended December 31, 2015, and has not generated significant revenue or positive cash flows from operations. These factors raise substantial doubt about the Company's ability to continue as a going concern. The accompanying consolidated financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or amounts of liabilities that might result from the outcome of this uncertainty. To meet its capital needs, the Company is considering multiple alternatives, including, but not limited to, additional equity financings, debt financings and/or funding from partnerships or collaborations. There can be no assurance that the Company will be able to complete any such transactions on acceptable terms or otherwise. If the Company is unable to obtain the necessary capital, it will need to pursue a plan to scale back its operations, license or sell its assets, seek to be acquired by another entity and/or cease operations and comprehensive loss.

Principles of Consolidation

The consolidated financial statements include the accounts of Heat Biologics, Inc. and its subsidiaries, Heat Biologics I, Inc. ("Heat I") Heat Biologics III, Inc. ("Heat III"), Heat Biologics IV, Inc. ("Heat IV"), Heat Biologics GmbH and Heat Biologics Australia Pty Ltd. The functional currency of the entities located outside the United States of America (the foreign entities) is the applicable local currency of the foreign entities. Assets and liabilities of the foreign entities are translated at period-end exchange rates. Statement of operations accounts are translated at the average exchange rate during the period. The effects of foreign currency translation adjustments are included in other comprehensive loss, which is a component of accumulated other comprehensive loss in stockholders' equity. All significant intercompany accounts and transactions have been eliminated in consolidation. At December 31, 2015 and 2014, Heat held a 92.5% controlling interest in Heat I and accounts for its less than 100% interest in the consolidated financial statements in accordance with U.S. GAAP. Accordingly, the Company presents non-controlling interest as a component of stockholders' equity on its consolidated balance sheets and reports non-controlling interest net loss under the heading "net loss – non-controlling interest" in the consolidated statements of operations.

Use of Estimates

The preparation of financial statements in conformity with U.S. GAAP requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Estimates are used for, but not limited to, useful lives of fixed assets, income taxes and stock-based compensation. Actual results may differ from those estimates.

Cash and Cash Equivalents and Restricted Cash

The Company considers all cash and other highly liquid investments with initial maturities from the date of purchase of three months or less to be cash and cash equivalents. The Company had a restricted cash balance of $0.1 million at December 31, 2015 and 2014, respectively. The United States Patent and Trade Office ("USPTO") requires the Company to maintain an account with a minimum of $1,000 to be used to pay fees associated with new trademarks of the Company and one of the Company's lenders required a minimum $0.1 million cash balance to be maintained with the lending bank to secure the Company credit card during 2015 and 2014.

Concentration of Credit Risk

At times, cash balances may exceed the Federal Deposit Insurance Corporation ("FDIC") insurable limits. The Company has never experienced any losses related to these balances. As of December 31, 2015 and 2014, cash amounts in excess of $0.3 million were not fully insured. The uninsured cash balance as of December 31, 2015 was $4.7 million. The Company does not believe it is exposed to significant credit risk on cash and cash equivalents.

Deferred Financing Costs, net

Deferred financing costs, net include the costs incurred to obtain financing and are amortized using the straight-line method, which approximates the effective interest method, over the life of the related debt. Deferred financing costs, net are included in the accompanying consolidated balance sheets net of amortization.

Property and Equipment

Property and equipment are stated at cost and are capitalized. Depreciation is calculated using the straight-line method and is based on estimated useful lives of five years for lab equipment and computer equipment, and seven years for furniture and fixtures.

Net Loss per Share

Basic net loss per share is computed by dividing net loss by the weighted average number of common shares outstanding during each year. Fully diluted net loss per share is computed using the weighted average number of common shares and dilutive securities outstanding during each year. Dilutive securities having an anti-dilutive effect on diluted loss per share are excluded from the calculation.

Fair Value of Financial Instruments

The carrying amount of certain of the Company's financial instruments, including cash and cash equivalents, accounts payable and accrued expenses and other payables approximate fair value due to their short maturities. The carrying value of debt approximates fair value because the interest rate under the obligation approximates market rates of interest available to the Company for similar instruments.

As a basis for determining the fair value of certain of the Company's financial instruments, the Company utilizes a three-tier value hierarchy, which prioritizes the inputs used in measuring fair value as follows:

Level I – Observable inputs such as quoted prices in active markets for identical assets or liabilities.

Level II – Observable inputs, other than Level I 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 III – Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

This hierarchy requires the Company to use observable market data, when available, and to minimize the use of unobservable inputs when determining fair value. The Company does not have any financial instruments that are measured at fair value on a recurring basis. There were no assets or liabilities measured at fair value on a recurring basis as of December 31, 2015 or 2014.

Marketing

Marketing costs are expensed as incurred and is included in clinical and regulatory expense in the consolidated statement of operations and comprehensive loss. Marketing expense totaled $0.3 million and $0.1 million for the years ended December 31, 2015 and 2014, respectively.

Income Tax

Income taxes are accounted for using the asset and liability method. Deferred tax assets and liabilities are recognized for the future tax consequences attributable to temporary differences between the carrying amounts of assets and liabilities and their respective tax bases, operating loss carryforwards, and tax credit carryforwards. Deferred tax assets and liabilities are measured using enacted tax rates expected to apply to taxable income in the years in which those temporary differences are expected to be recovered or settled. The effect on deferred tax assets and liabilities of a change in tax rates is recognized in income in the period that includes the enactment date.

In accordance with FASB ASC 740,*Accounting for Income Taxes*, the Company reflects in the financial statements the benefit of positions taken in a previously filed tax return or expected to be taken in a future tax return only when it is considered 'more-likely-than-not' that the position taken will be sustained by a taxing authority. As of December 31, 2015 and 2014, the Company had no unrecognized income tax benefits and correspondingly there is no impact on the Company's effective income tax rate associated with these items. The Company's policy for recording interest and penalties relating to uncertain income tax positions is to record them as a component of income tax expense in the accompanying consolidated statements of operations and comprehensive loss. As of December 31, 2015 and 2014, the Company had no such accruals.

Stock-Based Compensation

The Company accounts for stock-based compensation arrangements with employees and non-employee directors using a fair value method which requires the recognition of compensation expense for costs related to all stock-based payments, including stock options. The fair value method requires the Company to estimate the fair value of stock-based payment awards on the date of grant using an option pricing model.

Stock-based compensation costs are based on the fair value of the underlying option calculated using the Black-Scholes-Merton option pricing model on the date of grant for stock options and are recognized as expense on a straight-line basis over the requisite service period, which is the vesting period. Determining the appropriate fair value model and related assumptions requires judgment, including estimating stock price volatility, forfeiture rates and expected term. The expected volatility rates are estimated based on the actual volatility of comparable public companies over the expected term. The expected term for the years ended December 31, 2015 and 2014 represents the average time that options are expected to be outstanding based on the mid-point between the vesting date and the end of the contractual term of the award. Forfeitures are estimated at the time of grant and revised, if necessary, in subsequent periods if actual forfeitures differ from those estimates. The Company has not paid dividends and does not anticipate paying a cash dividend in the foreseeable future and, accordingly, uses an expected dividend yield of zero. The risk-free interest rate is based on the rate of U.S. Treasury securities with maturities consistent with the estimated expected term of the awards. The measurement of nonemployee share-based compensation is subject to periodic adjustments as the underlying equity instruments vest and is recognized as an expense in the period over which services are received.

Net loss attributable to non-controlling interests

Net loss attributable to non-controlling interests is the result of the Company's consolidation of subsidiaries of which it does not own 100%. The Company's net loss attributable to non-controlling interests relates to the University of Miami's ownership in Heat I, for the years ended December 31, 2015 and 2014.

Revenue Recognition

The Company recognizes government grants when there is reasonable assurance that they will comply with the conditions attached to the grants and the grants will be received. The grants are recognized using an income approach and grant revenue is recognized as the related expenses are incurred.

Research and Development

Research and development costs are expensed as incurred. The Company has acquired exclusive licensing rights to intellectual property to further its research and development. These costs are expensed as incurred. The Company also incurs intellectual property costs relating to the filing and application fees for patents which are owned by the universities with which the Company has license agreements. These costs are also expensed as research and development expense as incurred.

Impact of recently issued Accounting Standards:

In August 2014, the FASB issued ASU 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*. The amendments in ASU 2014-15 are intended to define management's responsibility to evaluate whether there is substantial doubt about an organization's ability to continue as a going concern and to provide related footnote disclosures. This ASU provides guidance to an organization's management, with principles and definitions that are intended to reduce diversity in the timing and content of disclosures that are commonly provided by organizations today in the financial statement footnotes. This update is effective for annual periods ending after December 15, 2016, and interim periods within annual periods beginning after December 15, 2016. Early application is permitted for annual or interim reporting periods for which the financial statements have not previously been issued. The adoption of this guidance is not expected to have a material impact on the Company's consolidated financial statements.

In January 2015, the FASB issued ASU 2015-1,*Income Statement - Extraordinary and Unusual Items.* ASU 2015-01 will eliminate from U.S. GAAP the concept of extraordinary items and will no longer require an entity to separately classify, present, and disclose extraordinary events and transactions. ASU 2015-01 is effective for fiscal years, and interim periods within those fiscal years, beginning after December 15, 2015, and early adoption is permitted provided that the guidance is applied from the beginning of the fiscal year of adoption. The Company does not believe the adoption of this guidance will have a material impact on its consolidated financial statements or related footnote disclosures.

In April 2015, the FASB issued ASU 2015-03, Interest -*Imputation of Interest (Subtopic 835-30): Simplifying the Presentation of Debt Issuance Costs*("ASU 2015-03"). ASU 2015-03 revises Subtopic 835-30 to require that debt issuance costs be reported in the balance sheet as a direct deduction from the face amount of the related liability, consistent with the presentation of debt discounts. Prior to the amendments, debt issuance costs were presented as a deferred charge (i.e., an asset) on the balance sheet. The amendments are effective for public business entities for fiscal years beginning after December 15, 2015, and interim periods within those fiscal years. The amendments must be applied retrospectively. All entities have the option of adopting the new requirements as of an earlier date for financial statements that have not been previously issued. The Company does not expect believe the adoption of this guidance will have a material impact on its consolidated financial statements or related footnote disclosures.

In January 2016, the FASB issued ASU 2016-01,*Recognition and Measurement of Financial Assets and Financial Liabilities*. ASU 2016-01 requires equity investments to be measured at fair value with changes in fair value recognized in net income; simplifies the impairment assessment of equity investments without readily determinable fair values by requiring a qualitative assessment to identify impairment; eliminates the requirement for public business entities to disclose the method(s) and significant assumptions used to estimate the fair value that is required to be disclosed for financial instruments measured at amortized cost on the balance sheet; requires public business entities to use the exit price notion when measuring the fair value of financial instruments for disclosure purposes; requires an entity to present separately in other comprehensive income the portion of the total change in the fair value of a liability resulting from a change in the instrument-specific credit risk when the entity has elected to measure the liability at fair value in accordance with the fair value option for financial instruments; requires separate presentation of financial assets and financial liabilities by measurement category and form of financial assets on the balance sheet or the accompanying notes to the financial statements and clarifies that an entity should evaluate the need for a valuation allowance on a deferred tax asset related to available-for-sale securities in combination with the entity's other deferred tax assets. ASU 2016-01 is effective for financial statements issued for fiscal years beginning after December 15, 2017, and interim periods within those fiscal years. The Company does not expect believe the adoption of this guidance will have a material impact on its consolidated financial statements or related footnote disclosures.

3. Investments

Investments in certain securities may be classified into three categories:

- *Held-to-maturity* - Debt securities that the Company has the positive intent and ability to hold to maturity are reported at amortized cost.
- *Trading securities* - Debt and equity securities that are bought and held principally for the purpose of selling in the near term are reported at fair value with unrealized gains and losses included in earnings.
- *Available-for-sale* - Debt and equity securities not classified as either securities held-to-maturity or trading securities are reported at fair value with unrealized gains or losses excluded from earnings and reported as a separate component of stockholders' equity.

The Company reassesses the appropriateness of the classification of its investments at the end of each reporting period. The Company has determined that its debt securities should be classified as held-to-maturity as of December 31, 2015 and 2014. This classification was based upon management's determination that it has the positive intent and ability to hold the securities until their maturity dates, as all of the investments mature within 6 months and the underlying cash invested in these securities is not required for current operations.

Investments consist of short-term FDIC insured certificates of deposit, commercial paper rated A1/P1 or above and corporate notes and bonds rated A and above carried at amortized cost using the effective interest method.

The following summarizes information about short term investments at December 31, 2015 and 2014, respectively (in thousands):

	Amortized Cost	Gross Unrealized Losses	Estimated Fair Value
2015			
Certificates of deposit, commercial paper	$ 6,690	$ 5	$ 6,685
2014			
Certificates of deposit, commercial paper	$ 10,699	$ 2	$ 10,697

As of December 31, 2015 and 2014, the estimated fair value of the investments was less than the amortized cost. Because management intends to hold the investments until their maturity dates, these unrealized losses were not recorded in the consolidated financial statements.

The maturities of held-to-maturity investments at December 31, 2015 and 2014, respectively were as follows (in thousands):

	Less than 1 Year	Total
2015		
Certificates of deposit, commercial paper	$ 6,690	$ 6,690
2014		
Certificates of deposit, commercial paper	$ 10,699	$ 10,699

4. Property and Equipment

Property and equipment are recorded at cost and depreciated using the straight-line method over estimated useful lives ranging generally from five to seven years. Expenditures for maintenance and repairs are charged to expense as incurred.

Property and equipment consisted of the following at (in thousands):

	December 31,	
	2015	2014
Lab equipment	$ 541	$ 448
Computers	41	24
Furniture and fixtures	56	50
Total	638	522
Accumulated depreciation	(192)	(76)
Property and equipment, net	$ 446	$ 446

Depreciation expense totaled $0.1 million and $0.07 million for the years ended December 31, 2015 and 2014, respectively.

5. Accrued Expenses

Accrued expenses consist of the following at (in thousands):

	December 31,	
	2015	2014
Accrued clinical trial expenses	$ 1,193	$ 196
Compensation and related benefits	561	519
Deferred rent	53	51
Patent fees	40	40
	$ 1,847	$ 806

6. Debt Issuance Costs

During 2014, the Company recorded $0.3 million to debt discount for the initial fair value of the warrant to purchase common stock and $0.03 million to deferred financing costs related to third party fees paid in connection to the Square 1 Bank loan, which are amortized over the 42 month term of the loan.

Total amortization expense for the debt issuance costs was $0.1 million and $0.04 million during fiscal year 2015 and 2014, respectively.

7. Notes Payable

In August 2014, the Company entered into a secured loan with Square 1 Bank ("Loan"). The Loan provides the Company with a term loan in the aggregate principal amount not to exceed $7.5 million to be used to supplement working capital. The Loan is available to the Company in four tranches: $1.5 million was made available to the Company on August 22, 2014 ("Tranche 1 Loan"), $1.5 million became available to the Company upon enrollment of the first patient in its the Phase 2 clinical trial for HS-110 ("Tranche 2 Loan"), $2.25 million was made available to the Company upon the initiation of the Phase 1B trial for lung cancer indication on June 30, 2015 ("Tranche 3 Loan"), and $2.25 million was made available to the Company upon Square 1 Bank's receipt on December 30, 2015 of the full enrollment of our Phase 1/2 clinical trial for HS-410 ("Tranche 4 Loan"). As of December 31, 2014, the Company had drawn down $1.5 million each under the Tranche 1 Loan and Tranche 2 Loan, totaling $3.0 million. At December 31, 2015, the Company had drawn down the entire $7.5 million available under the Loan.

The Loan accrues interest monthly at an interest rate of 3.05% plus the prime rate or 6.30% per annum, whichever is greater. The Tranche 1 Loan was payable as interest-only period until June 30, 2015 and thereafter is payable in monthly installments of principal plus accrued interest until February 22, 2018. The Tranche 2 Loan is payable as interest-only prior to October 31, 2015 and thereafter is payable in monthly installments of principal plus accrued interest until February 22, 2018. The Tranche 3 Loan is payable as interest-only prior to October 31, 2015 and thereafter is payable in monthly installments of principal plus accrued interest until February 22, 2018. The Tranche 4 Loan is payable in monthly installments of principal plus accrued interest until February 22, 2018. During the year ended December 31, 2014, the Company made $0 in principal payments and $24,150 in interest payments on the outstanding loan. During the year ended December 31, 2015, the Company made $0.4 million in principal payments and $0.3 million in interest payments on the outstanding loan. The agreement with Square 1 Bank sets forth various affirmative and negative covenants. The failure of the Company to comply with one or more of the covenants constitutes a default under the Loan. The covenants include the Company having at least two ongoing clinical trials at all times, the attainment of the funding conditions set forth in the agreement and covenants regarding financial reporting, limits on the Company's cash burn, incurrence of indebtedness, permitted investments, encumbrances, distributions, investments and mergers and acquisitions. The Loan is also secured by a security interest in all of the Company's personal property, excluding its intellectual property. The Company is in compliance with the covenants of the Loan as of December 31, 2015.

In connection with the Loan, in August 2014, the Company issued Square 1 Bank warrant, exercisable for 52,695 shares of the Company's common stock at an exercise price of $4.27. In accordance with ASC 480-10, *Distinguishing Liabilities from Equity*, the freestanding warrant for the Company's common stock was recognized as a liability and recorded at fair value in all periods prior to exercise. The warrant liability was re-measured to fair value prior to reclassification to additional paid in capital upon its exercise. The initial fair value of the warrant of $0.3 million was recorded as a liability and a discount to notes payable and is being amortized to interest expense over the term of the Loan. The debt discount was $0.2 million and $0.3 million as of December 31, 2015 and 2014, respectively. In September 2014, the warrant was exercised via a cashless exercise into 17,664 shares of the Company's common stock. The fair value of the warrant is shown as a debt discount and is netted against the outstanding loan balance in the consolidated balance sheets.

As of December 31, 2015, future principal payments under the Company's notes payable agreement are as follows (in thousands):

Years ending December 31,	
2016	$ 3,226
2017	3,226
2018	490
Total	$ 6,942

8. License Agreements

- *University of Miami*

  - Beginning in 2008, the Company has entered into various agreements with the University of Miami (the"University") for intellectual and tangible property rights relating to the *ImPACT*™, technology activities ("License Agreement 03-31, 05-39" and "License Agreement 97-14", or collectively "License Agreements"). These license agreements were subsequently assigned to the Company's subsidiary Heat Biologics I, Inc. which issued to the University shares of its common stock representing seven and one half percent (7.5%) of its common stock. The term of the license is the length of the last to expire patent, unless terminated earlier.

  - The Company agreed to make minimum royalty payments of $10,000 for three years beginning in 2010 that are due on the anniversary date of the agreement for License Agreement 97-14. Beginning in 2013, and thereafter for the life of the agreement, the minimum royalty payment shall be $20,000 due on the same date. A milestone payment is due no later than May 2017 of $250,000 for License Agreement 97-14.

  - In August 2009, Heat I and the University entered into a second amendment ("Amendment 2") to License Agreement 97-14 to extend the foregoing payment due dates for all past due license fees and patent costs.

  - On February 18, 2011, Heat I entered into a license agreement ("SS114A") with the University to obtain additional technology related to License Agreement 97-14. Heat I agreed to reimburse the University for all past patent costs of $37,381. As partial consideration for SS114A, Heat II agreed to grant back certain exclusive rights to the University.

  - On February 18, 2011, Heat I entered into a license agreement ("143") with the University to obtain additional technology related to License Agreement 97-14. In consideration for 143, Heat I agreed to pay the University a fee of $50,000 and reimburse them for past patent costs of $14,158.

  - On February 18, 2011, Heat I entered into a license agreement ("J110") with the University to obtain additional technology related to License Agreement 97-14. In consideration for J110, Heat I agreed to pay the University a fee of $10,000 and reimburse them for past patent costs of $1,055.

  - On February 18, 2011, Heat I entered into a license agreement ("D-107") with the University to obtain additional technology related to License Agreement 97-14. There are no financial obligations on our part under the arrangement.

  - In addition, Heat entered into an agreement for "Modified Heat Shock Proteins-Antigenic Peptide Complex" with the University of Miami in September 2014 for a cancer cell line where the University agreed not to license the cell line to third parties while the Company is in good standing and in compliance of its patent license agreements with the University relating to our *ImPACT*® platform. There is no financial obligation on the Company's part under the arrangement.

- *Other License Agreements*

  - On April 12, 2011, Heat entered into a non-exclusive evaluation and biological material license agreement with a not-for-profit corporation for evaluation and production of vaccines. In consideration for the evaluation and commercial use license, Heat agreed to pay the not-for-profit corporation a fee of $5,000 and $50,000, respectively. Heat has the option to renew the license once the original term has expired. Milestone payments are due upon certain events agreed upon by Heat and the not-for-profit corporation. In December 2015, Heat amended the evaluation and biological material license agreement to add additional cell lines in exchange for a one-time payment of $1,000.

- On August 30, 2010, Heat entered into an option agreement with the University of Michigan ("University II") to acquire the right to negotiate an exclusive license for certain materials which include cancer cells and all unmodified derivatives of these cells. An option fee of $2,000 was paid on September 8, 2010 to grant a period of nine months for this consideration. In July 2011, the Company exercised the option to acquire the license for $10,000.

- On September 23, 2014, Heat entered into an exclusive license agreement for a multiple myeloma cell line with Professor Kenneth Nilsson in Sweden. In consideration of the commercial license, Heat agreed to pay an up-front license fee of $5,000 and is obligated to pay an annual maintenance fee of $3,000 each year until the first commercial sale of a licensed product at which time the annual maintenance fee increases to $30,000. Milestone payments are due upon certain events agreed upon by Heat and Professor Kenneth Nilsson.

- In August 2015, the Company entered into an exclusive license agreement with Columbia University for an endometrial cancer cell line for the production, sale and use for all human healthcare applications. The term of the license is perpetual, unless terminated earlier by us or by Columbia University. Columbia University can only terminate for our material breach of this agreement. The Company paid an up-front license fee of $7,500 and is obligated to pay an annual maintenance fee of $5,000 each year until the first commercial sale of a licensed product at which time the annual maintenance fee increases to $50,000. The Company agreed to pay royalties equal to a one-tenth of low single digit percentage of net sales of licensed products. In addition, the Company is obligated to make milestone payments of $25,000, $40,000 and $75,000 upon completion of a Phase 1, Phase 2 and Phase 3 trial, respectively, $200,000 upon the first commercial sale of a licensed product and $500,000 upon annual net sales of $100,000,000 or more.

Future minimum royalty payments as of December 31, 2015 are as follows (in thousands):

Year ended December 31,	
2016	$ 38
2017	338
2018	38
2019	113
2020	288
Total	$ 815

9. Stockholders' Equity

Authorized Capital

Heat has authorized 10,000,000 shares of Preferred Stock (par value $0.0001) as of December 31, 2015 and 2014. As of December 31, 2015 and 2014, there were no outstanding shares of Preferred Stock.

Heat had 50,000,000 shares of common stock (par value $0.0002) authorized as of December 31, 2015 and 2014. Of the 50,000,000 common stock shares, 8,424,641 and 6,492,622 were issued and outstanding as of December 31, 2015 and 2014, respectively.

