As filed with the Securities and Exchange Commission on May 30, 2013

Registration No. 333-188365

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

Amendment No. 1 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	**541700**	**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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100 Europa Drive
Chapel Hill, North Carolina 27517
(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.
100 Europa Drive
Chapel Hill, North Carolina 27517
(919) 240-7133
(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

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599 Lexington Avenue
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(212) 521-5400

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)(3)	$22,770,000	$3,106
Representative's Warrants(4)	—	—
Shares of Common Stock underlying Representative's Warrants (2)(5)	$1,237,500	$169
Total	$24,007,500	$3,275 (6)

(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.

(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) Includes shares of common stock the underwriters have the option to purchase to cover over-allotments, if any.

(4) No fee pursuant to Rule 457(g) under the Securities Act of 1933, as amended.

(5) Estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(g) under the Securities Act of 1933, as amended. The representative's warrants are exercisable at a per share exercise price equal to 125% of the public offering price per share. As estimated solely for the purpose of calculating the registration fee pursuant to Rule 457(g) under the Securities Act of 1933, as amended, the proposed maximum aggregate offering price of the representative's warrants is $1,237,500 which is equal to 125% of $990,000 (5% of $19,800,000).

(6) The Registrant previously paid $2,730 in connection with the filing of this Registration Statement on May 3, 2013.

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.

1,650,000 Shares
Common Stock

This is a firm commitment initial public offering of 1,650,000 shares of common stock by Heat Biologics, Inc. No public market currently exists for our shares. We anticipate that the initial public offering price per share of our shares of common stock will be between $10.00 and $12.00 per share.

We effected a 1-for-2.3 reverse stock split of our outstanding common stock on May 29, 2013. We have applied to list our common stock on the NASDAQ Capital Market under the symbol "HTBX." No assurance can be given that our application will be approved.

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, may elect to comply with certain reduced public company reporting requirements for future filings.

Investing in our common stock involves risk. See "Risk Factors" beginning on page 10 of this prospectus for a discussion of information that should be considered in connection with an investment in our common stock.

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	Total
Public offering price	$	$
Discounts and commissions to underwriters (1)	$	$
Offering proceeds to us, before expenses	$	$

(1) Does not include a non-accountable expense allowance equal to 1% of the gross proceeds of this offering payable to Aegis Capital Corp., the representative of the underwriters. See "Underwriting" beginning on page 103 of this prospectus for a description of compensation payable to the underwriters.

We have granted a 45-day option to the underwriters to purchase up to 247,500 additional shares of common stock solely to cover over-allotments, if any.

The underwriters expect to deliver our shares to purchasers in the offering on or about , 2013.

Sole Book-Running Manager

Aegis Capital Corp

Co-Manager

Cantor Fitzgerald & Co.

, 2013

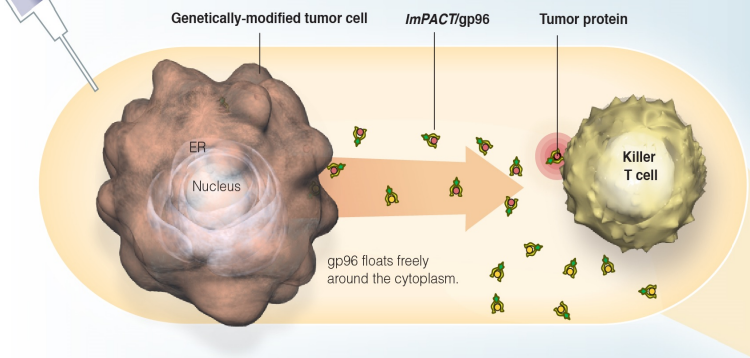
Heat Biologics

***ImPACT* TECHNOLOGY**

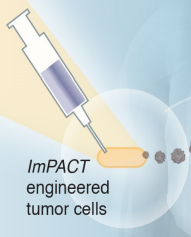
Heat Biologics' proprietary Immune Pan Antigen Cytotoxic Therapy *(ImPACT)* reprograms live "allogeneic" cancer cells to continually secrete their own antigens bound to heat shock protein gp96 to seek out and destroy a variety of tumors.