Preferred Stock

Series A, Series B-1, and Series B-2

Automatic Conversion

Each share of Preferred Stock automatically converts to common stock upon the earlier to occur of (i) on the date of consummation of a sale of common stock in a firm commitment underwritten public offering resulting in aggregate net cash proceeds to the Company (after deducting applicable underwriting discounts and commissions) of at least $15 million net proceeds; (ii) with respect to the Series A Preferred Stock, if 2/3 of the Series A Preferred Stock holders (including one of the larger investors so long as they hold 40% of the Series A Preferred Stock) vote in favor of a conversion then the Series A will automatically convert to common stock; and (iii) with respect to the Series B Preferred Stock if 2/3 of the Series B Preferred Stock holders vote in favor of a conversion then the Series B will automatically convert to common stock. As a result of the IPO, all outstanding shares of preferred stock were automatically converted to common stock.

Optional Conversion

The preferred stock is convertible into common stock at the option of the holder at any time. The conversion ratio for each share of the Series A Preferred Stock was its Original Issue Price ($2.10 for each share of the Series A Preferred Stock) divided by its Conversion Price, as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like, which Conversion Price initially was the Original Issue Price. The conversion ratio for each share of the Series B-1 Preferred Stock and the Series B-2 Preferred Stock was its Original Issue Price ($2.67 and $5.00 for each share of the Series B-1 Preferred Stock and Series B-2 Preferred Stock, respectively) plus accrued but unpaid dividends thereon divided by its conversion price, as adjusted for stock splits, stock dividends, reorganizations, recapitalizations and the like, which conversion price initially was the Original Issue Price. As a result of the 1-for-2.3 reverse stock split, the conversion ratio for the Preferred Stock was 0.4348.

In the event the Company at any time or from time to time after the Initial Series B Issuance Date shall issue additional shares of common stock without consideration or for consideration per share less than the Series A Conversion Price, Series B-1 Conversion Price, or Series B-2 Conversion Price, in effect on the date of and immediately prior to such issue, then the Series A Conversion Price, the Series B-1 Conversion Price, Series B-2 Conversion Price, shall be reduced, to a price determined by multiplying the Series A Conversion Price, the Series B-1 Conversion Price, or the Series B-2 Conversion Price in effect by a fraction, (A) the numerator of which shall be the number of shares of common stock outstanding immediately prior to such issuance, on a fully-diluted basis, plus the number of shares of common stock which the aggregate consideration received by the Company for the total number of Additional Shares of Common Stock so issued would purchase at the Series A Conversion Price, the Series B-1 Conversion Price, or the Series B-2 Conversion Price, as in effect immediately prior to such issuance, and (B) the denominator of which shall be the number of shares of common stock outstanding immediately prior to such issuance, on a fully-diluted basis, plus the number of such Additional Shares of common stock so issued. As a result of the IPO, all outstanding shares of preferred stock were automatically converted to common stock.

The preferred stock was determined to have characteristics more akin to equity than debt. Particularly, the preferred stock had no mandatory redemption provision nor was it redeemable at the option of the holder. As a result, the conversion option was determined to be clearly and closely related to the preferred stock and therefore did not need to be bifurcated and classified as a liability.

Dividends

The Series B Preferred Stock has a priority with respect to dividend distributions and distributions upon liquidation. The Series B Preferred Stock receive dividends when and as and if declared by the Board at a rate of 5% of their original issue price of such shares which is $6.14 per share for the Series B-1 Preferred Stock and $11.50 per share for the Series B-2 Preferred Stock. If the Company declares or pays a dividend upon the common stock, they must also pay to the holders of the Series A and B Preferred Stock the dividends that would have been declared with respect to common stock issuable upon conversion of the Series A and B Preferred Stock; provided, however that the Company cannot declare or pay a dividend unless and until all accrued dividends on the Series B Preferred Stock have been paid.

Liquidation

In the event of a liquidation, the holders of the Series B-1 and B-2 Preferred Stock are entitled to receive before any payment to any other Preferred Stockholder or common stock holder an amount per share equal to the greater of $6.14 for the Series B-1 Preferred Stock and $11.50 for the Series B-2 Preferred Stock plus any dividends accrued and unpaid whether or not declared. After payment in full of the Series B Preferred Stockholders the holders of the Series A Preferred Stock are entitled to receive before any payment to the common stock holder an amount per share equal to $4.83 plus any dividends declared but unpaid. After the payment in full of the amounts set forth above, the Company's assets will be distributed ratably to all holders of common stock and Series B Preferred Stock on an as converted basis except that the Series B Preferred Stockholders shall not continue to share in such distribution after each has received 3 times its Original Issue Price.

Voting Rights

Each holder of Preferred Stock is entitled to vote on all matters stockholders are entitled to vote and to cast the number of votes as shall equal the whole number of shares of common stock into which their shares of Preferred Stock are convertible.

Public Offering

On March 10, 2015, the Company entered into an Underwriting Agreement (the "Underwriting Agreement") with Aegis Capital Corp. ("Aegis"), as representative of the several underwriters named therein (the "Underwriters"), providing for the offer and sale in a firm commitment underwritten public offering (the "Offering") of 1,640,000 shares of the Company's common stock, and 246,000 additional shares of the common stock to cover over-allotments at an offering price of $6.50 per share. The net proceeds to the Company from the Offering were approximately $11.1 million, after deducting underwriting discounts, commissions, and other third party offering expenses. The Underwriting Agreement contains customary representations, warranties, and agreements by the Company, customary conditions to closing, indemnification obligations of the Company and the Underwriters, including for liabilities under the Securities Act of 1933, as amended (the "Securities Act"), other obligations of the parties and termination provisions.

Restricted Stock

As of December 31, 2015 and 2014, all restricted stock has vested. The Company recognized $78,815 and $0 in stock-based compensation expense related to vested restricted stock during the years ended December 31, 2015 and 2014, respectively.

Common Stock Warrants

In December 2011 and August 2012, the Company issued 20,549 warrants to lenders that were originally exercisable into Series A Preferred stock. The warrants had an expiration period of 10 years and converted from preferred stock warrants into warrants to purchase common stock at an exercise price of $4.83 per share upon the completion of the initial public offering in July 2013. In January and February 2014, all 20,549 warrants were exercised in cashless transactions that resulted in the issuance of 8,065 shares of common stock.

On March 10, 2011, the Company issued warrants to purchase 32,610 shares of common stock to non-employee placement agents in consideration for a private equity placement transaction. The warrants have an exercise price of $0.48 per share and expire 10 years from the issuance date. These warrants do not meet the criteria required to be classified as liability awards and therefore they are treated as equity awards. In February 2014, 15,218 warrants were exercised in cashless transactions that resulted in the issuance of 14,318 shares of common stock.

In connection with our initial public offering, the Company issued warrants to the underwriters for 125,000 shares of common stock issuable at $12.50 per share upon exercise. The warrants have a five-year life and expire on July 23, 2018. These warrants do not meet the criteria required to be classified as liability awards and therefore they are treated as equity awards.

In connection with the Loan, in August 2014, the Company issued Square 1 Bank a warrant, exercisable for 52,695 shares of the Company's common stock at an exercise price of $4.27. In September 2014, the warrants were exercised via a cashless exercise into 17,664 shares of the Company's common stock.

The following table summarizes the activity of the Company's common stock warrants.

	Common Stock Warrants
Outstanding, January 1, 2013	178,159
Granted to lenders	52,695
Exercised	(88,462)
Expired	—
Outstanding, December 31, 2014	142,392
Outstanding, December 31, 2015	142,392

The weighted average exercise price of the outstanding warrants as of December 31, 2015 is $11.03.

Equity Compensation Plan

2009 Stock Incentive Plan

In 2009, the Company adopted the 2009 Stock Option Plan of Heat Biologics, Inc. (the "2009 Plan"), under which stock options to acquire 217,391 common shares could be granted to key employees, directors, and independent contractors. Under the 2009 Plan, both incentive and non-qualified stock options could be granted under terms and conditions established by the Board of Directors. The exercise price for incentive stock options was the fair market value of the related common stock on the date the stock option was granted. Stock options granted under the 2009 Plan generally have terms of 10 years and have various vesting schedules.

The Company amended the 2009 Stock Option Plan and all related addendum agreements in April 2011. This second amendment increased the number of shares available for issuance from 217,391 to 652,174. The Company amended the 2009 Plan to increase the number of shares available for issuance to 869,565. As of December 31, 2015 and 2014, there were 553,105 and 581,842 stock options outstanding under the 2009 Plan, respectively.

2014 Stock Incentive Plan

In June 2014, the stockholders approved the 2014 Stock Option Plan of Heat Biologics, Inc. (the "2014 Plan"), under which the Company is authorized to grant 500,000 awards in the form of both incentive and non-qualified stock options, restricted stock, stock appreciation rights and other stock based awards with terms established by the Compensation Committee of the Board of Directors which has been appointed by the Board of Directors to administer the 2014 Plan. In 2015, the stockholders approved an amendment to the Plan to increase the number of shares by 600,000 that would allow the Company to grant up to 1,100,000 awards, as amended. Persons eligible to participate in the 2014 Plan include employees, directors, and consultants. Stock options granted under the 2014 Plan generally have terms of 10 years and have various vesting schedules.

As of December 31, 2015, there were 661,581 stock options outstanding under the 2014 Plan.

As of December 31, 2015, there are 453,297 stock options remaining available for grant under the Plans. The following table summarizes the components of the Company's stock-based compensation included in net loss (in thousands):

	For the years ended December 31,	
	2015	2014
Employee stock options	$ 924	$ 571
Non-employee stock options	571	495
Restricted stock awards	79	—
	$ 1,574	$ 1,066

Stock Options

The fair value of each stock option is estimated on the date of grant using the Black-Scholes-Merton option pricing model with the following assumptions for stock options granted during the years ended:

	December 31,	
	2015	2014
Dividend yield	0.0%	0.0%
Expected volatility	72.4-107.6%	107 – 110%
Risk-free interest rate	1.69-2.27%	2.06 – 2.23%
Expected lives (years)	6.25 – 10	5.9 – 6.5

The risk-free interest rate is based on U.S. Treasury interest rates at the time of the grant whose term is consistent with the expected life of the stock options. The Company used an average historical stock price volatility based on an analysis of reported data for a peer group of comparable companies that have issued stock options with substantially similar terms, as the Company had limited to no trading history for its common stock. Expected term represents the period that the Company's stock option grants are expected to be outstanding. The Company elected to utilize the "simplified" method to estimate the expected term. Under this approach, the weighted-average expected life is presumed to be the average of the vesting term and the contractual term of the option.

Expected dividend yield was considered to be 0% in the option pricing formula since the Company had not paid any dividends and had no plans to do so in the future. The forfeiture rate was considered to be none insofar as the historical experience of the Company is very limited. As required by ASC 718, the Company will adjust the estimated forfeiture rate based upon actual experience.

The Company recognized $1.6 million and $1.1 million in stock-based compensation expense for the years ended December 31, 2015 and 2014, respectively, for the Company's stock option awards.

The following tables summarize the stock option activity for the year ended December 31, 2015:

	Shares	Weighted Average Exercise Price
Outstanding, December 31, 2014	1,018,590	$ 5.04
Granted	393,375	$ 5.32
Exercised	(10,272)	$ 1.97
Forfeited	(187,007)	$ 6.53
Outstanding, December 31, 2015	1,214,686	$ 4.93

The weighted average grant-date fair value of stock options granted during the years ended December 31, 2015 and 2014 was $3.20 and $5.66, respectively.

The total fair value of stock options that vested during the year ended December 31, 2015 was approximately $2.9 million.

The following table summarizes information about stock options outstanding at December 31, 2015:

Options Outstanding			Options Vested and Exercisable		
Balance as of 12/31/2015	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price	Balance as of 12/31/2015	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price
1,214,686	7.40	$4.93	807,975	6.57	$4.44

As of December 31, 2015, the unrecognized stock-based compensation expense related to unvested stock options was approximately $2.4 million that is expected to be recognized over a weighted average period of approximately 16.7 months.

10. Income Tax

The components of income tax expense (benefit) attributable to continuing operations are as follows:

	Years ended December 31,	
	2015	2014
Current expense:		
Federal	$ —	$ —
State	—	—
Deferred expense (benefit):		
Federal	$ —	$ —
State	—	—
Total	$ —	$ —

The differences between the Company's consolidated income tax expense attributable to continuing operations and the expense computed at the 34% United States statutory income tax rate were as follows (in thousands):

	Years ended December 31,	
	2015	2014
Federal income tax expense at statutory rate	$ (7,182)	$ (4,200)
Increase (reduction) in income tax resulting from:		
State and local income taxes, net of federal benefit	(420)	(300)
Foreign rate differential	64	—
Non-deductible expenses	—	300
Prior-period true-up	(489)	(200)
Research & development credit	(171)	(500)
Stock-based compensation	194	100
Increase in valuation allowance	8,004	4,800
	$ —	$ —

The tax effects of temporary differences and operating loss carryforwards that give rise to significant portions of the deferred tax assets and deferred tax liabilities are presented below (in thousands):

	December 31,	
	2015	2014
Deferred tax assets:		
Net operating loss carryforward	$ 15,758	$ 8,142
Research & development credit	982	961
Stock-based compensation	791	467
Other	101	34
Deferred tax assets	17,632	9,604
Deferred tax liabilities:		
Property, plant and equipment, primarily due to differences in depreciation	(40)	(16)
Deferred tax liabilities:	(40)	(16)
Valuation allowance	(17,592)	(9,588)
Net deferred income taxes	$ —	$ —

At December 31, 2015 and December 31, 2014, the Company evaluated all significant available positive and negative evidence, including the existence of losses in recent years and management's forecast of future taxable income, and, as a result, determined it was more likely than not that federal and state deferred tax assets, including benefits related to net operating loss carryforwards, would not be realized. The valuation allowance was increased from $9.6 million at December 31, 2014 to $17.6 million at December 31, 2015. The increase in valuation allowance was due primarily to the increase in net operating loss carryforwards.

At December 31, 2015, the Company has federal net operating loss carryforwards of approximately $42.1 million, which are available to offset future taxable income. The federal net operating loss carryforwards begin to expire in 2029. The Company has various state net operating loss carryforwards totaling approximately $39.2 million, which are available to offset future state taxable income. State net operating losses begin to expire in 2029. The Company has various foreign net operating loss carryforwards of approximately $1.4 million. The foreign net operating loss carryforwards are carried forward indefinitely. Because the Company has incurred cumulative net operating losses since inception, all tax years remain open to examination by U.S. federal, state, and foreign income tax authorities.

In accordance with FASB ASC 740,*Accounting for Income Taxes*, the Company reflects in the consolidated financial statements the benefit of positions taken in a previously filed tax return or expected to be taken in a future tax return only when it is considered 'more-likely-than-not' that the position taken will be sustained by a taxing authority. As of December 31, 2015 and 2014, the Company had no unrecognized income tax benefits and correspondingly there is no impact on the Company's effective income tax rate associated with these items. The Company's policy for recording interest and penalties relating to uncertain income tax positions is to record them as a component of income tax expense in the accompanying statements of operations. As of December 31, 2015 and 2014, the Company had no such accruals.

The Company files income tax returns in the United States and various state and foreign jurisdictions. The Company is subject to examination by taxing authorities for the tax years ended December 31, 2008 through 2014.

11. Related Party Transactions

A member of the Company's management was paid $0 and $28,000 in consulting fees for the years ended December 31, 2015 and 2014, respectively.

The Company compensates its board members. Board members received between $40,000 and $43,750 and between $32,000 and $37,000 for services rendered during 2015 and 2014, respectively.

The Company had a related party payable balance of $0 and $26,750 as of December 31, 2015 and 2014, respectively.

The Company had a related party receivable balance of $58,017 and $48,642 as of December 31, 2015 and 2014, respectively.

12. Net Loss Per Share

Basic net loss per common share is computed by dividing net loss applicable to common stockholders by the weighted-average number of common shares outstanding during the periods. Fully diluted net loss per common share is computed using the weighted average number of common and dilutive common equivalent shares outstanding during the periods. Common equivalent shares consist of stock options and warrants that are computed using the treasury stock method.

For the years ended December 31, 2015 and 2014, all of the Company's common stock options and warrants are anti-dilutive and therefore have been excluded from the diluted calculation.

The following table reconciles net loss to net loss applicable to Heat Biologics, Inc. (in thousands, except share and per share data):

	For the years ended December 31,	
	2015	2014
Net loss	$ (21,122)	$ (12,243)
Net loss: Non-controlling interest	(827)	(454)
Net loss applicable to Heat Biologics, Inc.	$ (20,295)	$ (11,789)
Weighted-average number of common shares used in net loss per share applicable to Heat Biologics, Inc —basic and diluted	8,015,687	6,454,866
Net loss per share applicable to Heat Biologics, Inc —basic and diluted	$ (2.53)	$ (1.83)

The following potentially dilutive securities were excluded from the calculation of diluted net loss per share due to their anti-dilutive effect:

	For the years ended December 31,	
	2015	2014
Outstanding stock options	1,214,686	1,018,590
Common stock warrants	142,392	142,392

13. Commitments and Contingencies

On January 24, 2014 the Company entered into a five-year lease for 5,303 square feet of office and laboratory space for monthly rent of $10,341 exclusive of payments required for maintenance of common areas and utilities. On September 30, 2014 the lease was amended to expand the premises by an additional 676 square feet for a total of 5,979 square feet at a monthly rent of $11,638. The Company believes that such facilities are adequate for our current operations, and that there are spaces available sufficient for any future expansion requirements should the need arise. Rent expense was $0.2 million and $0.1 million, for the years ended December 31, 2015 and 2014, respectively. The Company's approximate future minimum payments for its operating lease obligations that have initial remaining non-cancelable terms in excess of one year are as follows (in thousands):

Years ending December 31,	
2016	$ 231
2017	238
2018	245
2019	193
Thereafter	—
Total	$ 907

Shares of Common Stock
Warrants to Purchase Up to Shares of Common Stock

PROSPECTUS

Sole Book-Running Manager
Roth Capital Partners

Lead Manager
Aegis Capital Corp

, 2016

PART II - INFORMATION NOT REQUIRED IN PROSPECTUS

ITEM 13. OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION

We estimate that expenses in connection with the distribution described in this registration statement (other than brokerage commissions, discounts or other expenses relating to the sale of the shares of common stock being registered in this registration statement) will be as set forth below. We will pay all of the expenses with respect to the distribution, and such amounts, with the exception of the SEC registration fee and the Financial Industry Regulatory Authority, Inc. ("FINRA") filing fee, are estimates.

SEC registration fee	$ 1,448
FINRA filing fee	2,657
Accounting fees and expenses	50,000
Legal fees and expenses	175,000
Underwriter out-of-pocket expenses	60,000
Miscellaneous	35,895
Total	$ 325,000

ITEM 14. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Section 145 of the Delaware General Corporation Law authorizes a court to award, or a corporation's board of directors to grant, indemnity to directors and officers in terms sufficiently broad to permit such indemnification under certain circumstances for liabilities, including reimbursement for expenses incurred, arising under the Securities Act of 1933, as amended (the "Securities Act").

Our amended and restated certificate of incorporation provides for indemnification of our directors and executive officers to the maximum extent permitted by the Delaware General Corporation Law, and our amended and restated bylaws provide for indemnification of our directors and executive officers to the maximum extent permitted by the Delaware General Corporation Law.

In any underwriting agreement we enter into in connection with the sale of common stock being registered hereby, the underwriters will agree to indemnify, under certain conditions, us, our directors, our officers and persons who control us, within the meaning of the Securities Act, against certain liabilities.

ITEM 15. RECENT SALES OF UNREGISTERED SECURITIES

The following information sets forth certain information with respect to all securities which we have sold during the last three years.

In April and May 2013, we issued options exercisable for an aggregate of 72,496 shares of common stock at an exercise price of $8.81 to 8 individuals for services rendered. These issuances were deemed to be exempt from registration under the Securities Act in reliance upon Section 4(a)(2) of the Securities Act of 1933, as amended (the "Securities Act") (or Regulation D promulgated thereunder), or Rule 701 promulgated under Section 3(b) of the Securities Act as transactions by an issuer not involving any public offering or pursuant to benefit plans and contracts relating to compensation as provided under Rule 701.

Upon the closing of the IPO in July 2013, all shares of our then-outstanding preferred stock automatically converted into an aggregate of 1,696,683 shares of common stock. The issuance qualified for exemption under Section 3(a)(9) of the Securities Act.

We also issued in July 2013, in connection with the IPO, an additional 36,167 shares of our common stock to the Series B Preferred Stockholders and our obligation to issue and their obligation to purchase, Series B-2 Preferred Stock, under the Stock Purchase Agreement we entered into with them was terminated. These issuances were deemed to be exempt from registration under the Securities Act in reliance upon Section 4(a)(2) of the Securities Act (or Regulation D promulgated thereunder).

On or about August 25, 2014, the Company issued to Square 1 Bank a Warrant exercisable for 52,695 shares of its common stock. The Warrant is exercisable for a period of ten years at an exercise price of $4.27. The Warrant was offered and sold in reliance on the exemption from registration afforded by Section 4(a)(2) under the Securities Act and corresponding provisions of state securities laws, which exempt transactions by an issuer not involving any public offering with an "accredited investor" as such term is defined in Regulation D promulgated under the Securities Act.

On March 3, 2015, we issued 10,000 shares of our common stock to an investor relations firm as partial consideration for services rendered pursuant to the terms of an agreement that we entered into with such firm. These shares were issued upon the exemption from the registration provisions of the Securities Act provided for by Section 4(a)(2) thereof for transactions not involving a public offering.

On April 30, 2015, we issued 10,000 shares of our common stock to an investor relations firm, as partial consideration for services rendered pursuant to the terms of an agreement that we entered into with such firm. These shares were issued upon the exemption from the registration provisions of the Securities Act provided for by Section 4(a)(2) thereof for transactions not involving a public offering.

On August 30, 2015, we issued 10,000 shares of our common stock to an investor relations firm, as partial consideration for services rendered pursuant to the terms of an agreement that we entered into with such firm. These shares were issued upon the exemption from the registration provisions of the Securities Act provided for by Section 4(a)(2) thereof for transactions not involving a public offering.

ITEM 16. EXHIBITS

Exhibit No.	Description
1.1	Form of Underwriting Agreement (1)
1.2	Form of Underwriting Agreement with Roth *
3.1	Certificate of Incorporation filed on June 10, 2008(4)
3.2	Amended and Restated Bylaws, as currently in effect(4)
3.3	Amended and Restated Certificate of Incorporation filed on October 16, 2009(4)
3.4	Second Amended and Restated Certificate of Incorporation filed on December 16, 2011(4)
3.5	Third Amended and Restated Certificate of Incorporation, as currently in effect(4)
3.6	Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation filed on May 29, 2013(1)
4.1	2009 Stock Incentive Plan(4)##
4.2	First Amendment of the 2009 Stock Incentive Plan(4)##
4.3	Second Amendment of the 2009 Stock Incentive Plan(4)##
4.4	Third Amendment of the 2009 Stock Incentive Plan(4)##
4.5	Fourth Amendment of the 2009 Stock Incentive Plan(4)##
4.6	Warrant issued to Square 1 Bank(4)
4.7	Warrant issued to North Carolina Biotechnology Center(1)
4.8	Specimen Common Stock Certificate of Heat Biologics, Inc.(4)
4.9	Form of Stock Purchase Agreement by and among Heat Biologics, Inc. and the Series B investors (Portions of the exhibit have been omitted pursuant to a request for confidential treatment. The omitted portions have been filed with the Commission)(4)##
4.10	Form of Representative's Warrant (1)
4.11	Amendment to Stock Warrant with North Carolina Biotechnology Center(1)
4.12	2014 Stock Incentive Plan (5)##
4.13	Warrant issued to Square 1 Bank(6)
4.14	First Amendment to Loan and Security Agreement with Square 1 Bank dated June 22, 2015(16)
4.15	Form of Warrant to purchase shares of common stock*
5.1	Opinion of Counsel, Gracin & Marlow, LLP †
10.1	License Agreement (UMJ110) between the University of Miami and Heat Biologics, Inc. effective February 18, 2011 (4)**
10.2	License Agreement (97-14) between the University of Miami and its School of Medicine and Heat Biologics, Inc. effective July 11, 2008(4)**
10.3	License Agreement (143) between the University of Miami and its School of Medicine and Heat Biologics I, Inc. effective February 11, 2011(4)**
10.4	License Agreement (D-107) between the University of Miami and its School of Medicine and Heat Biologics I, Inc. effective February 18, 2011(4)**
10.5	License Agreement (SS114A) between the University of Miami and its School of Medicine and Heat Biologics I, Inc. effective February 18, 2011 (4)**
10.6	Promissory Note with North Carolina Biotechnology Center dated December 14, 2011(4)
10.7	Loan Agreement with North Carolina Biotechnology Center dated December 14, 2011(4)
10.8	Common Stock Subscription Agreement between the University of Miami and Heat Biologics I, Inc. dated July 7, 2009(4)
10.9	Employment Agreement with Jeffrey Wolf dated December 18, 2009(4)##
10.10	Amendment to Employment Agreement with Jeffrey Wolf dated as of January 1, 2011(4)##
10.11	Lease with Europa Center dated as of November 18, 2011(4)
10.12	Non-Exclusive Evaluation and Biological Material License Agreement with American Type Culture Collection effective April 12, 2011(4) **
10.13	Manufacturing Services Agreement with Lonza Walkersville, Inc. dated as of October 20, 2011(1)
10.14	Assignment and Assumption Agreement dated June 26, 2009(4)

10.15	Termination Agreement UM97-114 dated June 26, 2009(4)
10.16	Loan and Security Agreement with Square 1 Bank dated August 7, 2012(2)
10.17	Employment Agreement with Jennifer Harris dated November 3, 2011 and amendment thereto dated May 1, 2013(1)##
10.18	Amendment to License Agreement (UM97-14) dated April 29, 2009(4)
10.19	First Amendment to Loan and Security Agreement with Square 1 Bank dated November 30, 2012(4)
10.20	Second Amendment to License Agreement (UMSS-114) dated August 11, 2009(4)
10.21	Exclusive License between Heat Biologics, Inc. and the University of Michigan dated July 22, 2011(4)
10.22	1st Lease Modification Agreement dated December 19, 2012(3)
10.23	Form of Co Sale and First Refusal Agreement by and among Heat Biologics, Inc. and the Series B investors(4)
10.24	Form of Voting Agreement by and among Heat Biologics, Inc. and the Series B investors(4)
10.25	Form of Investor's Rights Agreement by and among Heat Biologics, Inc. and the Series B investors(4)
10.26	Second Amendment to Loan and Security Agreement with Square 1 Bank dated January 14, 2013(4)
10.27	Third Amendment to Loan and Security Agreement with Square 1 Bank dated February 28, 2013(4)
10.28	Fourth Amendment to Loan and Security Agreement with Square 1 Bank dated March 19, 2013(4)
10.29	Option Contract for Exclusive License between Heat Biologics, Inc. and the University of Miami dated April 1, 2013(4)
10.30	Fifth Amendment to the Loan and Security Agreement with Square 1 Bank dated April 18, 2013(4)
10.31	Employment Agreement with Matthew Czajkowski dated May 15, 2013(1)##
10.32	Form of Lock-up Agreement(1)
10.33	Form of Agreement with Series B Preferred Stockholders to amend Stock Purchase Agreement(1)
10.34	Employment Agreement, dated as of October 1, 2013, by and between Melissa Price and the Company(7)##
10.34	Employment Agreement, dated as of December 16, 2013, by and between Anil K. Goyal and the Company(8)##
10.35	Amendment to Employment Agreement, dated as of January 20, 2014 between the Company and Jeffrey Wolf(9)##
10.36	Amendment to Employment Agreement, dated as of January 20, 2014 between the Company and Melissa Price(9)##
10.37	Amendment to Employment Agreement, dated as of January 20, 2014 between the Company and Matthew Czajkowski(9)##
10.38	Employment Agreement, dated as of March 3, 2014 between the Company and Taylor Schreiber (11)##
10.39	Lease Agreement dated January 24, 2014(21)
10.40	License Agreement (UMK-161) between the University of Miami and its School of Medicine and Heat Biologics I, Inc. effective March 4, 2014(10) **
10.41	Amendment to Employment Agreement dated May 7, 2014, between the Company and Matthew Czajkowski(12)##
10.42	Loan and Security Agreement dated August 22, 2014 by and between Square 1 Bank, the Company and Heat Biologics I, Inc., Heat Biologics III, Inc. and Heat Biologics IV, Inc.(13)
10.43	Amendment to Employment Agreement dated January 12, 2015 between the Company and Melissa Price(14)##
10.44	Amendment to Employment Agreement dated January 12, 2015 between the Company and Anil Goyal(14)##
10.45	Amendment to Employment Agreement dated January 12, 2015 between the Company and Taylor Schreiber(14)##
10.46	Severance Agreement, dated as of March 9, 2015 with Matthew Czajkowski (15)
10.47	First Amendment to Lease dated January 24, 2014(21)
10.48	Second Amendment to Lease dated January 24, 2014(21)
10.49	Amendment to Employment Agreement between the Company and Taylor Schreiber, M.D., Ph.D., dated July 23, 2015(17)
10.50	Amendment to Employment Agreement between the Company and Melissa Price, Ph.D., dated July 23, 2015(17)
10.51	Amended and Restated Heat Biologics, Inc. 2014 Stock Incentive Plan(18)
10.52	Form of Incentive Stock Option Agreement under the 2014 Stock Incentive Plan, as amended(17)
10.53	Form of Non-Statutory Stock Option Agreement under the 2014 Stock Incentive Plan, as amended(17)
10.54	Employment Agreement, dated as of November 30, 2015 between the Company and Timothy Creech(19)
10.55	Amendment to Employment Agreement between the Company and Jeffrey Wolf, dated January 11, 2016(20)
10.56	Amendment to Employment Agreement between the Company and Melissa Price, dated January 11, 2016(20)
10.57	Amendment to Employment Agreement between the Company and Taylor Schreiber, dated January 11, 2016(20)
10.58	Amendment to Employment Agreement between the Company and Anil Goyal dated January 11, 2016(20)
10.59	Amendment to Employment Agreement between the Company and Timothy Creech dated January 11, 2016(20)
10.60	Second Amendment to Loan and Security Agreement with Pacific Western Bank (formerly Square 1 Bank) dated February 29, 2016 (23)
21.1	List of Subsidiaries(22)
23.1	Consent of Independent Registered Public Accounting Firm (BDO USA, LLP)*
23.2	Consent of Gracin & Marlow, LLP (included in its opinion filed as Exhibit 5.1) †
24.1	Power of Attorney (included on the signature page of the original filing of this Registration Statement)
101.INS	XBRL Instance Document ***
101.SCH	XBRL Taxonomy Extension Schema Document ***
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document ***
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document ***

101.LAB XBRL Taxonomy Extension Label Linkbase Document ***
101.PRE XBRL Taxonomy Extension Presentation Linkbase Document ***

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(1) Previously filed as an exhibit to the Registration Statement on Form S-1 with the Securities and Exchange Commission on May 30, 2013 (File No. 333-188365).
(2) Previously filed as an exhibit to the Registration Statement on Form S-3 filed with the Securities and Exchange Commission on October 10, 2014 (File No. 333-199274)
(3) Previously filed as an exhibit to the Current Report on Form 8-K filed with the Securities and Exchange Commission on March 13, 2014 (File No. 001-35994).
(4) Previously filed as an exhibit to the Registration Statement on Form S-1 with the Securities and Exchange Commission on May 6, 2013 (File No. 333-188365).
(5) Previously filed as an exhibit to the Registration Statement on Form S-8 with the Securities and Exchange Commission on June 13, 2014 (File No. 333-196763)
(6) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on August 15, 2014 (File No. 001-35994).
(7) Previously filed as an exhibit to the Registration Statement on Form 8-K with the Securities and Exchange Commission on October 1, 2013 (File No. 001-35994).
(8) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on December 19, 2013 (File No. 001-35994).
(9) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on January 21, 2014(File No. 001-35994).
(10) Previously filed as an exhibit to the Annual Report on Form 10-K with the Securities and Exchange Commission on March 31, 2014(File No. 001-35994).
(11) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on March 5, 2014(File No. 001-35994).
(12) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on May 7, 2014 File No. 001-35994).
(13) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on August 25, 2014 File No. 001-35994).
(14) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on January 16, 2015 (File No. 001-35994).
(15) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on March 10, 2015 (File No. 001-35994).
(16) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on June 24, 2015 (File No. 001-35994).
(17) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on July 27, 2015 (File No. 001-35994).
(18) Previously filed as Appendix A to the Definitive Proxy Statement on Schedule 14A filed with the Securities and Exchange Commission on June 22, 2015 (File No. 001-35994).
(19) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on December 1, 2015 (File No. 001-35994).
(20) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on January 15, 2016 (File No. 001-35994).
(21) Previously filed as an exhibit to the Annual Report on Form 10-K with the Securities and Exchange Commission on March 27, 2015 (File No. 001-35994).
(22) Previously filed as an exhibit to the Annual Report on Form 10-K with the Securities and Exchange Commission on February 18, 2016 (File No. 001-35994).
(23) Previously filed as an exhibit to the Current Report on Form 8-K with the Securities and Exchange Commission on March 3, 2016 (File No. 001-35994).

* Filed herewith.
† To be filed by amendment.
Management contract or compensatory plan or arrangement required to be identified pursuant to Item 15(a)(3) of this report.
** Confidential treatment has been requested as to certain portions of this exhibit pursuant to Rule 24b-2 of the Securities Exchange Act of 1934, as amended.
*** Previously filed.

ITEM 17. UNDERTAKINGS

(a) The undersigned registrant hereby undertakes:

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

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

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement.

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

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

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

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

The undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424 (§230.424 of this chapter);

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

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

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

(f) The undersigned registrant hereby undertakes to provide to the underwriter at the closing specified in the underwriting agreements certificates in such denominations and registered in such names as required by the underwriter to permit prompt delivery to each purchaser.

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

(i) The undersigned registrant hereby undertakes that:

(1) For purposes of determining any liability under the Securities Act of 1933, the information omitted from the form of prospectus filed as part of this registration statement in reliance upon Rule 430A and contained in a form of prospectus filed by the registrant pursuant to Rule 424(b)(1) or (4) or 497(h) under the Securities Act shall be deemed to be part of this registration statement as of the time it was declared effective.

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

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the Registrant has duly caused this Amendment No. 3 to Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Durham, State of North Carolina, March 9, 2016.

HEAT BIOLOGICS, INC.

By: */s/ Jeffrey Wolf*
Name: Jeffrey Wolf
Title: Chairman and Chief Executive Officer

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

Signature	Title	Date
/s/ Jeffrey Wolf Jeffrey Wolf	Chief Executive Officer, President and Chairman (Principal Executive Officer)	March 9, 2016
/s/ Timothy Creech Timothy Creech	Chief Financial Officer (Principal Financial and Accounting Officer)	March 9, 2016
* John Monahan, Ph.D.	Director	March 9, 2016
* Michael Kharitonov, Ph.D.	Director	March 9, 2016
* Louis C. Bock	Director	March 9, 2016
* Paul Belsky, MD	Director	March 9, 2016
* Edward B. Smith	Director	March 9, 2016

*By: /s/ Jeffrey Wolf
Jeffrey Wolf
Attorney-in-Fact

EXHIBIT 1.2

HEAT BIOLOGICS, INC.

[●] Shares of Common Stock
and
Warrants to Purchase Up to [●] Shares of Common Stock

UNDERWRITING AGREEMENT

March [●], 2016

Roth Capital Partners, LLC

888 San Clemente Drive

Newport Beach, CA 92660

As the Representative of the Several Underwriters
Named on Schedule I hereto

Ladies and Gentlemen:

Heat Biologics, Inc., a Delaware corporation (the "Company"), proposes, subject to the terms and conditions stated herein, to issue and sell to the underwriters named in **Schedule I** hereto (the "Underwriters," or each, an "Underwriter"), for whom Roth Capital Partners, LLC is acting as the representative (the "Representative"), an aggregate of [●] shares (the "Shares") of common stock, par value $0.0002 per share (the "Common Stock"), of the Company and warrants (the "Warrants") to purchase up to [●] shares of Common Stock (the "Warrant Shares") at an exercise price of $[●] per share. Each Share is being sold together with [●] of a Warrant to purchase one Warrant shares. The Shares, the Warrants and the Warrant Shares are collectively referred to as the "Securities".

The Company and the several Underwriters hereby confirm their agreement as follows:

1.

Registration Statement and Prospectus. The Company has prepared and filed with the Securities and Exchange Commission (the "Commission") a registration statement covering the Securities on Form S-1 (File No. 333-209079) under the Securities Act of 1933, as amended (the "Securities Act"), and the rules and regulations (the "Rules and Regulations") of the Commission thereunder, and such amendments to such registration statement (including post effective amendments) as may have been required to the date of this Agreement. Such registration statement, as amended (including any post effective amendments), has been declared effective by the Commission. Such registration statement, including amendments thereto (including post effective amendments thereto) at the time of effectiveness thereof (the "Effective Time"), the exhibits and any schedules thereto at the Effective Time or thereafter during the period of effectiveness and the documents and information otherwise deemed to be a part thereof or included therein by the Securities Act or otherwise pursuant to the Rules and Regulations at the Effective Time or thereafter during the period of effectiveness, is herein called the

"Registration Statement." If the Company has filed or files an abbreviated registration statement pursuant to Rule 462(b) under the Securities Act (the "Rule 462 Registration Statement"), then any reference herein to the term Registration Statement shall include such Rule 462 Registration Statement . Any preliminary prospectus included in the Registration Statement or filed with the Commission pursuant to Rule 424(a) under the Securities Act is hereinafter called a "Preliminary Prospectus." The Preliminary Prospectus relating to the Securities that was included in the Registration Statement immediately prior to the pricing of the offering contemplated hereby is hereinafter called the "Pricing Prospectus."

The Company is filing with the Commission pursuant to Rule 424 under the Securities Act a final prospectus relating to the Securities, which includes the information permitted to be omitted therefrom at the Effective Time by Rule 430A under the Securities Act. Such final prospectus, as so filed, is hereinafter called the "Final Prospectus." The Final Prospectus, the Pricing Prospectus and any preliminary prospectus, in the form in which they were included in the Registration Statement or filed with the Commission pursuant to Rule 424 under the Securities Act is hereinafter called a "Prospectus."

For purposes of this Agreement, all references to the Registration Statement, the Rule 462 Registration Statement, the Pricing Prospectus, the Final Prospectus, the Prospectus or any amendment or supplement to any of the foregoing shall be deemed to include the copy filed with the Commission pursuant to its Interactive Data Electronic Applications system. All references in this Agreement to amendments or supplements to the Registration Statement, the Rule 462 Registration Statement, the Pricing Prospectus, the Final Prospectus or the Prospectus shall be deemed to mean and include the subsequent filing of any document under the Securities Exchange Act of 1934, as amended (the "Exchange Act"), that is deemed to be incorporated by reference therein or otherwise deemed by the Rules and Regulations to be a part thereof.

2. Representations and Warranties of the Company Regarding the Offering.

(a) The Company represents and warrants to, and agrees with, the several Underwriters, as of the date hereof and as of the Closing Date, except as otherwise indicated, as follows:

(i) At each time of effectiveness, at the date hereof and at the Closing Date, the Registration Statement and any post-effective amendment thereto complied or will comply in all material respects with the requirements of the Securities Act and the Rules and Regulations and did not and will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading. The Time of Sale Disclosure Package (as defined in Section 2(a)(iii)(A)(1) below) as of the date hereof and at the Closing Date, any roadshow or investor presentations delivered to and approved by the Representative for use in connection with the marketing of the offering of the Securities (the "Marketing Materials") as of the time of their use and at the Closing Date, and the Prospectus, as amended or supplemented, as of its date, at the time of filing pursuant to Rule 424(b) under the Securities Act and at the Closing Date, did not and will not contain any untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in the light of the circumstances under which

they were made, not misleading. The representations and warranties set forth in the two immediately preceding sentences shall not apply to statements in or omissions from the Registration Statement, the Time of Sale Disclosure Package or any Prospectus in reliance upon, and in conformity with, written information furnished to the Company by any Underwriter specifically for use in the preparation thereof, which written information is described in Section 7(f). The Registration Statement contains all exhibits and schedules required to be filed by the Securities Act or the Rules and Regulations. No order preventing or suspending the effectiveness or use of the Registration Statement or any Prospectus is in effect and no proceedings for such purpose have been instituted or are pending, or, to the knowledge of the Company, are contemplated or threatened by the Commission.

(ii) The Company has not distributed any prospectus or other offering material in connection with the offering and sale of the Securities other than the Time of Sale Disclosure Package and the Marketing Materials.

(iii) (A) The Company has provided a copy to the Underwriters of each Issuer Free Writing Prospectus (as defined below) used in the sale of the Securities. The Company has filed all Issuer Free Writing Prospectuses required to be so filed with the Commission, and no order preventing or suspending the effectiveness or use of any Issuer Free Writing Prospectus is in effect and no proceedings for such purpose have been instituted or are pending, or, to the knowledge of the Company, are contemplated or threatened by the Commission. When taken together with the rest of the Time of Sale Disclosure Package or the Final Prospectus, since its first use and at all relevant times since then, no Issuer Free Writing Prospectus has, does or will include (1) any untrue statement of a material fact or omission to state any material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading, or (2) information that conflicted, conflicts or will conflict with the information contained in the Registration Statement or the Final Prospectus. The representations and warranties set forth in the immediately preceding sentence shall not apply to statements in or omissions from the Time of Sale Disclosure Package, the Final Prospectus or any Issuer Free Writing Prospectus in reliance upon, and in conformity with, written information furnished to the Company by any Underwriter specifically for use in the preparation thereof. As used in this paragraph and elsewhere in this Agreement:

(1) "Time of Sale Disclosure Package" means the Pricing Prospectus, each Issuer Free Writing Prospectus, and the description of the transaction provided by the Underwriters included on **Schedule II**.

(2) "Issuer Free Writing Prospectus" means any "issuer free writing prospectus," as defined in Rule 433 under the Securities Act, relating to the Securities that (A) is required to be filed with the Commission by the Company, or (B) is exempt from filing pursuant to Rule 433(d)(5)(i) or (d)(8) under the Securities Act, in each case in the form filed or required to be filed with the Commission or, if not required to be filed, in the form retained in the Company's records pursuant to Rule 433(g) under the Securities Act.

(B) At the time of filing of the Registration Statement and at the date hereof, the Company was not and is not an "ineligible issuer," as defined in Rule 405 under the Securities Act or an "excluded issuer" as defined in Rule 164 under the Securities Act.

(C) Each Issuer Free Writing Prospectus satisfied, as of its issue date and at all subsequent times through the Prospectus Delivery Period (as defined below in Section 5(a)(ii)), all other conditions as may be applicable to its use as set forth in Rules 164 and 433 under the Securities Act, including any legend, record-keeping or other requirements.

(iv) The financial statements of the Company, together with the related notes, included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Final Prospectus comply in all material respects with the applicable requirements of the Securities Act, the Exchange Act and the Rules and Regulations and fairly present the financial condition of the Company as of the dates indicated and the results of operations and changes in cash flows for the periods therein specified in conformity with U.S. generally accepted accounting principles consistently applied throughout the periods involved; and the supporting schedules included in the Registration Statement present fairly the information required to be stated therein. The pro forma and pro forma as adjusted financial information, if any, included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Final Prospectus has been properly compiled and prepared in all material respects in accordance with the applicable requirements of the Securities Act, the Exchange Act and the Rules and Regulations and include all adjustments necessary to present fairly, in accordance with U.S. generally accepted accounting principles, the pro forma and pro forma as adjusted financial position of the respective entity or entities presented therein, if any, at the respective dates indicated and their cash flows and the results of operations for the respective periods specified. The assumptions used in preparing the pro forma and pro forma as adjusted financial information included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Final Prospectus, if any, provide a reasonable basis for presenting the significant effects directly attributable to the transactions or events described therein. The related pro forma and pro forma as adjusted adjustments, if any, give appropriate effect to those assumptions, and the pro forma and pro forma as adjusted financial information, if any, reflect the proper application of those adjustments to the corresponding historical financial statement amounts. No other financial statements, pro forma financial information or schedules are required under the Securities Act to be included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package or the Final Prospectus.

(v) To the Company's knowledge, BDO USA LLP, which has expressed its opinion with respect to the financial statements and schedules included in or incorporated by reference as a part of the Registration Statement and included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure

Package and the Final Prospectus, is an independent public accounting firm with respect to the Company within the meaning of the Securities Act and the Rules and Regulations.

(vi) The Company had a reasonable basis for, and made in good faith, each "forward-looking statement" (within the meaning of Section 27A of the Securities Act or Section 21E of the Exchange Act) contained or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package, the Final Prospectus or the Marketing Materials, in each case at the time such "forward-looking statement" was made.

(vii) All statistical or market-related data included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package or the Final Prospectus, or included in the Marketing Materials are based on or derived from sources that the Company reasonably believes to be reliable and accurate, and the Company has obtained the written consent to the use of such data from such sources, to the extent required.

(viii) The Common Stock is registered pursuant to Section 12(b) of the Exchange Act and is listed on the NASDAQ Capital Market. Except as disclosed in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, there is no action pending by the Company or, to the Company's knowledge, by the NASDAQ Capital Market to delist the Common Stock from the NASDAQ Capital Market, nor has the Company received any notification that the NASDAQ Capital Market is contemplating terminating such listing. The Company has submitted a Notification Form: Listing of Additional Shares with the NASDAQ Capital Market with respect to the Shares and the Warrant Shares.

(ix) The Company has not taken, directly or indirectly, any action that is designed to or that has constituted or that would reasonably be expected to cause or result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Securities.

(x) The Company is not and, after giving effect to the offering and sale of the Securities and the application of the net proceeds thereof, including the proceeds received upon the exercise of the Warrants, will not be an "investment company," as such term is defined in the Investment Company Act of 1940, as amended.

(b) Any certificate signed by any officer of the Company and delivered to the Underwriters or to the Underwriters' counsel shall be deemed a representation and warranty by the Company to the Underwriters as to the matters covered thereby.