How *ImPACT* Technology Works

Live allogeneic tumor cells are genetically modified to continually "pump-out" their own cancer antigens bound to gp96, a natural adjuvant. These live *ImPACT* tumor cells are injected into the patient to stimulate a powerful immune response against the targeted cancer.



Vaccine injection



ImPACT engineered tumor cells

Killer T cells

1 Heat Biologics creates **genetically modified tumor cell lines** that continually secrete their own mutated antigens bound to gp96.

2 The **immune system recognizes the mutated antigens** secreted by the injected tumor cells.

3 The gp96 acts as an adjuvant, **supercharging the patient's immune system** against the *ImPACT* secreted antigens.

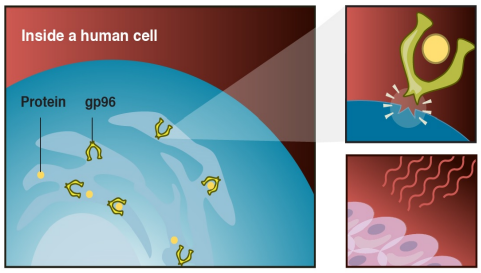
4 Secreted proteins **activate killer T cells** to destroy any mutated tumor proteins that it carried out of the tumor cell.

5 The killer T cells then **seek out and destroy** the patient's live tumor cells.

Some killer T cells become long-living memory cells used to fight metastatic and recurrent cancers.

What is gp96?

gp96 is a "heat shock" protein resident in all human cells. It assists these cells in folding proteins they produce. gp96 is tethered to the cell and is normally only released during "necrosis", or unnatural cell death.



What is *ImPACT* Technology?

Heat Biologics "severs the leash" that binds gp96 to the cell, thus creating modified living cells that continually secrete gp96 bound to the proteins produced by the cell.

These modified tumor cells are then mass-produced and irradiated to prevent them from replicating when injected into the patient.

ImPACT Therapy Highlights

- Initiates a pan-antigen cytotoxic T-cell attack against the targeted cancer
- Generates a significant adjuvant response
- Targets a wide variety of cancers

ImPACT is an allogeneic, "off-the-shelf" cancer therapy. In contrast to other "autologous" cancer therapies, no invasive procedure to remove patient tumor or immune cells is required.

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You should rely only on the information contained in this prospectus. Neither we nor the underwriters have authorized anyone to provide you with information different from that contained in this prospectus. We are offering to sell, and seeking offers to buy, shares of our common stock 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 shares of our common stock.

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. and Heat Biologics GmbH. In June 2012, we divested our 92.5% interest in Heat Biologics II, Inc. The divestiture resulted in Heat Biologics II, Inc. being classified as discontinued operations in our consolidated financial statements for the years ended December 31, 2012 and 2011 and for the three months ended March 31, 2012 (unaudited), and for the period June 10, 2008 (inception) through March 31, 2013 (unaudited).

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 shares of common stock and the distribution of this prospectus outside of the United States.

PROSPECTUS SUMMARY

This summary highlights information contained elsewhere in this prospectus. This summary is not complete and does not contain all of the information that you should consider before deciding to invest in our securities. We urge you to read this entire prospectus carefully, especially the "Risk Factors" section. 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, and, where appropriate, its subsidiaries, Heat Biologics I, Inc. Heat Biologics III, Inc., Heat Biologics IV, Inc. and Heat Biologics GmbH. Unless otherwise included, all share amounts and per share amounts in this prospectus have been presented on a pro forma basis to reflect the reverse stock split of our outstanding shares of common stock at a ratio of 1-for-2.3, that we effected on May 29, 2013.