3. Representations and Warranties Regarding the Company.

(a) The Company represents and warrants to and agrees with, the several Underwriters, as of the date hereof and as of the Closing Date (as defined in Section 4(b) below), except as set forth in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, as follows:

(i) Each of the Company and its subsidiaries has been duly organized and is validly existing as a corporation or other entity in good standing under the laws of its jurisdiction of organization. Each of the Company and its subsidiaries has the power and authority (corporate or otherwise) to own its properties and conduct its business as currently being carried on and as described in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, and is duly qualified to do business as a foreign corporation or other entity in good standing in each jurisdiction in which it owns or leases real property or in which the conduct of its business makes such qualification necessary, except where the failure to so qualify would not have or reasonably be likely to result in a material adverse effect upon the business, prospects, properties, operations, condition (financial or otherwise) or results of operations of the Company and its subsidiaries, taken as a whole, or in its ability to perform its obligations under this Agreement ("Material Adverse Effect"). The Company's subsidiaries are listed on **Schedule III** attached hereto.

(ii) The Company has the power and authority to enter into this Agreement and the Warrants and to authorize, issue and sell the Securities as contemplated by this Agreement. This Agreement and the Warrants have been duly and validly authorized by the Company and when executed and delivered by the Company, will constitute the valid, legal and binding obligations of the Company, enforceable against the Company in accordance with their respective terms, except as rights to indemnity hereunder may be limited by federal or state securities laws and except as such enforceability may be limited by bankruptcy, insolvency, reorganization or similar laws affecting the rights of creditors generally and subject to general principles of equity.

(iii) The execution, delivery and performance of this Agreement and the Warrants by the Company and the consummation by the Company of the transactions herein and therein contemplated will not (A) result in a breach or violation of any of the terms and provisions of, or constitute a default under, any law, order, rule or regulation to which the Company or any subsidiary is subject, or by which any property or asset of the Company or any subsidiary is bound or affected, except to the extent such breach, violation or default is not reasonably likely to have a Material Adverse Effect, (B) conflict with, result in any violation or breach of, or constitute a default (or an event that with notice or lapse of time or both would become a default) under, or give to others any right of termination, amendment, acceleration or cancellation (with or without notice, lapse of time or both) (a "Default Acceleration Event") of, any agreement, lease, credit facility, debt, note, bond, mortgage, indenture or other instrument (the "Contracts") or obligation or other understanding to which the Company or any subsidiary is a party or by which any property or asset of the Company or any subsidiary is bound or affected, except to the extent that such conflict, default or Default Acceleration Event is not reasonably likely to result in a Material Adverse Effect, or (C) result in a breach or violation of any of the terms and provisions of, or constitute a default under, the Company's Certificate of Incorporation, as amended, or by-laws, as amended.

(iv) Neither the Company nor any of its subsidiaries is in violation, breach or default under its Certificate of Incorporation, as amended, by-laws, as amended, or other equivalent organizational or governing documents, except where the

violation, breach or default in the case of a subsidiary of the Company is not reasonably likely to result in a Material Adverse Effect.

(v) No consents, approvals, orders, authorizations or filings are required on the part of the Company and its subsidiaries in connection with the execution, delivery or performance of this Agreement and the Warrants and the issue and sale of the Securities, except (A) the registration under the Securities Act of the Securities, (B) such consents, approvals, authorizations, registrations or qualifications as may be required under state or foreign securities or Blue Sky laws and the rules of the Financial Industry Regulatory Authority, Inc. ("FINRA") in connection with the purchase and distribution of the Securities by the several Underwriters, (C) the necessary filings and approvals from the NASDAQ Capital Market to list the Shares and the Warrant Shares, and (D) such consents, approvals, orders, authorizations and filings the failure of which to make or obtain is not reasonably likely to result in a Material Adverse Effect.

(vi) The Company has an authorized capitalization as set forth in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus. All of the issued and outstanding shares of capital stock of the Company are duly authorized and validly issued, fully paid and nonassessable, and have been issued in compliance with all applicable securities laws, and conform to the description thereof in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus. All of the issued shares of capital stock of each subsidiary of the Company have been duly and validly authorized and issued, are fully paid and non-assessable and, except as set forth in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, are owned directly or indirectly by the Company, free and clear of all liens, encumbrances, equities or claims. Except for the issuances of options or restricted stock in the ordinary course of business, since the respective dates as of which information is provided in the Registration Statement, the Time of Sale Disclosure Package or the Prospectus, the Company has not entered into or granted any convertible or exchangeable securities, options, warrants, agreements, contracts or other rights in existence to purchase or acquire from the Company any shares of the capital stock of the Company. The Shares and the Warrants, when issued, will be duly authorized and validly issued, fully paid and nonassessable, will be issued in compliance with all applicable securities laws and will be free of preemptive, registration or similar rights. The Warrant Shares, when issued, paid for and delivered upon due exercise of the Warrants, will be duly authorized and validly issued, fully paid and nonassessable, will be issued in compliance with all applicable securities laws, and will be free of preemptive, registration or similar rights. The Warrant Shares have been reserved for issuance. The Securities, when issued, will conform in all material respects to the descriptions thereof set forth in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus.

(vii) Each of the Company and its subsidiaries has (A) filed all returns (as hereinafter defined) required to be filed with taxing authorities prior to the date hereof or has duly obtained extensions of time for the filing thereof and (B) paid all taxes (as hereinafter defined) shown as due on such returns that were filed and has paid all taxes imposed on or assessed against the Company or such respective subsidiary, except, in all cases, for any such amounts that the Company or any subsidiary is contesting in good

faith and for which appropriate reserves have been established on the books of the Company or such subsidiary. The provisions for taxes payable, if any, shown on the financial statements filed with or as part of the Registration Statement are sufficient for all accrued and unpaid taxes, whether or not disputed, and for all periods to and including the dates of such consolidated financial statements. No issues have been raised and are currently pending by any taxing authority in connection with any of the returns or taxes asserted as due from the Company or its subsidiaries, and no waivers of statutes of limitation with respect to the returns or collection of taxes have been given by or requested from the Company or its subsidiaries. The term "taxes" mean all federal, state, local, foreign, and other net income, gross income, gross receipts, sales, use, ad valorem, transfer, franchise, profits, license, lease, service, service use, withholding, payroll, employment, excise, severance, stamp, occupation, premium, property, windfall profits, customs, duties or other taxes, fees, assessments, or charges of any kind whatever, together with any interest and any penalties, additions to tax, or additional amounts with respect thereto. The term "returns" means all returns, declarations, reports, statements, and other documents required to be filed in respect to taxes.

(viii) Since the respective dates as of which information is given in the Registration Statement, the Time of Sale Disclosure Package or the Prospectus, (a) neither the Company nor any of its subsidiaries has incurred any material liabilities or obligations, direct or contingent, or entered into any material transactions other than in the ordinary course of business, (b) the Company has not declared or paid any dividends or made any distribution of any kind with respect to its capital stock, (c) there has not been any change in the capital stock of the Company or any of its subsidiaries (other than a change in the number of outstanding shares of Common Stock due to the issuance of shares upon the exercise of outstanding options or warrants or the issuance of restricted stock awards or restricted stock units under the Company's existing stock awards plan , or any new grants thereof in the ordinary course of business) , (d) there has not been any material change in the Company's long-term or short-term debt, and (e) there has not been the occurrence of any Material Adverse Effect.

(ix) There is not pending or, to the knowledge of the Company, threatened, any action, suit or proceeding to which the Company or any of its subsidiaries is a party or of which any property or assets of the Company or any of its subsidiaries is the subject before or by any court or governmental agency, authority or body, or any arbitrator or mediator, which is reasonably likely to result in a Material Adverse Effect or adversely affect the consummation of the transactions contemplated by this Agreement.

(x) The Company and each of its subsidiaries holds, and is in compliance with, all franchises, grants, authorizations, licenses, permits, easements, consents, certificates and orders ("Permits") of any governmental or self-regulatory agency, authority or body (including, without limitation, those administered by the Food and Drug Administration of the U.S. Department of Health and Human Services (the "FDA") or by any foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA) required for the conduct of its business, and all such Permits are in full force and effect, in each case except where

the failure to hold, or comply with, any of them is not reasonably likely to result in a Material Adverse Effect.

(xi) The Company and its subsidiaries have good and marketable title to all property (whether real or personal) described in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus as being owned by them that is material to the business of the Company, in each case free and clear of all liens, claims, security interests, other encumbrances or defects, except those that are not reasonably likely to result in a Material Adverse Effect. The property held under lease by the Company and its subsidiaries is held by them under valid, subsisting and enforceable leases with only such exceptions with respect to any particular lease as do not interfere in any material respect with the conduct of the business of the Company and its subsidiaries.

(xii) The Company and each of its subsidiaries owns or possesses or has valid right to use all patents, patent applications, trademarks, service marks, trade names, trademark registrations, service mark registrations, copyrights, licenses, inventions, trade secrets and similar rights ("Intellectual Property") necessary for the conduct of the business of the Company and its subsidiaries as currently carried on and as described in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus. To the knowledge of the Company, no action or use by the Company or any of its subsidiaries involves or gives rise to any infringement of, or license or similar fees for, any Intellectual Property of others, except where such action, use, license or fee is not reasonably likely to result in a Material Adverse Effect. Neither the Company nor any of its subsidiaries has received any notice alleging any such infringement or fee.

(xiii) The Company and each of its subsidiaries has complied with, is not in violation of, and has not received any notice of violation relating to any law, rule or regulation relating to the conduct of its business, or the ownership or operation of its property and assets, including, without limitation, (A) the Currency and Foreign Transactions Reporting Act of 1970, as amended, or any money laundering laws, rules or regulations, (B) any laws, rules or regulations related to health, safety or the environment, including those relating to the regulation of hazardous substances, (C) the Sarbanes-Oxley Act and the rules and regulations of the Commission thereunder, (D) the Foreign Corrupt Practices Act of 1977 and the rules and regulations thereunder, and (E) the Employment Retirement Income Security Act of 1974 and the rules and regulations thereunder, in each case except where the failure to be in compliance is not reasonably likely to result in a Material Adverse Effect.

(xiv) The clinical, pre-clinical and other studies and tests conducted by or on behalf of or sponsored by the Company or its subsidiaries that are described or referred to in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus were and, if still pending, are being conducted in accordance in all material respects with all statutes, laws, rules and regulations, as applicable (including, without limitation, those administered by the FDA or by any foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA). The descriptions of the results of such studies and tests that are described or referred to in the Registration Statement, the Time of Sale Disclosure Package and the

Prospectus are accurate and complete in all material respects and fairly present the published data derived from such studies and tests, and each of the Company and its subsidiaries has no knowledge of other studies or tests the results of which are materially inconsistent with or otherwise call into question the results described or referred to in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus. Except as described in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, neither the Company nor its subsidiaries has received any notices or other correspondence from the FDA or any other foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA with respect to any ongoing clinical or pre-clinical studies or tests requiring the termination or suspension of such studies or tests. For the avoidance of doubt, the Company makes no representation or warranty that the results of any studies, tests or preclinical or clinical trials conducted by or on behalf of the Company will be sufficient to obtain governmental approval from the FDA or any foreign, state or local governmental body exercising comparable authority.

(xv) The Company has established and administers a compliance program applicable to the Company and its subsidiaries, to assist the Company, its subsidiaries and their directors, officers and employees of the Company and its subsidiaries in complying with applicable regulatory guidelines (including, without limitation, those administered by the FDA and any other foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA).

(xvi) Except as would not be reasonably expected to result in a Material Adverse Effect, neither the Company nor any of its subsidiaries has failed to file with the applicable regulatory authorities (excluding the FDA or any foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA) any filing, declaration, listing, registration, report or submission that is required to be so filed. Neither the Company nor any of its subsidiaries has failed to file with the FDA or any foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA, any filing, declaration, listing, registration, report or submission that is required to be so filed. All such filings were in material compliance with applicable laws when filed and no deficiencies have been asserted by any applicable regulatory authority (including, without limitation, the FDA or any foreign, federal, state or local governmental or regulatory authority performing functions similar to those performed by the FDA) with respect to any such filings, declarations, listings, registrations, reports or submissions.

(xvii) Neither the Company nor any of its subsidiaries nor, to the knowledge of the Company, any director, officer, employee, representative, agent or affiliate of the Company or any of its subsidiaries is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Treasury Department ("OFAC"); and the Company will not directly or indirectly use the proceeds of the offering of the Securities contemplated hereby, or lend, contribute or otherwise make available such proceeds to any person or entity, for the purpose of financing the activities of any person currently subject to any U.S. sanctions administered by OFAC.

(xviii) The Company and each of its subsidiaries carries, or is covered by, insurance in such amounts and covering such risks as is adequate for the conduct of its business and the value of its properties and as is customary for companies engaged in similar businesses in similar industries.

(xix) No labor dispute with the employees of the Company or any of its subsidiaries exists or, to the knowledge of the Company, is imminent, that is reasonably likely to result in a Material Adverse Effect.

(xx) Neither the Company, its subsidiaries nor, to its knowledge, any other party is in violation, breach or default of any Contract that is reasonably likely to result in a Material Adverse Effect.

(xxi) No supplier, customer, distributor or sales agent of the Company has notified the Company that it intends to discontinue or decrease the rate of business done with the Company, except where such decrease is not reasonably likely to result in a Material Adverse Effect.

(xxii) There are no claims, payments, issuances, arrangements or understandings for services in the nature of a finder's, consulting or origination fee with respect to the introduction of the Company to any Underwriter or the sale of the Securities hereunder or any other arrangements, agreements, understandings, payments or issuances with respect to the Company that may affect the Underwriters' compensation, as determined by FINRA.

(xxiii) Except as set forth or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, the Company has not made any direct or indirect payments (in cash, securities or otherwise) to (i) any person, as a finder's fee, investing fee or otherwise, in consideration of such person raising capital for the Company or introducing to the Company persons who provided capital to the Company, (ii) any FINRA member, or (iii) any person or entity that has any direct or indirect affiliation or association with any FINRA member within the 12-month period prior to the date on which the Registration Statement was filed with the Commission ("Filing Date") or thereafter.

(xxiv) None of the net proceeds of the offering will be paid by the Company to any participating FINRA member or any affiliate or associate of any participating FINRA member, except as specifically authorized herein.

(xxv) Except as set forth or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus and except as disclosed to the Underwriters in writing, to the Company's knowledge, no (i) officer or director of the Company or its subsidiaries, (ii) owner of 5% or more of the Company's unregistered securities or that of its subsidiaries or (iii) owner of any amount of the Company's unregistered securities acquired within the 180-day period prior to the Filing Date, has any direct or indirect affiliation or association with any FINRA member. The Company will advise the Underwriters and their counsel if it becomes aware that any

officer, director or stockholder of the Company or its subsidiaries is or becomes an affiliate or associated person of a FINRA member participating in the offering.

(xxvi) Other than the Underwriters, no person has the right to act as an underwriter or as a financial advisor to the Company in connection with the transactions contemplated hereby.

(xxvii) The statements set forth in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus under the captions "Business—Intellectual Property—License Agreements" and "Business—Government Regulation," insofar as they purport to describe the provisions of the laws and documents referred to therein, are accurate, complete and fair, and under the captions "Description of Our Securities" and "Description of Securites We are Offering" insofar as they purport to constitute a summary of the terms of the Securities and documents referred to therein, are accurate, complete and fair.

(xxviii) Except as set forth or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, there are no contracts, agreements or understandings between the Company and any person granting such person the right (other than rights which have been waived in writing or otherwise satisfied) to require the Company to file a registration statement under the Securities Act with respect to any securities of the Company owned or to be owned by such person or to require the Company to include such securities in the securities registered pursuant to the Registration Statement or in any securities being registered pursuant to any other registration statement filed by the Company under the Securities Act.

(xxix) Except as set forth or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, the Company has not sold or issued any shares of Common Stock during the six-month period preceding the date of the Prospectus, including any sales pursuant to Rule 144A under, or Regulations D or S of, the Securities Act, other than shares issued pursuant to employee benefit plans, stock option plans or other employee compensation plans or pursuant to outstanding options, rights or warrants.

(xxx) The Company and each of its subsidiaries (i) are in compliance with all, and have not violated any, laws, regulations, ordinances, rules, orders, judgments, decrees, permits or other legal requirements of any governmental authority, including without limitation any international, national, state, provincial, regional, or local authority, relating to the protection of human health or safety, the environment, or natural resources, or to hazardous or toxic substances or wastes, pollutants or contaminants (including, without limitation, all health and safety laws) ("Environmental Laws") applicable to such entity, which compliance includes, without limitation, obtaining, maintaining and complying with all permits and authorizations and approvals required by Environmental Laws to conduct their respective businesses as described in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, except where the failure to comply would not, singularly or in the aggregate, have a

Material Adverse Effect, and (ii) have not received notice of any actual or alleged violation of Environmental Laws, or of any potential liability for or other obligation concerning the presence, disposal or release of hazardous or toxic substances or wastes, pollutants or contaminants.

(A) There are no proceedings that are pending, or known to be contemplated, against the Company or any of its subsidiaries under Environmental Laws in which a governmental authority is also a party.

(B) The Company and its subsidiaries are not aware of any existing liabilities concerning hazardous or toxic substances or wastes, pollutants or contaminants that could reasonably be expected to have a Material Adverse Effect on the capital expenditures, earnings or competitive position of the Company and its subsidiaries.

(C) To the knowledge of the Company, no property which is or has been owned, leased, used, operated or occupied by the Company or its subsidiaries has been designated as a Superfund site pursuant to the Comprehensive Environmental Response, Compensation of Liability Act of 1980, as amended (42 U.S.C. Section 9601, et. seq.), or otherwise designated as a contaminated site under applicable state or local law.

(xxxi) The Company maintains a system of internal control over financial reporting (as such term is defined in Rule 13a-15(f) under the Exchange Act) that complies in all material respects with the requirements of the Exchange Act and has been designed by the Company's principal executive officer and principal financial officer, or under their supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with U.S. generally accepted accounting principles. The Company's internal control over financial reporting is effective and the Company is not aware of any material weaknesses in its internal control over financial reporting.

(xxxii) Since the date of the latest audited financial statements included or incorporated by reference in the Registration Statement, the Time of Sale Disclosure Package and the Prospectus, there has been no change in the Company's internal control over financial reporting that has materially affected, or is reasonably likely to materially affect, the Company's internal control over financial reporting.

(xxxiii) The Company maintains disclosure controls and procedures (as such term is defined in Rule 13a-15(e) under the Exchange Act) that comply with the requirements of the Exchange Act; such disclosure controls and procedures have been designed to ensure that material information relating to the Company and its subsidiaries is made known to the Company's principal executive officer and principal financial

officer by others within those entities; and such disclosure controls and procedures are effective.

(xxxiv) The operations of the Company and its subsidiaries are being conducted in material compliance with applicable employment laws, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any governmental agency (collectively, the "Employee Benefit Laws") and no action, suit or proceeding by or before any court or governmental agency, authority or body or any arbitrator involving the Company or any of its subsidiaries with respect to the Employee Benefit Laws is pending or, to the knowledge of the Company, threatened.

(xxxv) Neither the Company nor any of its subsidiaries or affiliates, nor any director, officer, or employee, nor, to the Company's knowledge, any agent or representative of the Company or of any of its subsidiaries or affiliates, has taken any action in furtherance of an offer, payment, promise to pay, or authorization or approval of the payment or giving of money, property, gifts or anything else of value, directly or indirectly, to any "government official" (including any officer or employee of a government or government-owned or controlled entity or of a public international organization, or any person acting in an official capacity for or on behalf of any of the foregoing, or any political party or party official or candidate for political office) to influence official action or secure an improper advantage; and the Company and its subsidiaries and affiliates conduct their businesses in compliance in all material respects with applicable anti-corruption laws and have instituted and maintain and will continue to maintain policies and procedures designed to promote and achieve compliance in all material respects with such laws and with the representation and warranty contained herein.

4. Purchase, Sale and Delivery of the Securities.

(a) On the basis of the representations, warranties and agreements herein contained, but subject to the terms and conditions herein set forth, the Company agrees to issue and sell the Shares and the Warrants to the several Underwriters, and the Underwriters agree, severally and not jointly, to purchase the respective numbers of Shares and Warrants set forth opposite the names of the Underwriters in **Schedule I** hereto. The purchase price shall be $[●] for each Shares and related Warrant (the "Purchase Price").

(b) The Shares and the Warrants will be delivered by the Company to the Underwriters, for their respective accounts, against payment of the purchase price therefor by wire transfer of same day funds payable to the order of the Company at the offices of Roth Capital Partners, LLC, 888 San Clemente Drive, Newport Beach, CA 92660, or such other location as may be mutually acceptable, at 6:00 a.m. Pacific time, on the third (or if the Shares and the Warrants are priced, as contemplated by Rule 15c6-1(c) under the Exchange Act, after 4:30 p.m. Eastern time, the fourth) full business day following the date hereof, or at such other time and date as the Representative and the Company determine pursuant to Rule 15c6-1(a) under the Exchange Act. The time and date of delivery of the Shares and the Warrants is referred to herein as the "Closing Date." On the Closing Date, the Company shall deliver the

Shares and the Warrants, which shall be registered in the name or names and shall be in such denominations as the Representative may request on behalf of the Underwriters at least one (1) business day before the Closing Date, to the respective accounts of the several Underwriters, which delivery shall (a) with respect to the Shares, be made through the facilities of the Depository Trust Company's DWAC system, and (b) with respect to the Warrants, be made by physical delivery to be received or directed by the Representative on behalf of the Underwriters no later than one (1) business day following the respective Closing Date.

5. Covenants.

(a) The Company covenants and agrees with the several Underwriters as follows:

(i) To prepare the Prospectus in a form approved by the Underwriters and to file such Prospectus pursuant to Rule 424(b) under the Securities Act not later than the Commission's close of business on the second business day following the execution and delivery of this Agreement, or, if applicable, such earlier time as may be required by Rule 430A(a)(3) under the Securities Act.

(ii) During the period beginning on the date hereof and ending on the date that the Prospectus is no longer required by law to be delivered in connection with sales by an underwriter or dealer (the "Prospectus Delivery Period"), prior to amending or supplementing the Registration Statement, including any Rule 462 Registration Statement, the Time of Sale Disclosure Package or the Prospectus, the Company shall furnish to the Underwriters for review and comment a copy of each such proposed amendment or supplement, and the Company shall not file any such proposed amendment or supplement to which any Underwriter reasonably objects.

(iii) From the date of this Agreement until the end of the Prospectus Delivery Period, the Company shall promptly advise the Underwriters in writing (A) of the receipt of any comments of, or requests for additional or supplemental information from, the Commission, (B) of the time and date of any filing of any post-effective amendment to the Registration Statement or any amendment or supplement to the Time of Sale Disclosure Package, the Prospectus or any Issuer Free Writing Prospectus, (C) of the time and date that any post-effective amendment to the Registration Statement becomes effective and (D) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or of any order preventing or suspending its use or the use of the Time of Sale Disclosure Package or any Issuer Free Writing Prospectus, or of any proceedings to remove, suspend or terminate from listing or quotation the Common Stock from any securities exchange upon which it is listed for trading or included or designated for quotation, or of the threatening or initiation of any proceedings for any of such purposes. If the Commission shall enter any such stop order at any time during the Prospectus Delivery Period, the Company will use its reasonable efforts to obtain the lifting of such order at the earliest possible moment. Additionally, the Company agrees that it shall comply with the provisions of Rules 424(b), 430A and 430B, as applicable, under the Securities Act and will use its reasonable efforts to confirm that any filings made by the Company under Rule 424(b) or Rule 433 were received in a timely manner by the Commission (without reliance on Rule 424(b)(8) or 164(b) of the Securities Act).

(iv) (A) During the Prospectus Delivery Period, the Company will comply with all requirements imposed upon it by the Securities Act, as now and hereafter amended, and by the Rules and Regulations, as from time to time in force, and by the Exchange Act, as now and hereafter amended, so far as necessary to permit the continuance of sales of or dealings in the Securities as contemplated by the provisions hereof, the Time of Sale Disclosure Package, the Registration Statement and the Prospectus. If during such period any event occurs, the result of which would cause the Prospectus (or if the Prospectus is not yet available to prospective purchasers, the Time of Sale Disclosure Package) to include an untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in the light of the circumstances under which such statement was made, not misleading, or if during such period it is necessary or appropriate in the opinion of the Company or its counsel or the Underwriters or their counsel to amend the Registration Statement or supplement the Prospectus (or if the Prospectus is not yet available to prospective purchasers, the Time of Sale Disclosure Package) to comply with the Securities Act, the Company will promptly notify the Underwriters, allow the Underwriters the opportunity to provide reasonable comments on such amendment, Prospectus supplement or document, and will amend the Registration Statement or supplement the Prospectus (or if the Prospectus is not yet available to prospective purchasers, the Time of Sale Disclosure Package) so as to correct such statement or omission or effect such compliance.

(B) If during the Prospectus Delivery Period there occurred or occurs an event or development the result of which is that such Issuer Free Writing Prospectus conflicted or would conflict with the information contained in the Registration Statement or any Prospectus or included or would include an untrue statement of a material fact or omitted or would omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances prevailing at that subsequent time, not misleading, the Company has promptly notified or promptly will notify the Underwriters and has promptly amended or will promptly amend or supplement, at its own expense, such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission.

(v) The Company shall take or cause to be taken all necessary action to qualify the Securities for sale under the securities laws of such jurisdictions as the Underwriters reasonably designate and to continue such qualifications in effect so long as required for the distribution of the Securities, except that the Company shall not be required in connection therewith to qualify as a foreign corporation or as a dealer in securities in any jurisdiction in which it is not so qualified, to execute a general consent to service of process in any state or to subject itself to taxation in respect of doing business in any jurisdiction in which it is not otherwise subject.

(vi) The Company will furnish to the Underwriters and counsel for the Underwriters copies of the Registration Statement, each Prospectus, any Issuer Free Writing Prospectus, and all amendments and supplements to such documents, in each case as soon as available and in such quantities as the Underwriters may from time to time reasonably request.

(vii) The Company will make generally available to its security holders as soon as practicable, but in any event not later than 15 months after the end of the Company's current fiscal quarter, an earnings statement (which need not be audited) covering a 12-month

period that shall satisfy the provisions of Section 11(a) of the Securities Act and Rule 158 of the Rules and Regulations.

(viii) The Company, whether or not the transactions contemplated hereunder are consummated or this Agreement is terminated, will pay or cause to be paid (A) all expenses (including transfer taxes allocated to the respective transferees) incurred in connection with the delivery to the Underwriters of the Securities, (B) all expenses and fees (including, without limitation, fees and expenses of the Company's counsel) in connection with the preparation, printing, filing, delivery, and shipping of the Registration Statement (including the financial statements therein and all amendments, schedules, and exhibits thereto), the Securities, the Time of Sale Disclosure Package, the Prospectus, any Issuer Free Writing Prospectus and any amendment thereof or supplement thereto, (C) all reasonable filing fees and reasonable fees and disbursements of the Underwriters' counsel incurred in connection with the qualification of the Securities for offering and sale by the Underwriters or by dealers under the securities or blue sky laws of the states and other jurisdictions that the Underwriters shall designate, (D) the fees and expenses of any transfer agent or registrar, (E) the reasonable filing fees and reasonable fees and disbursements of Underwriters' counsel incident to any required review and approval by FINRA of the terms of the sale of the Securities, (F) listing fees, if any, and (G) all other costs and expenses incident to the performance by the Company of its obligations hereunder that are not otherwise specifically provided for herein. The Company will reimburse the Representative for its reasonable out-of-pocket expenses, including its legal fees and disbursements, in connection with the purchase and sale of the Securities contemplated hereby up to an aggregate of $60,000 (including amounts payable pursuant to clauses (C) and (E) above). If this Agreement is terminated by the Representative in accordance with the provisions of Section 6, Section 9 or Section 10, the Company will reimburse the Representative for all out-of-pocket fees and disbursements (including, but not limited to, reasonable fees and disbursements of counsel, travel expenses, postage, facsimile and telephone charges), fees and disbursements incurred by the Representative in connection with the Underwriters' investigation, preparing to market and marketing the Securities or in contemplation of performing their obligations hereunder, in an amount not to exceed $60,000 in the aggregate (including amounts payable pursuant to clauses (C) and (E) above).

(ix) The Company intends to apply the net proceeds from the sale of the Securities to be sold by it hereunder for the purposes set forth in the Time of Sale Disclosure Package and in the Final Prospectus.

(x) The Company has not taken and will not take, directly or indirectly, during the Prospectus Delivery Period, any action designed to or which might reasonably be expected to cause or result in, or that has constituted, the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Securities.

(xi) The Company represents and agrees that, unless it obtains the prior written consent of the Representative, and each Underwriter, severally and not jointly, represents and agrees that, unless it obtains the prior written consent of the Company, it has not made and will not make any offer relating to the Securities that would constitute an Issuer Free Writing Prospectus; provided that the prior written consent of the parties hereto shall be deemed to have

been given in respect of the free writing prospectuses included in **Schedule IV**. Any such free writing prospectus consented to by the Company and the Representative is hereinafter referred to as a "Permitted Free Writing Prospectus." The Company represents that it has treated or agrees that it will treat each Permitted Free Writing Prospectus as an "issuer free writing prospectus," as defined in Rule 433, and has complied or will comply with the requirements of Rule 433 applicable to any Permitted Free Writing Prospectus, including timely Commission filing where required, legending and record-keeping.

(xii) The Company hereby agrees that, without the prior written consent of the Representative, it will not, during the period ending 90 days after the date hereof ("Lock-Up Period"), (i) offer, pledge, issue, sell, contract to sell, purchase, contract to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock; or (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of the Common Stock, whether any such transaction described in clause (i) or (ii) above is to be settled by delivery of Common Stock or such other securities, in cash or otherwise; or (iii) file any registration statement with the Commission relating to the offering of any shares of Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock (other than a registration statement on Form S-4 and Form S-8). The restrictions contained in the preceding sentence shall not apply to (1) the Securities to be sold hereunder, (2) the issuance of Common Stock upon the exercise of options, warrants or other exchange rights as disclosed as outstanding in the Registration Statement (excluding exhibits thereto), the Time of Sale Disclosure Package and the Prospectus, or (3) the issuance of employee stock options not exercisable during the Lock-Up Period and the grant of restricted stock awards or restricted stock units pursuant to equity incentive plans described in the Registration Statement (excluding exhibits thereto), the Time of Sale Disclosure Package and the Prospectus.

(xiii) To engage and maintain, at its expense, a registrar and transfer agent for the Common Stock.

(xiv) To use its best efforts to list the Shares and the Warrant Shares on the NASDAQ Capital Market.

(xv) To not take, directly or indirectly, any action designed to cause or result in, or that has constituted or might reasonably be expected to constitute, under the Exchange Act or otherwise, the stabilization or manipulation of the price of any securities of the Company to facilitate the sale or resale of the Securities.

6. ***Conditions of the Underwriters' Obligations.*** The respective obligations of the several Underwriters hereunder to purchase the Securities are subject to the accuracy, as of the date hereof, and at the Closing Date (as if made on the Closing Date), of and compliance in all material respects with all representations, warranties and agreements of the Company contained herein, the performance by the Company of its obligations hereunder and the following additional conditions:

(a) If filing of the Prospectus, or any amendment or supplement thereto, or any Issuer Free Writing Prospectus, is required under the Securities Act or the Rules and Regulations, the Company shall have filed the Prospectus (or such amendment or supplement) or such Issuer Free Writing Prospectus with the Commission in the manner and within the time period so required (without reliance on Rule 424(b)(8) or 164(b) under the Securities Act); the Registration Statement shall remain effective; no stop order suspending the effectiveness of the Registration Statement or any part thereof, any Rule 462 Registration Statement, or any amendment thereof, nor suspending or preventing the use of the Time of Sale Disclosure Package, the Prospectus or any Issuer Free Writing Prospectus shall have been issued; no proceedings for the issuance of such an order shall have been initiated or threatened; any request of the Commission or an Underwriter for additional information (to be included in the Registration Statement, the Time of Sale Disclosure Package, the Prospectus, any Issuer Free Writing Prospectus or otherwise) shall have been complied with to the Underwriters' satisfaction.

(b) On or before the Closing Date, the Company shall have timely submitted to NASDAQ a Listing of Additional Shares Notification Form relating to the Securities and NASDAQ shall have advised the Company that it has no objection to the proposed sale of the Securities as contemplated hereby.

(c) FINRA shall have raised no objection to the fairness and reasonableness of the underwriting terms and arrangements.

(d) None of the Underwriters shall have reasonably determined, and advised the Company , that the Registration Statement, the Time of Sale Disclosure Package or the Prospectus, or any amendment thereof or supplement thereto, or any Issuer Free Writing Prospectus, contains an untrue statement of fact which , in such Underwriter's reasonable opinion, is material, or omits to state a fact which , in such Underwriter's reasonable opinion, is material and is required to be stated therein or necessary to make the statements therein not misleading.

(e) On the Closing Date, there shall have been furnished to the Underwriters the opinion and negative assurance letter of Gracin & Marlow, LLP, as corporate counsel for the Company, dated the Closing Date, and addressed to the Representative, as representative of the Underwriters, in form and substance reasonably satisfactory to the Representative.

(f) On the Closing Date, there shall have been furnished to the Underwriters the opinion and negative assurance letters of (i) Morgan, Lewis & Bockius LLP, as intellectual property counsel for the Company, and (ii) Cuenot, Forsythe & Kim, LLC, as intellectual property counsel for the Company, each dated the Closing Date, and addressed to the Representative, as representative of the Underwriters, in form and substance reasonably satisfactory to the Representative.

(g) On the Closing Date, there shall have been furnished to the Underwriters the opinion and negative assurance letter of Keller and Heckman, LLP, as regulatory counsel for the Company, dated the Closing Date, and addressed to the Representative, as representative of the Underwriters, in form and substance reasonably satisfactory to the Representative.

(h) On the Closing Date, there shall have been furnished to the Underwriters the negative assurance letter of Lowenstein Sandler LLP, counsel to the Underwriters, dated the Closing Date, and addressed to the Representative, as representative of the Underwriters, in form and substance reasonably satisfactory to the Representative.

(i) The Underwriters shall have received a letter of BDO USA LLP on the date hereof and on the Closing Date, addressed to the Representative, as representative of the Underwriters, confirming that they are independent public accountants within the meaning of the Securities Act and are in compliance with the applicable requirements relating to the qualifications of accountants under Rule 2-01 of Regulation S-X of the Commission, and confirming, as of the date of each such letter (or, with respect to matters involving changes or developments since the respective dates as of which specified financial information is given in the Time of Sale Disclosure Package, as of a date not prior to the date hereof or more than five days prior to the date of such letter), the conclusions and findings of said firm with respect to the financial information and other matters required by the Underwriters.

(j) On the Closing Date, there shall have been furnished to the Underwriters a certificate, dated the Closing Date, and addressed to the Representative, as representative of the Underwriters, signed by the chief executive officer and the chief financial officer of the Company, in their capacity as officers of the Company, to the effect that:

(i) The representations and warranties of the Company in this Agreement that are qualified by materiality or by reference to any Material Adverse Effect are true and correct in all respects, and all other representations and warranties of the Company in this Agreement are true and correct, in all material respects, as if made at and as of the Closing Date, and the Company has complied with all the agreements and satisfied all the conditions on its part to be performed or satisfied at or prior to the Closing Date;

(ii) No stop order or other order (A) suspending the effectiveness of the Registration Statement or any part thereof or any amendment thereof, (B) suspending the qualification of the Securities for offering or sale, or (C) suspending or preventing the use of the Time of Sale Disclosure Package, the Prospectus or any Issuer Free Writing Prospectus, has been issued, and no proceeding for that purpose has been instituted or, to their knowledge, is contemplated by the Commission or any state or regulatory body ; and

(iii) There has been no occurrence of any event resulting or reasonably likely to result in a Material Adverse Effect during the period from and after the date of this Agreement and prior to the Closing Date.

(k) On or before the date hereof, the Underwriters shall have received duly executed “lock-up” agreements, in the form set forth on **Schedule V**, by and between the Representative and each of the parties specified in **Schedule VI**.

(m) The Company shall have furnished to the Underwriters and their counsel such additional documents, certificates and evidence as the Underwriters or their counsel may have reasonably requested.

If any condition specified in this Section 6 shall not have been fulfilled when and as required to be fulfilled, this Agreement may be terminated by any Underwriter by notice to the Company at any time at or prior to the Closing Date, and such termination shall be without liability of any party to any other party, except that Section 5(a)(viii), Section 7 and Section 8 shall survive any such termination and remain in full force and effect.

7. Indemnification and Contribution.

(a) The Company agrees to indemnify, defend and hold harmless each Underwriter, its affiliates, directors and officers and employees, and each person, if any, who controls any Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, from and against any losses, claims, damages or liabilities to which such Underwriter or such person may become subject, under the Securities Act or otherwise (including in settlement of any litigation if such settlement is effected with the written consent of the Company), insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon (i) an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, including the information deemed to be a part of the Registration Statement at the time of effectiveness and at any subsequent time pursuant to Rules 430A and 430B of the Rules and Regulations, or arise out of or are based upon the omission from the Registration Statement, or alleged omission to state therein, a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) an untrue statement or alleged untrue statement of a material fact contained in the Time of Sale Disclosure Package, the Prospectus, or any amendment or supplement thereto (including any documents filed under the Exchange Act and deemed to be incorporated by reference into the Registration Statement or the Prospectus), any Issuer Free Writing Prospectus, the Marketing Materials or in any other materials used in connection with the offering of the Securities, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading, (iii) in whole or in part, any inaccuracy in the representations and warranties of the Company contained herein, or (v) in whole or in part, any failure of the Company to perform its obligations hereunder or under law, and will reimburse each Underwriter for any legal or other expenses reasonably incurred by it in connection with evaluating, investigating or defending against such loss, claim, damage, liability or action; *provided, however*, that the Company shall not be liable in any such case to the extent that any such loss, claim, damage, liability or action arises out of or is based upon an untrue statement or alleged untrue statement or omission or alleged omission made in the Registration Statement, the Time of Sale Disclosure Package, the Prospectus, or any amendment or supplement thereto or any Issuer Free Writing Prospectus, in reliance upon and in conformity with written information furnished to the Company by such Underwriter specifically for use in the preparation thereof, which written information is described in Section 7(f).

(b) Each Underwriter, severally and not jointly, will indemnify, defend and hold harmless the Company, its affiliates, directors, officers and employees, and each person, if

any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, from and against any losses, claims, damages or liabilities to which the Company may become subject, under the Securities Act or otherwise (including in settlement of any litigation, if such settlement is effected with the written consent of such Underwriter), insofar as such losses, claims, damages or liabilities (or actions in respect thereof) arise out of or are based upon an untrue statement or alleged untrue statement of a material fact contained in the Registration Statement, the Time of Sale Disclosure Package, the Prospectus, or any amendment or supplement thereto or any Issuer Free Writing Prospectus, or arise out of or are based upon the omission or alleged omission to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, in each case to the extent, but only to the extent, that such untrue statement or alleged untrue statement or omission or alleged omission was made in the Registration Statement, the Time of Sale Disclosure Package, the Prospectus, or any amendment or supplement thereto or any Issuer Free Writing Prospectus in reliance upon and in conformity with written information furnished to the Company by such Underwriter specifically for use in the preparation thereof, which written information is described in Section 7(f), and will reimburse the Company for any legal or other expenses reasonably incurred by the Company in connection with defending against any such loss, claim, damage, liability or action.

(c) Promptly after receipt by an indemnified party under subsection (a) or (b) above of notice of the commencement of any action, such indemnified party shall, if a claim in respect thereof is to be made against the indemnifying party under such subsection, notify the indemnifying party in writing of the commencement thereof; but the failure to notify the indemnifying party shall not relieve the indemnifying party from any liability that it may have to any indemnified party except to the extent such indemnifying party has been materially prejudiced by such failure. In case any such action shall be brought against any indemnified party, and it shall notify the indemnifying party of the commencement thereof, the indemnifying party shall be entitled to participate in, and, to the extent that it shall wish, jointly with any other indemnifying party similarly notified, to assume the defense thereof, with counsel satisfactory to such indemnified party, and after notice from the indemnifying party to such indemnified party of the indemnifying party's election so to assume the defense thereof, the indemnifying party shall not be liable to such indemnified party under such subsection for any legal or other expenses subsequently incurred by such indemnified party in connection with the defense thereof; *provided*, *however*, that if (i) the indemnified party has reasonably concluded (based on advice of counsel) that there may be legal defenses available to it or other indemnified parties that are different from or in addition to those available to the indemnifying party, (ii) a conflict or potential conflict exists (based on advice of counsel to the indemnified party) between the indemnified party and the indemnifying party (in which case the indemnifying party will not have the right to direct the defense of such action on behalf of the indemnified party), or (iii) the indemnifying party has not in fact employed counsel reasonably satisfactory to the indemnified party to assume the defense of such action within a reasonable time after receiving notice of the commencement of the action, the indemnified party shall have the right to employ a single counsel to represent it in any claim in respect of which indemnity may be sought under subsection (a) or (b) of this Section 7, in which event the reasonable fees and expenses of such separate counsel shall be borne by the indemnifying party or parties and reimbursed to the indemnified party as incurred.

The indemnifying party under this Section 7 shall not be liable for any settlement of any proceeding effected without its written consent, but if settled with such consent or if there be a final judgment for the plaintiff, the indemnifying party agrees to indemnify the indemnified party against any loss, claim, damage, liability or expense by reason of such settlement or judgment. No indemnifying party shall, without the prior written consent of the indemnified party, effect any settlement, compromise or consent to the entry of judgment in any pending or threatened action, suit or proceeding in respect of which any indemnified party is a party or could be named and indemnity was or would be sought hereunder by such indemnified party, unless such settlement, compromise or consent (a) includes an unconditional release of such indemnified party from all liability for claims that are the subject matter of such action, suit or proceeding and (b) does not include a statement as to or an admission of fault, culpability or a failure to act by or on behalf of any indemnified party.

(d) If the indemnification provided for in this Section 7 is unavailable or insufficient to hold harmless an indemnified party under subsection (a) or (b) above, then each indemnifying party shall contribute to the amount paid or payable by such indemnified party as a result of the losses, claims, damages or liabilities referred to in subsection (a) or (b) above, (i) in such proportion as is appropriate to reflect the relative benefits received by the Company on the one hand and the Underwriters on the other from the offering and sale of the Securities or (ii) if the allocation provided by clause (i) above is not permitted by applicable law, in such proportion as is appropriate to reflect not only the relative benefits referred to in clause (i) above but also the relative fault of the Company on the one hand and the Underwriters on the other in connection with the statements or omissions that resulted in such losses, claims, damages or liabilities, as well as any other relevant equitable considerations. The relative benefits received by the Company on the one hand and the Underwriters on the other shall be deemed to be in the same proportion as the total net proceeds from the offering (before deducting expenses) received by the Company bear to the total underwriting discounts and commissions received by the Underwriters, in each case as set forth in the table on the cover page of the Final Prospectus. The relative fault shall be determined by reference to, among other things, whether the untrue or alleged untrue statement of a material fact or the omission or alleged omission to state a material fact relates to information supplied by the Company or the Underwriters and the parties' relevant intent, knowledge, access to information and opportunity to correct or prevent such untrue statement or omission. The Company and each Underwriter agree that it would not be just and equitable if contributions pursuant to this subsection (d) were to be determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in the first sentence of this subsection (d). The amount paid by an indemnified party as a result of the losses, claims, damages or liabilities referred to in the first sentence of this subsection (d) shall be deemed to include any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending against any action or claim that is the subject of this subsection (d). Notwithstanding the provisions of this subsection (d), no Underwriter shall be required to contribute any amount in excess of such Underwriter's portion of the underwriting discount set forth in the table on the cover page of the Final Prospectus actually received by such Underwriter pursuant to this Agreement. No person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any person who was not guilty of such fraudulent misrepresentation. The Underwriters' obligations to contribute as provided in this Section 7 are several in proportion to their respective underwriting obligations and not joint.

(e) The obligations of the Company under this Section 7 shall be in addition to any liability that the Company may otherwise have and the benefits of such obligations shall extend, upon the same terms and conditions, to each person, if any, who controls any Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act; and the several obligations of each Underwriter under this Section 7 shall be in addition to any liability that such Underwriter may otherwise have and the benefits of such obligations shall extend, upon the same terms and conditions, to the Company, and its officers, directors and each person who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act.

(f) For purposes of this Agreement, each Underwriter severally confirms, and the Company acknowledges, that there is no information concerning such Underwriter furnished in writing to the Company by such Underwriter specifically for preparation of or inclusion in the Registration Statement, the Time of Sale Disclosure Package, the Prospectus or any Issuer Free Writing Prospectus, other than the statement set forth in the last paragraph on the cover page of the Prospectus and the statements set forth in the "Underwriting" section of the Prospectus and Time of Sale Disclosure Package, only insofar as such statements relate to the amount of selling concession and re-allowance and the lack of stabilization activities to be undertaken by such Underwriter.

8. ***Representations and Agreements to Survive Delivery***. All representations, warranties, and agreements of the Company contained herein or in certificates delivered pursuant hereto, including, but not limited to, the agreements of the several Underwriters and the Company contained in Section 5(a)(viii) and Section 7 hereof, shall remain operative and in full force and effect regardless of any investigation made by or on behalf of the several Underwriters or any controlling person thereof, or the Company or any of its officers, directors, or controlling persons, and shall survive delivery of, and payment for, the Securities to and by the Underwriters hereunder.

9. ***Termination of this Agreement***.

(a) The Representative shall have the right to terminate this Agreement by giving notice to the Company as hereinafter specified at any time at or prior to the Closing Date, if in the discretion of the Representative, (i) there has occurred any material adverse change in the securities markets or any event, act or occurrence that has materially disrupted, or in the opinion of the Representative, will in the future materially disrupt, the securities markets or there shall be such a material adverse change in general financial, political or economic conditions or the effect of international conditions on the financial markets in the United States is such as to make it, in the judgment of the Representative, inadvisable or impracticable to market the Securities or enforce contracts for the sale of the Securities, (ii) trading in the Company's Common Stock shall have been suspended by the Commission, the NASDAQ Capital Market or trading in securities generally on any NASDAQ Stock Market, the New York Stock Exchange or the NYSE MKT shall have been suspended, (iii) minimum or maximum prices for trading shall have been fixed, or maximum ranges for prices for securities shall have been required, on any NASDAQ Capital Market, the New York Stock Exchange, or the NYSE MKT, by such exchange or by order of the Commission or any other governmental authority having jurisdiction, (iv) a banking moratorium shall have been declared by federal or New York or

California state authorities, (v) there shall have occurred any attack on, outbreak or escalation of hostilities or act of terrorism involving the United States, any declaration by the United States of a national emergency or war, any substantial change or development involving a prospective substantial change in United States or international political, financial or economic conditions or any other calamity or crisis, (vi) the Company suffers any loss by strike, fire, flood, earthquake, accident or other calamity, whether or not covered by insurance, or (vii) in the judgment of the Representative, there has been, since the time of execution of this Agreement or since the respective dates as of which information is given in the Prospectus, any material adverse change in the assets, properties, condition, financial or otherwise, or in the results of operations, business affairs or business prospects of the Company and its subsidiaries considered as a whole, whether or not arising in the ordinary course of business. Any such termination shall be without liability of any party to any other party except that the provisions of Section 5(a)(viii) and Section 7 hereof shall at all times be effective and shall survive such termination.