Heat Biologics

Overview

We are a development stage biopharmaceutical company engaged in the development of novel allogeneic, "off-the-shelf" cellular therapeutic vaccines to combat a wide range of cancers and infectious diseases. Our proprietary *ImPACT*™ Immune Pan Antigen Cytotoxic Therapy is being designed to deliver live, genetically-modified, irradiated human cells which are reprogrammed to "pump out" a broad spectrum of cancer-associated antigens together with a potent immune adjuvant called "gp96" to educate and activate a cancer patient's immune system to recognize and kill cancerous cells. We intend for our *ImPACT* cells to secrete an antigen-adjuvant complex that generates anti-cancer immune responses in patients by mobilizing and activating cytotoxic "killer" T cells that target multiple cancer antigens, thus harnessing a patient's own immune system to fight cancer.

Unlike autologous or "personalized" therapeutic vaccine approaches which require extraction and processing of cancer or blood from each individual patient, our *ImPACT* therapeutic vaccine uses a master cell line containing a host of known and unknown tumor associated antigens to mass-produce a single vaccine product applicable to all patients with a particular cancer type. We believe our off-the-shelf, allogeneic immunotherapy offers logistical, manufacturing and cost benefits compared to autologous patient-specific approaches.

Our primary product candidates are HS-110 and HS-410.

HS-110

We have submitted an IND to initiate a Phase 2 clinical trial in non-small cell lung cancer (NSCLC) patients with our therapeutic vaccine candidate HS-110, which is derived from a human lung cancer cell line. HS-110 is a biologic product which consists of 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 a gp96 adjuvant and is designed to activate a T-cell mediated pan-antigen immune response against the patient's cancer. The inventor of the *ImPACT* technology that we license recently 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. Eighteen 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.

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. HS-110 provides evidence of 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), 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 is surviving over four years since starting the therapy and another patient is surviving over three years since starting the therapy. These findings were consistent with multiple pre-clinical published studies on *ImPACT* therapy.

HS-410

We intend to submit an IND to initiate a Phase 1/2 bladder cancer trial with HS-410, which is derived from a human bladder cancer cell line. HS-410 is a biologic product which consists of a bladder cancer cell line which has been genetically modified using our *ImPACT* technology platform to secrete a wide range of bladder cancer antigens bound to a gp96 adjuvant and is designed to activate a T-cell mediated pan-antigen immune response against the patient's bladder cancer. Following FDA clearance, we intend to initiate a 93 patient, Phase 1/2 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 and 6 weekly intravesical bacillus Calmet-Guerin (BCG) immunotherapy installations. We anticipate including approximately 8-10 clinical sites with an enrollment period of 12-18 months. Patient enrollment is expected to begin in the third quarter of 2013.

Additional Indications

We are also developing *ImPACT* therapeutic vaccines for breast cancer and ovarian cancer. The inventor of the *ImPACT* technology intends to initiate a second grant-funded, investigator-sponsored Phase 1/2 clinical trial of ImPACT therapy in conjunction with other therapies against NSCLC in the second quarter of 2013. To date, in excess of $14,000,000 of funding has been awarded to the primary inventor of the technology that we license by the National Institutes of Health (NIH) and through other research and clinical grants, which has been used to further develop the *ImPACT* technology platform. The NIH is also currently fully funding the primary inventor's study of an HS-HIV product candidate in non-human primates with a therapeutic and prophylactic vaccine for the treatment and prevention of HIV utilizing the *ImPACT* approach.

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

Product Candidate	Indication	Phase of Development	Upcoming Milestone(s)
HS-110	Non-Small Cell Lung Cancer (NSCLC)	Open commercial IND	2013 - Initiate Phase 2
HS-410	Bladder Cancer Adjuvant	IND submission planned. Completing cGMP Drug Manufacturing	2013 - Initiate Phase 1/2
HS-310	Ovarian Cancer	Pre-clinical. Initiating cGMP Drug Manufacturing	2014 - Phase 1/2 trials
HS-510	Triple Negative Breast Cancer (TNBC)	Pre-clinical. Cell line development underway	2014 - Phase 1/2 trials