(b) If the Representative elects to terminate this Agreement as provided in this Section, the Company and the other Underwriters shall be notified promptly by the Representative by telephone, confirmed by letter.

10. ***Substitution of Underwriters***. If any Underwriter or Underwriters shall default in its or their obligations to purchase Securities hereunder on the Closing Date and the aggregate number of Shares and Warrants which such defaulting Underwriter or Underwriters agreed but failed to purchase does not exceed ten percent (10%) of the total number of Shares and Warrants to be purchased by all Underwriters on such Closing Date, the other Underwriters shall be obligated severally, in proportion to their respective commitments hereunder, to purchase the Shares and Warrants which such defaulting Underwriter or Underwriters agreed but failed to purchase on such Closing Date. If any Underwriter or Underwriters shall so default and the aggregate number of Shares and Warrants with respect to which such default or defaults occur is more than ten percent (10%) of the total number of Shares and Warrants to be purchased by all Underwriters on such Closing Date and arrangements satisfactory to the remaining Underwriters and the Company for the purchase of such Shares and Warrants by other persons are not made within forty-eight (48) hours after such default, this Agreement shall terminate.

If the remaining Underwriters or substituted Underwriters are required hereby or agree to take up all or part of the Shares and Warrants of a defaulting Underwriter or Underwriters on such Closing Date as provided in this Section 10, (i) the Company shall have the right to postpone such Closing Date for a period of not more than five (5) full business days in order to permit the Company to effect whatever changes in the Registration Statement, the Prospectus, or in any other documents or arrangements, which may thereby be made necessary, and the Company agrees to promptly file any amendments to the Registration Statement or the Prospectus which may thereby be made necessary, and (ii) the respective numbers of Shares and Warrants to be purchased by the remaining Underwriters or substituted Underwriters shall be taken as the basis of their underwriting obligation for all purposes of this Agreement. Nothing herein contained shall relieve any defaulting Underwriter of its liability to the Company or any other Underwriter for damages occasioned by its default hereunder. Any termination of this Agreement pursuant to this Section 10 shall be without liability on the part of any non-defaulting Underwriters or the Company, except that the representations, warranties, covenants, indemnities, agreements and other statements set forth in Section 2 and 3, the obligations with

respect to expenses to be paid or reimbursed pursuant to Section 5 and the provisions of Section 7 and Sections 11 through 18, inclusive, shall not terminate and shall remain in full force and effect.

11. ***Notices***. Except as otherwise provided herein, all communications hereunder shall be in writing and, (i) if to the Underwriters, shall be mailed, delivered or telecopied to Roth Capital Partners, LLC, 888 San Clemente Drive, Newport Beach, CA 92660, telecopy number: (949) 720-7227, Attention: Managing Director, and (ii) if to the Company, shall be mailed, delivered or telecopied to it at Heat Biologics, Inc., 801 Capitola Drive, Durham, NC 27713, telecopy number: (919) 240-7133, Attention: Chief Executive Officer; or in each case to such other address as the person to be notified may have requested in writing. Any party to this Agreement may change such address for notices by sending to the parties to this Agreement written notice of a new address for such purpose.

12.

Persons Entitled to Benefit of Agreement. This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns and the controlling persons, officers and directors referred to in Section 7. Nothing in this Agreement is intended or shall be construed to give to any other person, firm or corporation any legal or equitable remedy or claim under or in respect of this Agreement or any provision herein contained. The term "successors and assigns" as herein used shall not include any purchaser, as such purchaser, of any of the Securities from any Underwriter.

13.

Absence of Fiduciary Relationship. The Company acknowledges and agrees that: (a) each Underwriter has been retained solely to act as underwriter in connection with the sale of the Securities and that no fiduciary, advisory or agency relationship between the Company and any Underwriter has been created in respect of any of the transactions contemplated by this Agreement, irrespective of whether any Underwriter has advised or is advising the Company on other matters; (b) the price and other terms of the Securities set forth in this Agreement were established by the Company following discussions and arms-length negotiations with the Underwriters and the Company is capable of evaluating and understanding and understands and accepts the terms, risks and conditions of the transactions contemplated by this Agreement; (c) it has been advised that each Underwriter and its affiliates are engaged in a broad range of transactions that may involve interests that differ from those of the Company and that no Underwriter has any obligation to disclose such interest and transactions to the Company by virtue of any fiduciary, advisory or agency relationship; (d) it has been advised that each Underwriter is acting, in respect of the transactions contemplated by this Agreement, solely for the benefit of such Underwriter, and not on behalf of the Company.

14.

Amendments and Waivers. No supplement, modification or waiver of this Agreement shall be binding unless executed in writing by the party to be bound thereby. The failure of a party to exercise any right or remedy shall not be deemed or constitute a waiver of such right or remedy in the future. No waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provision hereof (regardless of whether similar), nor shall any such waiver be deemed or constitute a continuing waiver unless otherwise expressly provided.

15. ***Partial Unenforceability***. The invalidity or unenforceability of any section, paragraph, clause or provision of this Agreement shall not affect the validity or enforceability of any other section, paragraph, clause or provision.

16. ***Governing Law***. This Agreement shall be governed by and construed in accordance with the laws of the State of New York.

17. ***Submission to Jurisdiction***. The Company irrevocably (a) submits to the jurisdiction of any court of the State of New York for the purpose of any suit, action, or other proceeding arising out of this Agreement, or any of the agreements or transactions contemplated by this Agreement, the Registration Statement, the Time of Sale Disclosure Package and the Prospectus (each a "Proceeding"), (b) agrees that all claims in respect of any Proceeding may be heard and determined in any such court, (c) waives, to the fullest extent permitted by law, any immunity from jurisdiction of any such court or from any legal process therein, (d) agrees not to commence any Proceeding other than in such courts, and (e) waives, to the fullest extent permitted by law, any claim that such Proceeding is brought in an inconvenient forum. THE COMPANY (ON BEHALF OF ITSELF AND, TO THE FULLEST EXTENT PERMITTED BY LAW, ON BEHALF OF ITS RESPECTIVE EQUITY HOLDERS AND CREDITORS) HEREBY WAIVES ANY RIGHT IT MAY HAVE TO A TRIAL BY JURY IN RESPECT OF ANY CLAIM BASED UPON, ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT AND THE TRANSACTIONS CONTEMPLATED BY THIS AGREEMENT, THE REGISTRATION STATEMENT, THE TIME OF SALE DISCLOSURE PACKAGE AND THE PROSPECTUS.

18.

Counterparts. This Agreement may be executed in one or more counterparts and, if executed in more than one counterpart, the executed counterparts shall each be deemed to be an original and all such counterparts shall together constitute one and the same instrument.

[Signature Page Follows]

Please sign and return to the Company the enclosed duplicates of this letter whereupon this letter will become a binding agreement between the Company and the several Underwriters in accordance with its terms.

Very truly yours,

HEAT BIOLOGICS, INC.

By: _____
Name: Jeffrey Wolf
Title: Chief Executive Officer and Chairman of the Board of Directors

Confirmed as of the date first above- mentioned
by the Representative of the several Underwriters.

ROTH CAPITAL PARTNERS, LLC

By: _____
Name: Aaron M. Gurewitz
Title: Head of Equity Capital Markets

SCHEDULE I

Name	Number of Shares to be Purchased	Number of Warrants to be Purchased
Roth Capital Partners, LLC	[●]	[●]
Aegis Capital Corporation	[●]	[●]
[●]	[●]	[●]
Total	[●]	[●]

SCHEDULE II

Final Term Sheet

Issuer:	Heat Biologics, Inc. (the "Company")
Symbol:	HTBX
Securities:	[●] shares of common stock, par value $0.0002 per share (the "Common Stock"), of the Company and warrants (the "Warrants") to purchase up to [●]shares of Common Stock at an exercise price of $[●] per share (subject to adjustment). Each share of Common Stock is being sold together with [●] of a Warrant to purchase one share of Common Stock.
Exercisability of Warrants:	The Warrants will be immediately exercisable and will expire five years from the original issuance date
Public offering price:	$[●] per share of Common Stock and related Warrant
Underwriting discount:	$[●] per share of Common Stock and related Warrant
Expected net proceeds:	Approximately $[●] million (after deducting the underwriting discount and estimated offering expenses payable by the Company)
Trade date:	March [●], 2016
Settlement date:	March [●], 2016
Underwriters:	Roth Capital Partners, LLC, Aegis Capital Corporation, [●]

SCHEDULE III

Subsidiaries

Name of Subsidiary	Jurisdiction
Heat Biologics I, Inc.	Delaware
Heat Biologics III, Inc.	Delaware
Heat Biologics IV, Inc.	Delaware
Heat Biologics GmbH	Germany
Heat Biologics Australia Pty LTD	Australia

SCHEDULE IV

Free Writing Prospectus

SCHEDULE V

Form of Lock-Up Agreement

March __, 2016

Roth Capital Partners, LLC
888 San Clemente Drive
Newport Beach, CA 92660

As the Representative of the Several Underwriters

Ladies and Gentlemen:

This Lock-Up Agreement is being delivered to you in connection with the proposed Underwriting Agreement (the " Underwriting Agreement") to be entered into by and between Heat Biologics, Inc., a Delaware corporation (the "Company"), and Roth Capital Partners, LLC, as the representative (the "Representative") of the several underwriters named in **Schedule I** to the Underwriting Agreement (the " Underwriters," or each, an "Underwriter"), with respect to the proposed public offering of securities of the Company (the "Offering") including shares of common stock, par value $0.0002 per share, of the Company (the "Common Stock") and warrants to purchase Common Stock (the " Warrants"). Capitalized terms used and not otherwise defined herein shall have the meanings given them in the Underwriting Agreement.

In order to induce you to enter into the Underwriting Agreement, the undersigned agrees that, for a period (the " Lock-Up Period") beginning on the date hereof and ending on, and including, the date that is 90 days after the date of the final prospectus relating to the Offering, the undersigned will not, without the prior written consent of the Representative, (i) sell, offer to sell, contract or agree to sell, hypothecate, pledge, grant any option to purchase or otherwise dispose of or agree to dispose of, directly or indirectly, or file (or participate in the filing of) a registration statement with the Securities and Exchange Commission (the "Commission") in respect of, or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Securities Exchange Act of 1934, as amended, and the rules and regulations of the Commission promulgated thereunder (the "Exchange Act") with respect to, any Common Stock or any other securities of the Company that are substantially similar to Common Stock, or any securities convertible into or exchangeable or exercisable for, or any warrants or other rights to purchase, the foregoing, (ii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of Common Stock or any other securities of the Company that are substantially similar to Common Stock, or any securities convertible into or exchangeable or exercisable for, or any warrants or other rights to purchase, the foregoing, whether any such transaction is to be settled by delivery of Common Stock or such other securities, in cash or otherwise or (iii) publicly announce an intention to effect any transaction specified in clause (i) or (ii).

The foregoing paragraph shall not apply to (a) the registration of the offer and sale of Common Stock and Warrants as contemplated by the Underwriting Agreement and the sale of the Common Stock and the Warrants to the several Underwriters in the Offering, (b) bona fide gifts, provided the recipient thereof agrees in writing with the Representative to be bound by the terms of this Lock-Up Agreement, (c) dispositions to any trust for the direct or indirect benefit of the undersigned and/or the immediate family of the undersigned, provided that such trust agrees in writing with the Representative to be bound by the terms of this Lock-Up Agreement, (d) transfers of Common Stock or securities convertible into

Common Stock on death by will or intestacy, (e) sales or transfers of Common Stock solely in connection with the "cashless" exercise of Company stock options outstanding on the date hereof for the purpose of exercising such stock options (provided that any remaining Common Stock received upon such exercise will be subject to the restrictions provided for in this Lock-Up Agreement) or (f) sales or transfers of Common Stock or securities convertible into Common Stock pursuant to a sales plan entered into prior to the date hereof pursuant to Rule 10b5-1 under the Exchange Act, a copy of which has been provided to the Representative. In addition, the restrictions sets forth herein shall not prevent the undersigned from entering into a sales plan pursuant to Rule 10b5-1 under the Exchange Act after the date hereof, provided that (i) a copy of such plan is provided to the Representative promptly upon entering into the same and (ii) no sales or transfers may be made under such plan until the Lock-Up Period ends or this Lock-Up Agreement is terminated in accordance with its terms. For purposes of this paragraph, "immediate family" shall mean the undersigned and the spouse, any lineal descendent, father, mother, brother or sister of the undersigned.

In addition, the undersigned hereby waives any rights the undersigned may have to require registration of Common Stock in connection with the filing of a registration statement relating to the Offering. The undersigned further agrees that, for the Lock-Up Period, the undersigned will not, without the prior written consent of the Representative, make any demand for, or exercise any right with respect to, the registration of Common Stock or any securities convertible into or exercisable or exchangeable for Common Stock, or warrants or other rights to purchase Common Stock or any such securities.

The undersigned hereby confirms that the undersigned has not, directly or indirectly, taken, and hereby covenants that the undersigned will not, directly or indirectly, take, any action designed, or which has constituted or will constitute or might reasonably be expected to cause or result in the stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of shares of Common Stock.

If (i) the Company notifies you in writing that it does not intend to proceed with the Offering, (ii) the registration statement filed with the Commission with respect to the Offering is withdrawn, (iii) if the closing of the Offering does not occur prior to ninety (90) days from the date of this Lock-Up Agreement or (iv) for any reason the Underwriting Agreement shall be terminated prior to the effective time of the Registration Statement (as defined in the Underwriting Agreement), this Lock-Up Agreement shall be terminated and the undersigned shall be released from its obligations hereunder.

[signature page follows]

Very truly yours,

_____

(Name - Please Print)

_____

(Signature)

_____

(Name of Signatory, in the case of entities - Please Print)

_____

(Title of Signatory, in the case of entities - Please Print)

Address: _____

_____

_____

SCHEDULE VI

List of officers, directors and stockholders executing lock-up agreements

Jeffrey Wolf
Timothy Creech
Anil K. Goyal Ph.D.
Melissa Price Ph.D.
Taylor Schreiber
John Monahan, Ph.D.
Paul Belsky, MD
Michael Kharitonov, Ph.D.
Edward B. Smith
Louis C. Bock
Seed-One Holdings VI, LLC
Orion Holdings V, LLC
Anstar Capital Management, LLC

EXHIBIT 4.15

FORM OF WARRANT

THE NUMBER OF SHARES OF COMMON STOCK ISSUABLE UPON EXERCISE OF THIS WARRANT MAY BE LESS THAN THE AMOUNTS SET FORTH ON THE FACE HEREOF PURSUANT TO SECTION 1(a) OF THIS WARRANT.

HEAT BIOLOGICS, INC.

SERIES [●] WARRANT TO PURCHASE COMMON STOCK

Warrant No.:

Date of Issuance: March [●], 2016 ("**Issuance Date**")

HEAT BIOLOGICS, INC., a Delaware corporation (the "**Company**"), hereby certifies that, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, [BUYER], the registered holder hereof or its permitted assigns (the "**Holder**"), is entitled, subject to the terms set forth below, to purchase from the Company, at the Exercise Price (as defined below) then in effect, upon exercise of this Warrant to Purchase Common Stock (including any Warrants to Purchase Common Stock issued in exchange, transfer or replacement hereof, the "**Warrant**"), at any time or times on or after the Issuance Date (the "**Initial Exercise Date**"), but not after 11:59 p.m., New York time, on the Expiration Date (as defined below), _____ (subject to adjustment as provided herein) fully paid and non-assessable shares of Common Stock (as defined below) (the "**Warrant Shares**"). Except as otherwise defined herein, capitalized terms in this Warrant shall have the meanings set forth in Section 17. This Warrant is one of the Warrants to Purchase Common Stock (the "**Registered Warrants**") issued pursuant to (i) that certain Underwriting Agreement, dated as of March [●], 2016 (the "**Subscription Date**"), by and among the Company and the underwriter(s) referred to therein, as amended from time to time (the "**Underwriting Agreement**") and (ii) the Company's Registration Statement on Form S-1 (File number 333-209079) (the "**Registration Statement**").

1. EXERCISE OF WARRANT.

(a) Subject to the terms and conditions hereof (including, without limitation, the limitations set forth in Section 1(f)), this Warrant may be exercised by the Holder on any day on or after the Initial Exercise Date (an "**Exercise Date**"), in whole or in part, by delivery (whether via facsimile or otherwise) of a written notice, in the form attached hereto as **Exhibit A** (the "**Exercise Notice**"), of the Holder's election to exercise this Warrant. Within three (3) Trading Days following an exercise of this Warrant as aforesaid, the Holder shall deliver payment to the Company of an amount equal to the Exercise Price in effect on the date of such exercise multiplied by the number of Warrant Shares as to which this Warrant was so exercised (the "**Aggregate Exercise Price**") in cash or via wire transfer of immediately available funds if the Holder did not notify the Company in such Exercise Notice that such exercise was made pursuant to a Cashless Exercise (as defined in Section 1(d)). The Holder shall not be required to deliver the original of this Warrant in order to effect an exercise hereunder. Execution and delivery of an Exercise Notice with respect to less than all of the Warrant Shares shall have the

same effect as cancellation of the original of this Warrant and issuance of a new Warrant evidencing the right to purchase the remaining number of Warrant Shares. Execution and delivery of an Exercise Notice for all of the then-remaining Warrant Shares shall have the same effect as cancellation of the original of this Warrant after delivery of the Warrant Shares in accordance with the terms hereof. On or before the second (2nd) Trading Day following the date on which the Company has received an Exercise Notice, the Company shall transmit by facsimile or electronic mail an acknowledgment of confirmation of receipt of such Exercise Notice, in the form attached hereto as **Exhibit B**, to the Holder and the Company's transfer agent (the "**Transfer Agent**"), which confirmation shall constitute an instruction to the Transfer Agent to process such Exercise Notice in accordance with the terms herein. On or before the third (3rd) Trading Day following the date on which the Company has received such Exercise Notice, duly completed and executed by Holder, (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade of such Warrant Shares initiated on the applicable Exercise Date), the Company shall (i) provided that the Transfer Agent is participating in The Depository Trust Company ("**DTC**") Fast Automated Securities Transfer Program, upon the request of the Holder, credit such aggregate number of shares of Common Stock to which the Holder is entitled pursuant to such exercise to the Holder's or its designee's balance account with DTC through its Deposit/Withdrawal at Custodian system, or (ii) if the Transfer Agent is not participating in the DTC Fast Automated Securities Transfer Program, upon the request of the Holder, issue and deliver (via reputable overnight courier) to the address as specified in the Exercise Notice, a certificate, registered in the name of the Holder or its designee, for the number of shares of Common Stock to which the Holder shall be entitled pursuant to such exercise. Upon delivery of an Exercise Notice, duly completed and executed by the Holder and in the case of a cash exercise, the Aggregate Exercise Price, the Holder shall be deemed for all corporate purposes to have become the holder of record of the Warrant Shares with respect to which this Warrant has been exercised, irrespective of the date such Warrant Shares are credited to the Holder's DTC account or the date of delivery of the certificates evidencing such Warrant Shares (as the case may be). If this Warrant is submitted in connection with any exercise pursuant to this Section 1(a) and the number of Warrant Shares represented by this Warrant submitted for exercise is greater than the number of Warrant Shares being acquired upon an exercise and upon surrender of this Warrant to the Company by the Holder, then, at the request of the Holder, the Company shall as soon as practicable and in no event later than three (3) Trading Days after any exercise and at its own expense, issue and deliver to the Holder (or its designee) a new Warrant (in accordance with Section 7(d)) representing the right to purchase the number of Warrant Shares purchasable immediately prior to such exercise under this Warrant, less the number of Warrant Shares with respect to which this Warrant is exercised. No fractional shares of Common Stock are to be issued upon the exercise of this Warrant. As to any fraction of a share which the Holder would otherwise be entitled to purchase upon such exercise, the Company shall, at its election, either pay a cash adjustment in respect of such final fraction in an amount equal to such fraction multiplied by the Exercise Price or round up to the next whole share. The Company shall pay any and all transfer, stamp, issuance and similar taxes, costs and expenses (including, without limitation, fees and expenses of the Transfer Agent) that may be payable with respect to the issuance and delivery of Warrant Shares upon exercise of this Warrant; provided that the Company shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than the Holder or its agent on its behalf. Notwithstanding the foregoing, except in the case

where an exercise of this Warrant is validly made pursuant to a Cashless Exercise, the Company's failure to deliver Warrant Shares to the Holder on or prior to the later of (A) three (3) Trading Days after receipt of the applicable Exercise Notice (or such earlier date as required pursuant to the 1934 Act or other applicable law, rule or regulation for the settlement of a trade of such Warrant Shares initiated on the applicable Exercise Date) and (B) one (1) Trading Day after the Company's receipt of the Aggregate Exercise Price (or valid notice of a Cashless Exercise) (such later date, the "**Share Delivery Deadline**") shall not be deemed to be a breach of this Warrant. From the Issuance Date through and including the Expiration Date, the Company shall maintain a transfer agent that participates in the DTC's Fast Automated Securities Transfer Program.

(b) Exercise Price. For purposes of this Warrant, "**Exercise Price**" means $[●], subject to adjustment as provided herein.

(c) Company's Failure to Timely Deliver Securities. If the Company shall fail, for any reason or for no reason, on or prior to the Share Delivery Deadline, either (I) if the Transfer Agent is not participating in the DTC Fast Automated Securities Transfer Program, to issue and deliver to the Holder (or its designee) a certificate for the number of Warrant Shares to which the Holder is entitled and register such Warrant Shares on the Company's share register or, if the Transfer Agent is participating in the DTC Fast Automated Securities Transfer Program, to credit the balance account of the Holder or the Holder's designee with DTC for such number of Warrant Shares to which the Holder is entitled upon the Holder's exercise of this Warrant (as the case may be) or (II) if the Registration Statement (or prospectus contained therein) covering the issuance of the Warrant Shares that are the subject of the Exercise Notice (the "**Unavailable Warrant Shares**") is not available for the issuance of such Unavailable Warrant Shares and the Company fails to promptly (x) so notify the Holder and (y) deliver the Warrant Shares electronically without any restrictive legend by crediting such aggregate number of Warrant Shares to which the Holder is entitled pursuant to such exercise to the Holder's or its designee's balance account with DTC through its Deposit/Withdrawal At Custodian system (the event described in the immediately foregoing clause (II) is hereinafter referred as a "**Notice Failure**" and together with the event described in clause (I) above, a "**Delivery Failure**"), and if on or after such Share Delivery Deadline the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of all or any portion of the number of shares of Common Stock issuable upon such exercise that the Holder anticipated receiving from the Company (a "**Buy-In**"), then, in addition to all other remedies available to the Holder, the Company shall, within three (3) Trading Days after the Holder's request and in the Holder's discretion, either (i) pay cash to the Holder in an amount equal to the Holder's total purchase price (including brokerage commissions and other out-of-pocket expenses, if any) for the shares of Common Stock so purchased (including, without limitation, by any other Person in respect, or on behalf, of the Holder) (the "**Buy-In Price**"), at which point the Company's obligation to so issue and deliver such certificate (and to issue such shares of Common Stock) or credit the balance account of such Holder or such Holder's designee, as applicable, with DTC for the number of Warrant Shares to which the Holder is entitled upon the Holder's exercise hereunder (as the case may be) (and to issue such Warrant Shares) shall terminate, or (ii) promptly honor its obligation to so issue and deliver to the Holder a certificate or certificates representing such Warrant Shares or credit the balance account of such Holder or

such Holder's designee, as applicable, with DTC for the number of Warrant Shares to which the Holder is entitled upon the Holder's exercise hereunder (as the case may be) and pay cash to the Holder in an amount equal to the excess (if any) of the Buy-In Price over the product of (A) such number of Warrant Shares multiplied by (B) the lowest Closing Sale Price of the Common Stock on any Trading Day during the period commencing on the date of the applicable Exercise Notice and ending on the date of such issuance and payment under this clause (ii) (the "**Buy-In Payment Amount**"). Nothing shall limit the Holder's right to pursue any other remedies available to it hereunder, at law or in equity, including, without limitation, a decree of specific performance and/or injunctive relief with respect to the Company's failure to timely deliver certificates representing shares of Common Stock (or to electronically deliver such shares of Common Stock) upon the exercise of this Warrant as required pursuant to the terms hereof.