The table below summarizes the primary inventor's clinical development of the *ImPACT* technology:

Product Candidate	Indication	Phase of Development
HS-110	Non-Small Cell Lung Cancer (NSCLC)	Completed Phase 1 Interim Study Report
HS-110	Non-Small Cell Lung Cancer (NSCLC) Combination Therapy	Completed cGMP Drug Manufacturing. 2013 - Initiate Phase 1/2
HS-HIV	HIV	Pre-clinical. NIH-sponsored Primate Studies Completed

Our intellectual property portfolio consists of 5 patent families representing at least 37 pending applications in the U.S. and worldwide, with enforceable patents in 13 countries. This portfolio includes patents and proprietary rights around (i) our drug candidates and (ii) *ImPACT* -focused intellectual property, which includes early and broad filings on therapeutic vaccines utilizing cells secreting heat shock proteins.

***ImPACT* Therapy—Novel Pan-Antigen Immune Activation**

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, human-derived, genetically-modified attenuated cells that generate an array of tumor associated antigens complexed to a secreted immunostimulatory protein called "gp96", a heat shock protein. The secreted antigen and adjuvant complex are designed to generate a potent immune response to cancer cells by mobilizing and activating a patient's own killer T cells to recognize and attack a broad array of different tumor antigens with the goal of eliminating cancer cells. In contrast to other vaccine technologies that target only single cancer antigens, *ImPACT's* pan-antigen approach is designed to enable the patient to induce and maintain an immune response against a broad array of tumor-specific proteins, by potentially providing a more robust immune response and limiting cancer cells' ability to evade the immune system. We believe that the clinical and pre-clinical results of the trials conducted by the inventor of the technology we license suggest that *ImPACT* generates anti-tumor immune responses. We believe these responses may be capable of targeting tumors and maintaining remission. We plan to study our novel, off-the-shelf, live attenuated cell therapy not only as therapy for a wide range of cancers, but also to treat various infectious diseases, such as hepatitis C, malaria and HIV. NIH-funded non-human primate studies of *ImPACT* for HIV conducted by the inventor of our technology, which we believe are encouraging, have been completed.

Recent Developments

In March 2013, we sold an aggregate of 1,891,419 shares of our Series B-1 Preferred Stock for gross proceeds of $5,050,090 in our Series B Preferred Stock private placement. All shares of the Series B Preferred Stock, together with accrued dividends, automatically convert into 828,889 shares of our common stock upon the consummation of a firm commitment underwritten public offering resulting in aggregate net cash proceeds to us of at least $15,000,000 (a "Qualified Public Offering"). In addition, upon consummation of a Qualified Public Offering, the investors in our Series B-1 Preferred Stock will be issued an aggregate of 32,879 shares of common stock (assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus), and our obligation to issue, and the investors, obligation to purchase, Series B-2 Preferred Stock and warrants upon fulfillment of certain conditions specified in our stock purchase agreement dated as of March 25, 2013 entered into in connection with such private placement (the "Stock Purchase Agreement") will terminate.

Strengths and Competitive Advantages

We believe that the following are key investment attributes of our company:

- We believe our *ImPACT* technology combines broad antigen targeting of known and unknown tumor associated antigens complexed with a potent immune adjuvant. We believe *ImPACT* has been shown to activate the immune system against a wide variety of antigens by eliciting a significant cytotoxic T cell immune response as measured by extensive pre-clinical and initial clinical immunological testing. The activated immune response generated by our *ImPACT* Therapy may be useful in treating a wide range of cancers and infectious diseases.
- We have submitted an IND and intend to initiate a Phase 2 clinical trial in NSCLC patients with our therapeutic vaccine candidate HS-110, which is derived from a genetically-modified human lung cancer cell line. We expect to initiate a Phase 1/2 clinical trial for bladder cancer with our second product candidate, HS-410, in 2H-2013.
- The National Institute of Health (NIH) and other organizations have provided significant funding to the primary inventor of the technology that we license for both his pre-clinical and clinical studies.
- Our proprietary *ImPACT* technology platform is being applied to develop multiple therapeutic vaccines against a wide range of cancers and infectious diseases. Generating positive results and gaining FDA approval for multiple therapies would lower our dependence on any one drug in order to generate returns.

- 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.
- We believe that we may be able *to rapidly develop new allogeneic vaccines for different types of cancers* and other diseases as our technology has the potential to be applied to many different forms of cancer.
- *Our therapies do not require an additional adjuvant.* 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.
- *We believe our business model is capital efficient* as we continue to leverage academic and institutional resources in order to develop new products and to begin to move these products into and through clinical trials.

Our Strategy

Our strategy is to utilize our novel *ImPACT* technology platform to produce a pipeline of novel immunotherapies for the treatment of various cancers and infectious diseases and rapidly and efficiently progress these products through clinical trials towards regulatory approval. Our near term strategy includes attempting to achieve the following:

- *Develop and obtain regulatory approval for our ImPACT-based products;*
- *Maximize commercial opportunity for our ImPACT technology;*
- *Further expand our broad patent portfolio;*
- *Manage our business with efficiency and discipline;*
- *Obtain additional grant funding to more fully develop our ImPACT technology platform and its application to a variety of human diseases*; *and*
- *Continue to leverage and fortify our intellectual property portfolio in the US and worldwide.*

Corporate Information

We were incorporated on June 10, 2008 under the laws of the State of Delaware under the name Heat Biologics, Inc. Our executive offices are located at 100 Europa Drive, Chapel Hill, North Carolina 27517 and our telephone number is (919) 240-7133. 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 part of this prospectus.

References to Heat Biologics also include references to our subsidiaries Heat Biologics I, Inc. (of which we own a 92.5% interest), Heat Biologics III, Inc., Heat Biologics IV, Inc. and Heat Biologics GmbH unless otherwise indicated. In June 2012, we divested our 92.5% interest in Heat Biologics II, Inc., which resulted in Heat Biologics II, Inc. being classified as discontinued operations in our consolidated financial statements for the years ended December 31, 2012 and 2011. On May 30, 2012, we formed two wholly-owned subsidiaries, Heat Biologics III, Inc. and Heat Biologics IV, Inc. We assigned our proprietary rights related to the development and application of our *ImPACT* Therapy for the treatment of non-small lung cancer to Heat Biologics III, Inc. and our proprietary rights related to the development and application of our *ImPACT* Therapy to the treatment of bladder cancer to Heat Biologics IV, Inc.

The Offering

Common stock offered by us(1)	1,650,000 shares
Over-allotment option	We have granted the underwriters a 45-day option to purchase up to 247,500 additional shares of our common stock from us at the initial public offering price less underwriting discounts and commissions. The option may be exercised only to cover any over-allotments
Common stock outstanding after the offering	5,233,654 shares (or 5,481,154 shares if the underwriters exercise their over-allotment option in full)
Use of Proceeds	We estimate that the net proceeds from our sale of shares of our common stock in this offering will be approximately $16.4 million, or approximately $18.9 million if the underwriters exercise their over-allotment option in full, based upon an assumed initial public offering price of $11.00 per share, which is the midpoint of the range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us. We expect to use the net proceeds from this offering as follows: · approximately $8,350,000 to complete our Phase 2 clinical trials for HS-110 against non-small lung cancer and the submission of related materials to the FDA or an equivalent amount as grant matching funds to fund an expanded clinical trial; · approximately $1,000,000 for initiation and completion of Phase 1 clinical trials of HS-410 against bladder cancer; · approximately $100,000 to enhance the scope of and pay regulatory fees for our HS-110 lung cancer investigator-sponsored trial to test the use of HS-110 as a combination therapy against lung cancer; · approximately $1,500,000 to fund one to two additional Phase 1 clinical trials on additional cancer indications; · $300,000 to repay the portion of the loan from Square 1 Bank that is due and payable in the next eighteen months which is estimated to be $300,000; and · the remaining net proceeds will be used for general corporate purposes, including ongoing operations and expansion of the business, further research and development, vendor payables, potential regulatory submissions and hiring additional sales and marketing personnel to support increased sales and marketing activities." See "Use of Proceeds."
Risk Factors	See the section entitled "Risk Factors" beginning on page 10 of this prospectus for a discussion of factors you should carefully consider before deciding to invest in our common stock.
Proposed NASDAQ Capital Market symbol	HTBX