(d) Cashless Exercise. Notwithstanding anything contained herein to the contrary (other than Section 1(f) below), if at the time of exercise hereof the Registration Statement is not effective (or the prospectus contained therein is not available for use) for the issuance of all of the Warrant Shares, then the Holder may, in its sole discretion, exercise this Warrant in whole or in part and, in lieu of making the cash payment otherwise contemplated to be made to the Company upon such exercise in payment of the Aggregate Exercise Price, elect instead to receive upon such exercise the "Net Number" of Warrant Shares determined according to the following formula (a "**Cashless Exercise**"):

$$\text{Net Number} = \frac{(A \times B) - (A \times C)}{B}$$

For purposes of the foregoing formula:

A= the total number of shares with respect to which this Warrant is then being exercised.

B = the quotient of (x) the sum of the VWAP of the Common Stock of each of the five (5) Trading Days ending at the close of business on the Principal Market immediately prior to the time of exercise as set forth in the applicable Exercise Notice , divided by (y) five (5).

C = the Exercise Price then in effect for the applicable Warrant Shares at the time of such exercise.

If the Warrant Shares are issued in a Cashless Exercise, the parties acknowledge and agree that in accordance with Section 3(a)(9) of the 1933 Act, the Warrant Shares take on the registered characteristics of the Warrants being exercised. For purposes of Rule 144(d) promulgated under the 1933 Act, as in effect on the Subscription Date, it is intended that the Warrant Shares issued in a Cashless Exercise shall be deemed to have been acquired by the Holder, and the holding period for the Warrant Shares shall be deemed to have commenced, on the date this Warrant was originally issued pursuant to the Underwriting Agreement.

(e) Disputes. In the case of a dispute as to the determination of the Exercise Price or the arithmetic calculation of the number of Warrant Shares to be issued pursuant to the terms

hereof, the Company shall promptly issue to the Holder the number of Warrant Shares that are not disputed and resolve such dispute in accordance with Section 13.

(f) Limitations on Exercises. The Company shall not effect the exercise of any portion of this Warrant, and the Holder shall not have the right to exercise any portion of this Warrant, pursuant to the terms and conditions of this Warrant and any such exercise shall be null and void and treated as if never made, to the extent that after giving effect to such exercise, the Holder together with the other Attribution Parties collectively would beneficially own in excess of 4.99% (the "**Maximum Percentage**") of the shares of Common Stock outstanding immediately after giving effect to such exercise. For purposes of the foregoing sentence, the aggregate number of shares of Common Stock beneficially owned by the Holder and the other Attribution Parties shall include the number of shares of Common Stock held by the Holder and all other Attribution Parties plus the number of shares of Common Stock issuable upon exercise of this Warrant with respect to which the determination of such sentence is being made, but shall exclude shares of Common Stock which would be issuable upon (A) exercise of the remaining, unexercised portion of this Warrant beneficially owned by the Holder or any of the other Attribution Parties and (B) exercise or conversion of the unexercised or unconverted portion of any other securities of the Company (including, without limitation, any convertible notes or convertible preferred stock or warrants, including other Registered Warrants) beneficially owned by the Holder or any other Attribution Party subject to a limitation on conversion or exercise analogous to the limitation contained in this Section 1(f)(i). For purposes of this Section 1(f)(i), beneficial ownership shall be calculated in accordance with Section 13(d) of the 1934 Act. For purposes of determining the number of outstanding shares of Common Stock the Holder may acquire upon the exercise of this Warrant without exceeding the Maximum Percentage, the Holder may rely on the number of outstanding shares of Common Stock as reflected in (x) the Company's most recent Annual Report on Form 10-K, Quarterly Report on Form 10-Q, Current Report on Form 8-K or other public filing with the SEC, as the case may be, (y) a more recent public announcement by the Company or (z) any other written notice by the Company or the Transfer Agent, if any, setting forth the number of shares of Common Stock outstanding (the "**Reported Outstanding Share Number**"). If the Company receives an Exercise Notice from the Holder at a time when the actual number of outstanding shares of Common Stock is less than the Reported Outstanding Share Number, the Company shall (i) notify the Holder in writing of the number of shares of Common Stock then outstanding and, to the extent that such Exercise Notice would otherwise cause the Holder's beneficial ownership, as determined pursuant to this Section 1(f)(i), to exceed the Maximum Percentage, the Holder must notify the Company of a reduced number of Warrant Shares to be acquired pursuant to such Exercise Notice (the number of shares by which such purchase is reduced, the "**Reduction Shares**") and (ii) as soon as reasonably practicable, the Company shall return to the Holder any exercise price paid by the Holder for the Reduction Shares. For any reason at any time, upon the written or oral request of the Holder, the Company shall within one (1) Business Day confirm orally and in writing or by electronic mail to the Holder the number of shares of Common Stock then outstanding. In any case, the number of outstanding shares of Common Stock shall be determined after giving effect to the conversion or exercise of securities of the Company, including this Warrant, by the Holder and any other Attribution Party since the date as of which the Reported Outstanding Share Number was reported. In the event that the issuance of shares of Common Stock to the Holder upon exercise of this Warrant results in the Holder and the other Attribution Parties being

deemed to beneficially own, in the aggregate, more than the Maximum Percentage of the number of outstanding shares of Common Stock (as determined under Section 13(d) of the 1934 Act), the number of shares so issued by which the Holder's and the other Attribution Parties' aggregate beneficial ownership exceeds the Maximum Percentage (the "**Excess Shares**") shall be deemed null and void and shall be cancelled ab initio, and the Holder shall not have the power to vote or to transfer the Excess Shares. As soon as reasonably practicable after the issuance of the Excess Shares has been deemed null and void, the Company shall return to the Holder the exercise price paid by the Holder for the Excess Shares. Upon delivery of a written notice to the Company, the Holder may from time to time increase or decrease the Maximum Percentage to any other percentage not in excess of 9.99% as specified in such notice; provided that (i) any such increase in the Maximum Percentage will not be effective until the sixty-first (61^{st}) day after such notice is delivered to the Company and (ii) any such increase or decrease will apply only to the Holder and the other Attribution Parties and not to any other holder of Registered Warrants that is not an Attribution Party of the Holder. For purposes of clarity, the shares of Common Stock issuable pursuant to the terms of this Warrant in excess of the Maximum Percentage shall not be deemed to be beneficially owned by the Holder for any purpose including for purposes of Section 13(d) or Rule 16a-1(a)(1) of the 1934 Act. No prior inability to exercise this Warrant pursuant to this paragraph shall have any effect on the applicability of the provisions of this paragraph with respect to any subsequent determination of exercisability. The provisions of this paragraph shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this Section 1(f)(i) to the extent necessary to correct this paragraph or any portion of this paragraph which may be defective or inconsistent with the intended beneficial ownership limitation contained in this Section 1(f)(i) or to make changes or supplements necessary or desirable to properly give effect to such limitation. The limitation contained in this paragraph may not be waived and shall apply to a successor holder of this Warrant.

(g) Reservation of Shares.

(i) Required Reserve Amount. At all times from and after the Initial Exercise Date, so long as this Warrant remains outstanding, the Company shall at all times keep reserved for issuance under this Warrant a number of shares of Common Stock at least equal to the maximum number of shares of Common Stock as shall be necessary to satisfy the Company's obligation to issue shares of Common Stock under the Registered Warrants then outstanding (without regard to any limitations on exercise) (the "**Required Reserve Amount**"); provided that at no time shall the number of shares of Common Stock reserved pursuant to this Section 1(g)(i) be reduced other than proportionally in connection with any exercise or redemption of Registered Warrants or such other event covered by Section 2 below. The Required Reserve Amount (including, without limitation, each increase in the number of shares so reserved) shall be allocated pro rata among the holders of the Registered Warrants based on number of shares of Common Stock issuable upon exercise of Registered Warrants held by each holder on the initial Issuance Date (without regard to any limitations on exercise) or increase in the number of reserved shares, as the case may be (the "**Authorized Share Allocation**"). In the event that a holder shall sell or otherwise transfer any of such holder's Registered Warrants, each transferee shall be allocated a pro rata portion of such holder's Authorized Share Allocation. Any shares of Common Stock reserved and allocated to any Person which

ceases to hold any Registered Warrants shall be allocated to the remaining holders of Registered Warrants, pro rata based on the number of shares of Common Stock issuable upon exercise of the Registered Warrants then held by such holders (without regard to any limitations on exercise).

(ii) Insufficient Authorized Shares. If, notwithstanding Section 1(g)(i) above, and not in limitation thereof, at any time while any of the Registered Warrants remain outstanding, the Company does not have a sufficient number of authorized and unreserved shares of Common Stock to reserve (or maintain a reserve of, as applicable) the Required Reserve Amount (an "**Authorized Share Failure**"), then the Company shall promptly take all action reasonably necessary to increase the Company's authorized shares of Common Stock to an amount sufficient to allow the Company to reserve the Required Reserve Amount for all the Registered Warrants then outstanding. Without limiting the generality of the foregoing sentence, as soon as practicable after the date of the occurrence of an Authorized Share Failure, but in no event later than ninety (90) days after the occurrence of such Authorized Share Failure, the Company shall hold a meeting of its stockholders for the approval of an increase in the number of authorized shares of Common Stock. In connection with such meeting, the Company shall provide each stockholder with a proxy statement and shall use its reasonable best efforts to solicit its stockholders' approval of such increase in authorized shares of Common Stock and to cause its board of directors to recommend to the stockholders that they approve such proposal. In the event that the Company is prohibited from issuing shares of Common Stock upon an exercise of this Warrant due to the failure by the Company to have sufficient shares of Common Stock available out of the authorized but unissued shares of Common Stock (such unavailable number of shares of Common Stock, the "**Authorization Failure Shares**"), in lieu of delivering such Authorization Failure Shares to the Holder upon exercise of this Warrant, the Company shall pay cash in exchange for the cancellation of such portion of this Warrant exercisable into such Authorization Failure Shares at a price equal to the sum of (i) the product of (x) such number of Authorization Failure Shares and (y) the greatest Closing Sale Price of the Common Stock on any Trading Day during the period commencing on the date the Holder delivers the applicable Exercise Notice with respect to such Authorization Failure Shares to the Company and ending on the date of such issuance and payment under this Section 1(f); and (ii) to the extent the Holder purchases (in an open market transaction or otherwise) shares of Common Stock to deliver in satisfaction of a sale by the Holder of Authorization Failure Shares, any Buy-In Payment Amount, brokerage commissions and other out-of-pocket expenses, if any, of the Holder incurred in connection therewith .

2. ADJUSTMENT OF EXERCISE PRICE AND NUMBER OF WARRANT SHARES. The Exercise Price and number of Warrant Shares issuable upon exercise of this Warrant are subject to adjustment from time to time as set forth in this section 2.

(a) Voluntary Adjustment By Company. The Company may at any time during the term of this Warrant, with the prior written consent of the Required Holders, reduce the then current Exercise Price to any amount and for any period of time deemed appropriate by the Board of Directors of the Company.

(b) Adjustment Upon Subdivision or Combination of Common Stock. If the Company at any time on or after the Subscription Date subdivides (by any stock split, stock dividend, recapitalization or otherwise) one or more classes of its outstanding Common Stock into a greater number of shares, the Exercise Price in effect immediately prior to such subdivision will be proportionately reduced and the number of Warrant Shares will be proportionately increased. If the Company at any time on or after the Subscription Date combines (by combination, reverse stock split or otherwise) one or more classes of its outstanding Common Stock into a smaller number of shares, the Exercise Price in effect immediately prior to such combination will be proportionately increased and the number of Warrant Shares will be proportionately decreased. Any adjustment under this Section 2(c) shall become effective at the close of business on the date the subdivision or combination becomes effective.

(c) Other Events. If any event occurs of the type contemplated by the provisions of this Section 2 but not expressly provided for by such provisions (including, without limitation, the granting of stock appreciation rights, phantom stock rights or other rights with equity features), then the Company's Board of Directors will make an appropriate adjustment in the Exercise Price and the number of Warrant Shares, as mutually determined by the Company's Board of Directors and the Required Holders, so as to protect the rights of the Holder; provided that no such adjustment pursuant to this Section 2(d) will increase the Exercise Price or decrease the number of Warrant Shares as otherwise determined pursuant to this Section 2.

3. RIGHTS UPON DISTRIBUTION OF ASSETS. In addition to any adjustments pursuant to Section 2 above, if the Company shall declare or make any dividend or other distribution of its assets (or rights to acquire its assets) to holders of shares of Common Stock, by way of return of capital or otherwise (including, without limitation, any distribution of cash, stock or other securities, property, options, evidence of indebtedness or any other assets by way of a dividend, spin off, reclassification, corporate rearrangement, scheme of arrangement or other similar transaction) (a "**Distribution**"), at any time after the issuance of this Warrant, then, in each such case, the Holder shall be entitled to participate in such Distribution to the same extent that the Holder would have participated therein if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for such Distribution, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the participation in such Distribution (provided, however, that to the extent that the Holder's right to participate in any such Distribution would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Distribution to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Distribution (and beneficial ownership) to the extent of any such excess) and the portion of such Distribution shall be held in abeyance for the benefit of the Holder until such time or times, if ever, as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such Distribution (and any Distributions declared or made on such initial Distribution or on any subsequent Distribution held similarly in abeyance) to the same extent as if there had been no such limitation).

4. PURCHASE RIGHTS; FUNDAMENTAL TRANSACTIONS.

(a) Purchase Rights. If at any time the Company grants, issues or sells any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property pro rata to the record holders of any class of Common Stock (the "**Purchase Rights**"), then the Holder will be entitled to acquire, upon the terms applicable to such Purchase Rights, the aggregate Purchase Rights which the Holder could have acquired if the Holder had held the number of shares of Common Stock acquirable upon complete exercise of this Warrant (without regard to any limitations or restrictions on exercise of this Warrant, including without limitation, the Maximum Percentage) immediately before the date on which a record is taken for the grant, issuance or sale of such Purchase Rights, or, if no such record is taken, the date as of which the record holders of shares of Common Stock are to be determined for the grant, issuance or sale of such Purchase Rights (provided, however, that to the extent that the Holder's right to participate in any such Purchase Right would result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, then the Holder shall not be entitled to participate in such Purchase Right to the extent of the Maximum Percentage (and shall not be entitled to beneficial ownership of such shares of Common Stock as a result of such Purchase Right (and beneficial ownership) to the extent of any such excess) and such Purchase Right to such extent shall be held in abeyance for the benefit of the Holder until such time or times, if ever, as its right thereto would not result in the Holder and the other Attribution Parties exceeding the Maximum Percentage, at which time or times the Holder shall be granted such right (and any Purchase Right granted, issued or sold on such initial Purchase Right or on any subsequent Purchase Right held similarly in abeyance) to the same extent as if there had been no such limitation).

(b) Fundamental Transactions. The Company shall cause any Successor Entity in a Fundamental Transaction to assume in writing all of the obligations of the Company under this Warrant in accordance with the provisions of this Section 4(b) Upon the consummation of each Fundamental Transaction, the Successor Entity shall succeed to, and be substituted for (so that from and after the date of the applicable Fundamental Transaction, the provisions of this Warrant referring to the "Company" shall refer instead to the Successor Entity), and may exercise every right and power of the Company and shall assume all of the obligations of the Company under this Warrant with the same effect as if such Successor Entity had been named as the Company herein. Upon consummation of each Fundamental Transaction, the Successor Entity shall deliver to the Holder confirmation that there shall be issued upon exercise of this Warrant at any time after the consummation of the applicable Fundamental Transaction, in lieu of the shares of Common Stock (or other securities, cash, assets or other property (except such items still issuable under Sections 1.1(a) and 4(a) above, which shall continue to be receivable thereafter)) issuable upon the exercise of this Warrant prior to the applicable Fundamental Transaction, such shares of common stock (or its equivalent) of the Successor Entity (including its Parent Entity, if applicable) which the Holder would have been entitled to receive upon the happening of the applicable Fundamental Transaction had this Warrant been exercised immediately prior to the applicable Fundamental Transaction (without regard to any limitations on the exercise of this Warrant), as adjusted in accordance with the provisions of this Warrant. Notwithstanding the foregoing, and without limiting Section 1(f) hereof, the Holder may elect, at its sole option, by delivery of written notice to the Company to waive this Section 4(b) to permit the Fundamental Transaction without the assumption of this Warrant. In addition to and not in substitution for

any other rights hereunder, prior to the consummation of each Fundamental Transaction pursuant to which holders of shares of Common Stock are entitled to receive securities or other assets with respect to or in exchange for shares of Common Stock (a "**Corporate Event**"), the Company shall make appropriate provision to insure that the Holder will thereafter have the right to receive upon an exercise of this Warrant at any time after the consummation of the applicable Fundamental Transaction but prior to the Expiration Date , in lieu of the shares of the Common Stock (or other securities, cash, assets or other property (except such items still issuable under Sections 1.1(a) and 4(a) above, which shall continue to be receivable thereafter)) issuable upon the exercise of the Warrant prior to such Fundamental Transaction , such shares of stock, securities, cash, assets or any other property whatsoever (including warrants or other purchase or subscription rights) which the Holder would have been entitled to receive upon the happening of the applicable Fundamental Transaction had this Warrant been exercised immediately prior to the applicable Fundamental Transaction (without regard to any limitations on the exercise of this Warrant).

(c) Application. The provisions of this Section 4 shall apply similarly and equally to successive Fundamental Transactions and Corporate Events and shall be applied as if this Warrant (and any such subsequent warrants) were fully exercisable and without regard to any limitations on the exercise of this Warrant (provided that the Holder shall continue to be entitled to the benefit of the Maximum Percentage, applied however with respect to shares of capital stock registered under the 1934 Act and thereafter receivable upon exercise of this Warrant (or any such other warrant)).

5. NONCIRCUMVENTION. The Company hereby covenants and agrees that the Company will not, by amendment of its certificate of incorporation, bylaws or other organizational documents or through any reorganization, transfer of assets, consolidation, merger, scheme of arrangement, dissolution, issuance or sale of securities, or any other voluntary action, avoid or seek to avoid the observance or performance of any of the terms of this Warrant, and will at all times in good faith carry out all the provisions of this Warrant and take all action as may be required to protect the rights of the Holder. Without limiting the generality of the foregoing, the Company (a) shall not increase the par value of any shares of Common Stock receivable upon the exercise of this Warrant above the Exercise Price then in effect, and (b) shall take all such actions as may be necessary or appropriate in order that the Company may validly and legally issue fully paid and non-assessable shares of Common Stock upon the exercise of this Warrant. Notwithstanding anything herein to the contrary, if after the sixty (60) calendar day anniversary of the Issuance Date, the Holder is not permitted to exercise this Warrant in full for any reason (other than pursuant to restrictions set forth in Section 1(f) hereof), the Company shall use its best efforts to promptly remedy such failure, including, without limitation, obtaining such consents or approvals as necessary to permit such exercise into shares of Common Stock.

6.

WARRANT HOLDER NOT DEEMED A STOCKHOLDER . Except as otherwise specifically provided herein, the Holder, solely in its capacity as a holder of this Warrant, shall not be entitled to vote or receive dividends or be deemed the holder of share capital of the Company for any purpose, nor shall anything contained in this Warrant be construed to confer upon the Holder, solely in its capacity as the Holder of this Warrant, any of the rights of a stockholder of the Company or any right to vote, give or withhold consent to any corporate

action (whether any reorganization, issue of stock, reclassification of stock, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, prior to the issuance to the Holder of the Warrant Shares which it is then entitled to receive upon the due exercise of this Warrant. In addition, nothing contained in this Warrant shall be construed as imposing any liabilities on the Holder to purchase any securities (upon exercise of this Warrant or otherwise) or as a stockholder of the Company, whether such liabilities are asserted by the Company or by creditors of the Company. Notwithstanding this Section 6, the Company shall provide the Holder with copies of the same notices and other information given to the stockholders of the Company generally, contemporaneously with the giving thereof to the stockholders.

7. REISSUANCE OF WARRANTS.

(a) Transfer of Warrant. If this Warrant is to be transferred, the Holder shall surrender this Warrant to the Company, whereupon the Company will forthwith issue and deliver upon the order of the Holder a new Warrant (in accordance with Section 7(d)), registered as the Holder may request, representing the right to purchase the number of Warrant Shares being transferred by the Holder and, if less than the total number of Warrant Shares then underlying this Warrant is being transferred, a new Warrant (in accordance with Section 7(d)) to the Holder representing the right to purchase the number of Warrant Shares not being transferred.

(b) Lost, Stolen or Mutilated Warrant. Upon receipt by the Company of evidence reasonably satisfactory to the Company of the loss, theft, destruction or mutilation of this Warrant (as to which a written certification and the indemnification contemplated below shall suffice as such evidence), and, in the case of loss, theft or destruction, of any indemnification undertaking by the Holder to the Company in customary and reasonable form and, in the case of mutilation, upon surrender and cancellation of this Warrant, the Company shall execute and deliver to the Holder a new Warrant (in accordance with Section 7(d)) representing the right to purchase the Warrant Shares then underlying this Warrant.

(c) Exchangeable for Multiple Warrants. This Warrant is exchangeable, upon the surrender hereof by the Holder at the principal office of the Company, for a new Warrant or Warrants (in accordance with Section 7(d)) representing in the aggregate the right to purchase the number of Warrant Shares then underlying this Warrant, and each such new Warrant will represent the right to purchase such portion of such Warrant Shares as is designated by the Holder at the time of such surrender; provided, however, no warrants for fractional shares of Common Stock shall be given.

(d) Issuance of New Warrants. Whenever the Company is required to issue a new Warrant pursuant to the terms of this Warrant, such new Warrant (i) shall be of like tenor with this Warrant, (ii) shall represent, as indicated on the face of such new Warrant, the right to purchase the Warrant Shares then underlying this Warrant (or in the case of a new Warrant being issued pursuant to Section 7(a) or Section 7(c), the Warrant Shares designated by the Holder which, when added to the number of shares of Common Stock underlying the other new Warrants issued in connection with such issuance, does not exceed the number of Warrant Shares then underlying this Warrant), (iii) shall have an issuance date, as indicated on the face of

such new Warrant which is the same as the Issuance Date, and (iv) shall have the same rights and conditions as this Warrant.