The number of shares of our common stock that will be outstanding immediately after this offering is based on3,583,654 shares of common stock outstanding as of May 21, 2013, and assumes that all outstanding shares of our convertible Preferred Stock convert into shares of our common stock upon the closing of this initial public offering and excludes:

- 662,543 shares of our common stock issuable upon the exercise of stock options as of May 21, 2013, with a weighted average exercise price of $1.60 per share;
- 53,159 additional shares of our common stock issuable upon the exercise of outstanding warrants as of May 21, 2013, at a weighted average exercise price of $2.16 per share; and
- 84,314 additional shares of our common stock reserved for future issuance under our equity incentive plans as of May 21, 2013.

Except for historical financial information or as otherwise indicated herein, all information in this prospectus, including the number of shares that will be outstanding after this offering, assumes or gives effect to:

- the conversion of all outstanding shares of our convertible Preferred Stock and the accrued dividends thereof into an aggregate of 1,688,906 shares of our common stock which will occur automatically upon the closing of this offering;
- the issuance of an aggregate of 32,879 shares of common stock to the investors of our Series B-1 Preferred Stock, (having a value of $361,668 assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus), and which will occur automatically upon the closing of this offering;
- no exercise by the underwriters of their option to purchase up to 247,500 additional shares of our common stock from us in this offering; and
- no exercise of the warrants granted to Aegis Capital Corp upon completion of this offering.

We effected a 1-for-2.3 reverse stock split on May 29, 2013. Unless we indicate otherwise, all references to numbers of shares of our common stock in this prospectus reflect the effects of this reverse stock split.

SUMMARY CONSOLIDATED FINANCIAL DATA

The following table sets forth our summary statement of operations data for the years ended December 31, 2012 and 2011, and inception through December 31, 2012, derived from our audited consolidated financial statements and related notes included elsewhere in this prospectus and our summary statement of operations data for the three months ended March 31, 2012 and 2013, and the balance sheet data as of March 31, 2013 from our unaudited consolidated financial statements and related notes included elsewhere in this prospectus. In our opinion, such unaudited consolidated financial statements include all adjustments consisting of only normal recurring adjustments that we consider necessary for a fair presentation of the financial information set forth in those statements. Our consolidated financial statements are prepared and presented in accordance with generally accepted accounting principles in the United States. Our historical results are not necessarily indicative of the results to be expected for any future periods and our interim results are not necessarily indicative of the results to be expected for the full fiscal year. Pro forma net loss per common share and the pro forma balance sheet data have been calculated assuming the conversion of all outstanding shares of our Preferred Stock into 1,688,906 shares of common stock upon completion of this offeringand the issuance of an additional 32,879 shares of common stock to the investors of our Series B-1 Preferred Stock, having a value of $361,668 assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this Prospectus, and which will occur automatically upon completion of this offering. The pro forma as adjusted balance sheet data reflects the balance sheet data at March 31, 2013 as adjusted to reflect our receipt of the net proceeds from the sale by us in this offering of1,650,000 shares of common stock at an assumed initial public offering price of $11.00 per share, the midpoint of the estimated price range set forth on the cover page of this prospectus, after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us and conversion of all of our outstanding shares of Preferred Stock into 1,688,906 shares of common stock upon completion of this offering, the issuance of an additional 32,879 shares of common stock to the investors of our Series B-1 Preferred Stock, having a value of $361,668 assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus, and which will occur automatically upon completion this offering and the repayment of certain indebtedness. You should read this information together with the sections entitled "Capitalization," "Selected Consolidated Financial Data," "Management's Discussion and Analysis of Financial Condition & Results of Operations" and our consolidated financial statements and related notes included elsewhere in this prospectus.