8. NOTICES. Whenever notice is required to be given under this Warrant, unless otherwise provided herein, such notice shall be given at its last address as it shall appear upon the warrant register of the Company. The Company shall provide the Holder with prompt written notice of all actions taken pursuant to this Warrant (other than the issuance of shares of Common Stock upon exercise in accordance with the terms hereof), including in reasonable detail a description of such action and the reason therefor. Without limiting the generality of the foregoing, the Company will give written notice to the Holder (i) immediately upon each adjustment of the Exercise Price and the number of Warrant Shares, setting forth in reasonable detail, and certifying, the calculation of such adjustment(s), (ii) at least ten Trading Days prior to the date on which the Company closes its books or takes a record (A) with respect to any dividend or distribution upon the shares of Common Stock, (B) with respect to any grants, issuances or sales of any Options, Convertible Securities or rights to purchase stock, warrants, securities or other property to holders of shares of Common Stock or (C) for determining rights to vote with respect to any Fundamental Transaction, dissolution or liquidation, provided in each case that such information shall be made known to the public prior to or in conjunction with such notice being provided to the Holder, and (iii) at least ten (10) Trading Days prior to the consummation of any Fundamental Transaction. To the extent that any notice provided hereunder constitutes, or contains, material, non-public information regarding the Company or any of its Subsidiaries, the Company shall simultaneously file such notice with the SEC pursuant to a Current Report on Form 8-K. If the Company or any of its Subsidiaries provides material non-public information to the Holder that is not simultaneously filed in a Current Report on Form 8-K and the Holder has not agreed to receive such material non-public information, the Company hereby covenants and agrees that the Holder shall not have any duty of confidentiality to the Company, any of its Subsidiaries or any of their respective officers, directors, employees, affiliates or agents with respect to, or a duty to any of the foregoing not to trade on the basis of, such material non-public information. It is expressly understood and agreed that the time of execution specified by the Holder in each Exercise Notice shall be definitive and may not be disputed or challenged by the Company.

9. AMENDMENT AND WAIVER. Except as otherwise provided herein, the provisions of this Warrant (other than Section 1(f)) may be amended and the Company may take any action herein prohibited, or omit to perform any act herein required to be performed by it, only if the Company has obtained the written consent of the Required Holders . Any such amendment shall apply to all Warrants and be binding upon all registered holders of such Warrants. No waiver shall be effective unless it is in writing and signed by an authorized representative of the waiving party or parties.

10. SEVERABILITY. If any provision of this Warrant is prohibited by law or otherwise determined to be invalid or unenforceable by a court of competent jurisdiction, the provision that would otherwise be prohibited, invalid or unenforceable shall be deemed amended to apply to the broadest extent that it would be valid and enforceable, and the invalidity or unenforceability of such provision shall not affect the validity of the remaining provisions of this Warrant so long as this Warrant as so modified continues to express, without material change, the original

intentions of the parties as to the subject matter hereof and the prohibited nature, invalidity or unenforceability of the provision(s) in question does not substantially impair the respective expectations or reciprocal obligations of the parties or the practical realization of the benefits that would otherwise be conferred upon the parties. The parties will endeavor in good faith negotiations to replace the prohibited, invalid or unenforceable provision(s) with a valid provision(s), the effect of which comes as close as possible to that of the prohibited, invalid or unenforceable provision(s).

11. GOVERNING LAW. This Warrant shall be governed by and construed and enforced in accordance with, and all questions concerning the construction, validity, interpretation and performance of this Warrant shall be governed by, the internal laws of the State of New York, without giving effect to any choice of law or conflict of law provision or rule (whether of the State of New York or any other jurisdictions) that would cause the application of the laws of any jurisdictions other than the State of New York. The Company hereby irrevocably waives personal service of process and consents to process being served in any such suit, action or proceeding by mailing a copy thereof to the Company at its principal executive office and agrees that such service shall constitute good and sufficient service of process and notice thereof. The Company hereby irrevocably submits to the exclusive jurisdiction of the state and federal courts sitting in The City of New York, Borough of Manhattan, for the adjudication of any dispute hereunder or in connection herewith or with any transaction contemplated hereby or discussed herein, and hereby irrevocably waives, and agrees not to assert in any suit, action or proceeding, any claim that it is not personally subject to the jurisdiction of any such court, that such suit, action or proceeding is brought in an inconvenient forum or that the venue of such suit, action or proceeding is improper. Nothing contained herein shall be deemed to limit in any way any right to serve process in any manner permitted by law. Nothing contained herein shall be deemed or operate to preclude the Holder from bringing suit or taking other legal action against the Company in any other jurisdiction to collect on the Company's obligations to the Holder, to realize on any collateral or any other security for such obligations, or to enforce a judgment or other court ruling in favor of the Holder. **THE COMPANY HEREBY IRREVOCABLY WAIVES ANY RIGHT IT MAY HAVE TO, AND AGREES NOT TO REQUEST, A JURY TRIAL FOR THE ADJUDICATION OF ANY DISPUTE HEREUNDER OR IN CONNECTION WITH OR ARISING OUT OF THIS WARRANT OR ANY TRANSACTION CONTEMPLATED HEREBY.**

12. CONSTRUCTION; HEADINGS. This Warrant shall be deemed to be jointly drafted by the Company and the Holder and shall not be construed against any Person as the drafter hereof. The headings of this Warrant are for convenience of reference and shall not form part of, or affect the interpretation of, this Warrant.

13. DISPUTE RESOLUTION.

(a) Submission to Dispute Resolution.

(i) In the case of a dispute relating to the Exercise Price, the Closing Sale Price, or fair market value or the arithmetic calculation of the number of Warrant Shares (as the case may be) (including, without limitation, a dispute relating to the determination of any of the foregoing), the Company or the Holder (as the case may be) shall submit the

dispute to the other party via facsimile (A) if by the Company, within two (2) Business Days after the occurrence of the circumstances giving rise to such dispute or (B) if by the Holder, at any time after the Holder learned of the circumstances giving rise to such dispute. If the Holder and the Company are unable to promptly resolve such dispute relating to such Exercise Price, such Closing Sale Price, or such fair market value or such arithmetic calculation of the number of Warrant Shares (as the case may be), at any time after the second (2^{nd}) Business Day following such initial notice by the Company or the Holder (as the case may be) of such dispute to the Company or the Holder (as the case may be), then the Holder may, at its sole option, select an independent, reputable investment bank to resolve such dispute.

(ii) The Holder and the Company shall each deliver to such investment bank (A) a copy of the initial dispute submission so delivered in accordance with the first sentence of this Section 13 and (B) written documentation supporting its position with respect to such dispute, in each case, no later than 5:00 p.m. (New York time) by the fifth (5^{th}) Business Day immediately following the date on which the Holder selected such investment bank (the "**Dispute Submission Deadline**") (the documents referred to in the immediately preceding clauses (A) and (B) are collectively referred to herein as the "**Required Dispute Documentation**") (it being understood and agreed that if either the Holder or the Company fails to so deliver all of the Required Dispute Documentation by the Dispute Submission Deadline, then the party who fails to so submit all of the Required Dispute Documentation shall no longer be entitled to (and hereby waives its right to) deliver or submit any written documentation or other support to such investment bank with respect to such dispute and such investment bank shall resolve such dispute based solely on the Required Dispute Documentation that was delivered to such investment bank prior to the Dispute Submission Deadline). Unless otherwise agreed to in writing by both the Company and the Holder or otherwise requested by such investment bank, neither the Company nor the Holder shall be entitled to deliver or submit any written documentation or other support to such investment bank in connection with such dispute (other than the Required Dispute Documentation).

(iii) The Company and the Holder shall cause such investment bank to determine the resolution of such dispute and notify the Company and the Holder of such resolution no later than ten (10) Business Days immediately following the Dispute Submission Deadline. The fees and expenses of such investment bank shall be borne solely by the Company, and such investment bank's resolution of such dispute shall be final and binding upon all parties absent manifest error.

(b) Miscellaneous. The Company expressly acknowledges and agrees that (i) this Section 13 constitutes an agreement to arbitrate between the Company and the Holder (and constitutes an arbitration agreement) under the rules then in effect under § 7501, et seq. of the New York Civil Practice Law and Rules ("**CPLR**") and that the Holder is authorized to apply for an order to compel arbitration pursuant to CPLR § 7503(a) in order to compel compliance with this Section 13, (ii) the Holder (and only the Holder), in its sole discretion, shall have the right to submit any dispute described in this Section 13 to any state or federal court sitting in The City of New York, Borough of Manhattan in lieu of utilizing the procedures set forth in this Section 13

and (iii) nothing in this Section 13 shall limit the Holder from obtaining any injunctive relief or other equitable remedies (including, without limitation, with respect to any matters described in this Section 13).

14. REMEDIES, CHARACTERIZATION, OTHER OBLIGATIONS, BREACHES AND INJUNCTIVE RELIEF . The remedies provided in this Warrant shall be cumulative and in addition to all other remedies available under this Warrant, at law or in equity (including a decree of specific performance and/or other injunctive relief), and nothing herein shall limit the right of the Holder to pursue actual and consequential damages for any failure by the Company to comply with the terms of this Warrant. The Company covenants to the Holder that there shall be no characterization concerning this instrument other than as expressly provided herein. Amounts set forth or provided for herein with respect to payments, exercises and the like (and the computation thereof) shall be the amounts to be received by the Holder and shall not, except as expressly provided herein, be subject to any other obligation of the Company (or the performance thereof). The Company acknowledges that a breach by it of its obligations hereunder will cause irreparable harm to the Holder and that the remedy at law for any such breach may be inadequate. The Company therefore agrees that, in the event of any such breach or threatened breach, the holder of this Warrant shall be entitled, in addition to all other available remedies, to an injunction restraining any breach, without the necessity of showing economic loss and without any bond or other security being required. The Company shall provide all information and documentation to the Holder that is requested by the Holder to enable the Holder to confirm the Company's compliance with the terms and conditions of this Warrant (including, without limitation, compliance with Section 2 hereof). The issuance of shares and certificates for shares as contemplated hereby upon the exercise of this Warrant shall be made without charge to the Holder or such shares for any issuance tax or other costs in respect thereof, provided that the Company shall not be required to pay any tax which may be payable in respect of any transfer involved in the issuance and delivery of any certificate in a name other than the Holder or its agent on its behalf.

15. PAYMENT OF COLLECTION, ENFORCEMENT AND OTHER COSTS . If (a) this Warrant is placed in the hands of an attorney for collection or enforcement or is collected or enforced through any legal proceeding or the holder otherwise takes action to collect amounts due under this Warrant or to enforce the provisions of this Warrant or (b) there occurs any bankruptcy, reorganization, receivership of the company or other proceedings affecting company creditors' rights and involving a claim under this Warrant, then the Company shall pay the reasonable and documented costs incurred by the Holder for such collection, enforcement or action or in connection with such bankruptcy, reorganization, receivership or other proceeding, including, without limitation, reasonable and documented attorneys' fees and disbursements.

16. TRANSFER. This Warrant may be offered for sale, sold, transferred or assigned without the consent of the Company.

17. CERTAIN DEFINITIONS. For purposes of this Warrant, the following terms shall have the following meanings:

(a) "**1933 Act**" means the Securities Act of 1933, as amended, and the rules and regulations thereunder.

(b) "**1934 Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations thereunder.

(c) "**Affiliate**" means, with respect to any Person, any other Person that directly or indirectly controls, is controlled by, or is under common control with, such Person, it being understood for purposes of this definition that "control" of a Person means the power directly or indirectly either to vote 10% or more of the stock having ordinary voting power for the election of directors of such Person or direct or cause the direction of the management and policies of such Person whether by contract or otherwise.

(d) "**Attribution Parties**" means, collectively, the following Persons and entities: (i) any investment vehicle, including, any funds, feeder funds or managed accounts, currently, or from time to time after the Issuance Date, directly or indirectly managed or advised by the Holder's investment manager or any of its Affiliates or principals, (ii) any direct or indirect Affiliates of the Holder or any of the foregoing, (iii) any Person acting or who could be deemed to be acting as a Group together with the Holder or any of the foregoing and (iv) any other Persons whose beneficial ownership of the Common Stock would or could be aggregated with the Holder's and the other Attribution Parties for purposes of Section 13(d) of the 1934 Act. For clarity, the purpose of the foregoing is to subject collectively the Holder and all other Attribution Parties to the Maximum Percentage.

(e) "**Bloomberg**" means Bloomberg, L.P.

(f) "**Business Day**" means any day other than Saturday, Sunday or other day on which commercial banks in The City of New York are authorized or required by law to remain closed.

(g) "**Closing Sale Price**" means, for any security as of any date, the last closing trade price for such security on the Principal Market, as reported by Bloomberg, or, if the Principal Market begins to operate on an extended hours basis and does not designate the closing trade price, then the last trade price of such security prior to 4:00:00 p.m., New York time, as reported by Bloomberg, or, if the Principal Market is not the principal securities exchange or trading market for such security, the last trade price of such security on the principal securities exchange or trading market where such security is listed or traded as reported by Bloomberg, or if the foregoing does not apply, the last trade price of such security in the over-the-counter market on the electronic bulletin board for such security as reported by Bloomberg, or, if no last trade price is reported for such security by Bloomberg, the average of the ask prices of any market makers for such security as reported in the OTC Pink Market maintained by OTC Markets Group Inc.. If the Closing Sale Price cannot be calculated for a security on a particular date on any of the foregoing bases, the Closing Sale Price of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 13. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination or other similar transaction during such period.

(h) "**Common Stock**" means (i) the Company's shares of common stock, $0.0002 par value per share, and (ii) any capital stock into which such common stock shall have been changed or any share capital resulting from a reclassification of such common stock.

(i) "**Convertible Securities**" means any stock or other security (other than Options) that is at any time and under any circumstances, directly or indirectly, convertible into, exercisable or exchangeable for, or which otherwise entitles the holder thereof to acquire, any shares of Common Stock.

(j) "**Eligible Market**" means The New York Stock Exchange, the NYSE MKT, the Nasdaq Global Select Market, the Nasdaq Global Market , or the Principal Market.

(k) "**Expiration Date**" means the date that is the fifth (5^{th}) anniversary of the Initial Exercise Date or, if such date falls on a day other than a Trading Day or on which trading does not take place on the Principal Market (a "**Holiday**"), the next date that is not a Holiday.

(l) "**Fundamental Transaction**" means (A) that the Company shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, (i) consolidate or merge with or into (whether or not the Company is the surviving corporation) another Subject Entity, or (ii) sell, assign, transfer, convey or otherwise dispose of all or substantially all of the properties or assets of the Company or any of its "significant subsidiaries" (as defined in Rule 1-02 of Regulation S-X) to one or more Subject Entities, or (iii) make, or allow one or more Subject Entities to make, or allow the Company to be subject to or have its Common Stock be subject to or party to one or more Subject Entities making, a purchase, tender or exchange offer that is accepted by the holders of at least 50% of the outstanding shares of Common Stock, or (iv) consummate a stock or share purchase agreement or other business combination (including, without limitation, a reorganization, recapitalization, spin-off or scheme of arrangement) with one or more Subject Entities whereby all such Subject Entities, individually or in the aggregate, acquire, at least 50% of the outstanding shares of Common Stock, , (B) that the Company shall, directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, allow any Subject Entity individually or the Subject Entities in the aggregate to be or become the "beneficial owner" (as defined in Rule 13d-3 under the 1934 Act), directly or indirectly, whether through acquisition, purchase, assignment, conveyance, tender, tender offer, exchange, reduction in outstanding shares of Common Stock, merger, consolidation, business combination, reorganization, recapitalization, spin-off, scheme of arrangement, reorganization, recapitalization or reclassification or otherwise in any manner whatsoever, of at least 50% of the aggregate ordinary voting power represented by issued and outstanding Common Stock, or (C) directly or indirectly, including through subsidiaries, Affiliates or otherwise, in one or more related transactions, the issuance of or the entering into any other instrument or transaction structured in a manner to circumvent, or that circumvents, the intent of this definition in which case this definition shall be construed and implemented in a manner otherwise than in strict conformity with the terms of this definition to the extent necessary to correct this definition or any portion of this definition which may be defective or inconsistent with the intended treatment of such instrument or transaction.

(m) "**Group**" means a "group" as that term is used in Section 13(d) of the 1934 Act and as defined in Rule 13d-5 thereunder.

(n) "**Options**" means any rights, warrants or options to subscribe for or purchase shares of Common Stock or Convertible Securities.

(o) "**Parent Entity**" of a Person means an entity that, directly or indirectly, controls the applicable Person and whose common stock or equivalent equity security is quoted or listed on an Eligible Market, or, if there is more than one such Person or Parent Entity, the Person or Parent Entity with the largest public market capitalization as of the date of consummation of the Fundamental Transaction.

(p) "**Person**" means an individual, a limited liability company, a partnership, a joint venture, a corporation, a trust, an unincorporated organization, any other entity or a government or any department or agency thereof.

(q) "**Principal Market**" means the Nasdaq Capital Market, or if the Company's Common Stock is not then listed on the Nasdaq Capital Market, such exchange or quotation system on which the Common Stock then primarily trades.

(r) "**Required Holders**" means, as of any date, the holders of at least a majority of the Warrant Shares underlying the Warrants outstanding as of such date.

(s) "**SEC**" means the United States Securities and Exchange Commission or the successor thereto.

(t) **"Subject Entity**" means any Person, Persons or Group or any Affiliate or associate of any such Person, Persons or Group.

(u) "**Subsidiary**" means any Person in which the Company, directly or indirectly, (i) owns any of the outstanding capital stock or holds any equity or similar interest of such Person or (ii) controls or operates all or any part of the business, operations or administration of such Person.

(v) "**Successor Entity**" means the Person (or, if so elected by the Holder, the Parent Entity) formed by, resulting from or surviving any Fundamental Transaction or the Person (or, if so elected by the Holder, the Parent Entity) with which such Fundamental Transaction shall have been entered into.

(w) "**Trading Day**" means, as applicable, (x) with respect to all price or trading volume determinations relating to the Common Stock, any day on which the Common Stock is traded on the Principal Market, or, if the Principal Market is not the principal trading market for the Common Stock, then on the principal securities exchange or securities market on which the Common Stock is then traded, provided that "Trading Day" shall not include any day on which the Common Stock is scheduled to trade on such exchange or market for less than 4.5 hours or any day that the Common Stock is suspended from trading during the final hour of trading on such exchange or market (or if such exchange or market does not designate in advance the closing time of trading on such exchange or market, then during the hour ending at 4:00:00 p.m., New York time) unless such day is otherwise designated as a Trading Day in writing by the Holder or (y) with respect to all determinations other than price determinations relating to the

Common Stock, any day on which The New York Stock Exchange (or any successor thereto) is open for trading of securities.

(x) "**VWAP**" means, for any security as of any date, the dollar volume-weighted average price for such security on the Principal Market (or, if the Principal Market is not the principal trading market for such security, then on the principal securities exchange or securities market on which such security is then traded) during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg through its " HP" function (set to weighted average) or, if the foregoing does not apply, the dollar volume-weighted average price of such security in the over-the-counter market on the electronic bulletin board for such security during the period beginning at 9:30:01 a.m., New York time, and ending at 4:00:00 p.m., New York time, as reported by Bloomberg, or, if no dollar volume-weighted average price is reported for such security by Bloomberg for such hours, the average of the highest closing bid price and the lowest closing ask price of any of the market makers for such security as reported in the "pink sheets" by OTC Markets Group Inc. (formerly Pink Sheets LLC). If the VWAP cannot be calculated for such security on such date on any of the foregoing bases, the VWAP of such security on such date shall be the fair market value as mutually determined by the Company and the Holder. If the Company and the Holder are unable to agree upon the fair market value of such security, then such dispute shall be resolved in accordance with the procedures in Section 13. All such determinations shall be appropriately adjusted for any stock dividend, stock split, stock combination, recapitalization or other similar transaction during such period.

[*signature page follows*]

IN WITNESS WHEREOF, the Company has caused this Warrant to Purchase Common Stock to be duly executed as of the Issuance Date set out above.

HEAT BIOLOGICS, INC.

By: _____
Name:
Title:

EXHIBIT A

EXERCISE NOTICE

TO BE EXECUTED BY THE REGISTERED HOLDER TO EXERCISE THIS SERIES [●] WARRANT TO PURCHASE COMMON STOCK

HEAT BIOLOGICS, INC.

The undersigned holder (the "**Holder**") hereby exercises the right to purchase _____ of the shares of Common Stock ("**Warrant Shares**") of Heat Biologics, Inc., a Delaware corporation (the "**Company**"), evidenced by Warrant to Purchase Common Stock No. _____ (the "**Warrant**"). Capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Warrant.

1. Form of Exercise Price. The Holder intends that payment of the Aggregate Exercise Price shall be made as:

_____ a "Cash Exercise" with respect to _____ Warrant Shares; and/or

_____ a "Cashless Exercise" with respect to _____ Warrant Shares.

2. Payment of Exercise Price. In the event that the Holder has elected a Cash Exercise with respect to some or all of the Warrant Shares to be issued pursuant hereto, the Holder shall pay the Aggregate Exercise Price in the sum of $_____ to the Company in accordance with the terms of the Warrant.

3. Maximum Percentage Representation. Notwithstanding anything to the contrary contained herein, this Exercise Notice shall constitute a representation by the Holder that after giving effect to the exercise provided for in this Exercise Notice, such Holder (together with the other Attribution Parties) will not have beneficial ownership (together with the other Attribution Parties) of a number of shares of Common Stock which exceeds the Maximum Percentage (as defined in the Warrant) of the total outstanding shares of Common Stock of the Company as determined pursuant to the provisions of Section 1(f) of the Warrant.

4. Delivery of Warrant Shares. The Company shall deliver to Holder, or its designee or agent as specified below, _____ Warrant Shares in accordance with the terms of the Warrant. Delivery shall be made to Holder, or for its benefit, as follows:

☐ Check here if requesting delivery as a certificate to the following name and to the following address:

Issue to: _____

_____

_____

☐ Check here if requesting delivery by Deposit/Withdrawal at Custodian as follows:

DTC Participant: _____

DTC Number: _____

Account Number: _____

Date: _____ __, _____

_____
Name of Registered Holder

By: _____
Name:
Title:

Tax ID:_____

Facsimile:_____

E-mail Address:_____

EXHIBIT B

ACKNOWLEDGMENT

The Company hereby acknowledges this Exercise Notice and hereby directs Continental Stock Transfer & Trust Company (the " Transfer Agent") to issue the above indicated number of shares of Common Stock in accordance with the Transfer Agent Instructions dated March [●], 2016, from the Company and acknowledged and agreed to by the Transfer Agent.

HEAT BIOLOGICS, INC.

By: _____
Name:
Title:

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Heat Biologics, Inc.
Durham, North Carolina

We hereby consent to the use in the Prospectus constituting a part of this Registration Statement of our report dated February 18, 2016, relating to the consolidated financial statements of Heat Biologics, Inc., which are contained in that Prospectus. Our report contains an explanatory paragraph regarding the Company's ability to continue as a going concern.

We also consent to the reference to us under the caption "Experts" in the Prospectus.

/s/ BDO USA, LLP

Raleigh, North Carolina
March 9, 2016