Statement of Operations Data:

	For the Year Ended December 31,		For the Three Months Ended March 31,		Since Inception Through March 31,
	2012	2011	2013	2012	2013
			(Unaudited)		(Unaudited)
Revenues	$ 3,110	$ 187,787	$ —	$ —	$ 585,589
Total Operating Expenses	2,345,787	2,222,587	770,482	443,629	6,851,333
Loss from Operations Before Non-Operating Expenses	(2,342,677)	(2,034,800)	(770,482)	(443,629)	(6,265,744)
Non-Operating Expenses	(108,341)	(64,182)	(17,979)	(3,419)	(245,536)
Loss from Discontinued Operations	(20,129)	(14,160)	—	(1,100)	(288,724)
Net loss	$ (2,471,147)	$ (2,113,142)	$ (788,461)	$ (448,148)	$ (6,800,004)
Less: Net loss non-controlling interest	(50,947)	(8,258)	(24,605)	(6,464)	(100,866)
Net loss attributable to Heat Biologics, Inc. and subsidiaries	$ (2,420,200)	$ (2,104,884)	$ (763,856)	$ (441,684)	$ (6,699,138)
Net (loss) per share:					
Basic	$ (1.32)	$ (1.15)	$ (0.41)	$ (0.24)	
Diluted	$ (1.32)	$ (1.15)	$ (0.41)	$ (0.24)	
Weighted average shares of common stock outstanding used in computing net (loss) per share:					
Basic	1,831,769	1,824,927	1,859,929	1,830,597	
Diluted	1,831,769	1,824,927	1,859,929	1,830,597	
Pro forma net (loss) per share of common stock:					
Basic	$ (0.47)	$ (0.41)	$ (0.15)	$ (0.08)	
Diluted	$ (0.47)	$ (0.41)	$ (0.15)	$ (0.08)	
Weighted average shares of common stock outstanding used in computing pro forma net (loss) per share:					
Basic	5,203,554	5,196,712	5,231,714	5,202,382	
Diluted	5,203,554	5,196,712	5,231,714	5,202,382	

Balance Sheet Data:

	As of March 31, 2013	
	Actual	Pro Forma As Adjusted(1)
	(Unaudited)	
Cash and Cash Equivalents	$ 4,889,723	$ 20,989,723
Total Current Assets	5,102,966	21,202,966
Total Assets	5,175,969	21,275,969
Total Current Liabilities	1,373,043	1,073,043
Long Term Liabilities	1,158,934	1,158,934
Total Stockholders' Equity	$ 2,643,992	$ 19,043,992

(1) A $1.00 increase (decrease) in the assumed initial public offering price of$11.00 per share of our common stock, the midpoint of the estimated price range set forth on the cover of this prospectus, would increase (decrease) each of cash, total assets, and total stockholders' equity (deficit) by $1,518,000 assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

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 start-up entity and have had limited operations to date. As a start-up entity, we are 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, as described herein, 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 or even to make quarter to quarter comparisons of our operating results. You 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 development-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 pre-clinical development and initiate 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, the Company, to date, has not successfully initiated any clinical trials and has no experience conducting or enrolling patients in clinical trials. Our operations have been limited to organizing and staffing the Company, acquiring, developing and securing our proprietary technology and undertaking pre-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.

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 U.S. Food and Drug Administration, or 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 and capital expenditures from cash on hand, grants, and, potentially, future offerings. At the conclusion of this offering, we believe we will have cash on hand to fund our Phase 2 clinical trial for NSCLC, and our Phase 1/2 clinical trial for bladder cancer. However, changes may occur that would consume our available capital before that time, including changes in and progress of our development activities, acquisitions of additional candidates and changes in regulation. Moreover, pre-clinical studies and clinical trials may not start or be completed as we forecast and may not achieve the desired results.

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

For the three months ended March 31, 2013 and March 31, 2012, we incurred a net loss attributable to Heat Biologics, Inc. and Subsidiaries of ($763,856) and ($441,684), respectively. For the years ended December 31, 2012 and December 31, 2011, we incurred a net loss of ($2,420,200) and ($2,104,884), respectively. We have also incurred an accumulated deficit since inception of ($6,699,138). We may 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 the 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 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 and capital expenditures and anticipate that our expenses will increase substantially in the foreseeable future as we:

- continue to undertake pre-clinical development and initiate 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 and capital expenditures. As a result, we will need to generate significant revenues 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 could prevent us from continuing as a going concern.

If we default on our secured loans with Square 1 Bank, we would 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 merger and acquisitions. 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 would result in our licenses reverting back to our licensor and would 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 U.S. 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 U.S. 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 Biologics License Application, or BLA, demonstrating that the product candidate is safe, pure and potent, or effective for its intended use. This demonstration requires significant research including pre-clinical 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 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 pre-clinical 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. We cannot assure you that we will receive the approvals necessary to commercialize our product candidate 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 pre-clinical and clinical testing. Only one product candidate is currently ready for 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 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 pre-clinical 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 pre-clinical testing. For example, the only clinical study conducted to date with one of our product candidates by the inventor of the technology that we license showed evidence of an immune response in late-stage NSCLC patients exposed to HS-110. However, our future HS-110 trials will use doses and dosing regimens which have previously been tested in only 0 to 3 subjects, and will be conducted in patients with less advanced disease who may have different responses. In addition, immune response is not an acceptable regulatory endpoint for approval, and no actual clinical or tumor responses were observed in that study. Moreover, the HS-110 Phase 1 trial involved a small sample size, was not blinded and was sponsored by an individual who has a significant financial interest in the success of the product candidate. 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 at any time if it appears that we are exposing participants to unacceptable health risks 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. We intend to submit the protocol for our planned Phase 2 trial of HS-110 to FDA in 2H-2013.

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 forseeable 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 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 pre-clinical and 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.

To date, in excess of $14,000,000 of funding has been awarded by the NIH to the primary inventor of the technology we license. We have little control over the direction of the NIH grant funds that have been received by the primary inventor of the technology we license and since payment is made to the inventor as opposed to us we do not recognize any revenue from such grant funds nor do they fund any expenses that we incur.

Although earmarked for further development of the technology that we license, any funds awarded to the primary inventor are used in his discretion and we have little control over his use of the funds.

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

We have no experience in the formulation, development or manufacturing of biologics and do not intend to establish our own manufacturing facilities. We lack the resources and expertise to formulate or manufacture our own product candidates. The investigational product for our planned Phase 1 and Phase 2 clinical trials are manufactured by our contractors under current good manufacturing practices, or cGMPs and we have entered into an agreement with another manufacturer for the manufacture and supply of investigational product for additional Phase 2 and any Phase 3 clinical trials and commercialization efforts We must also develop and

validate a potency assay prior to submission of a license application. Such assays have proven difficult to develop for cell-based products and must be established prior to initiating any Phase 3 clinical trials. While we are currently utilizing gp96 ELISA as our potency assay, this is unlikely to be adequate for licensure, and as necessary, we will rely on contract manufacturers for further development and validation of a potency assay which will support our license application. 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, if any, we will need 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. For example, the manufacturer of the clinical trial material we intend to use for any future Phase 3 trials of HS-110 and of our commercial product, if approved, is a different manufacturer from the manufacturer of the inventor's completed Phase 1 trial of HS-110 and portions of our planned initial Phase 2 trial of HS-110. Accordingly, the third stage of our planned Phase 2 trial of HS-110 will evaluate the comparability of HS-110 produced by the two different manufacturers.
- 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 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 may 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 result in higher costs or deprive us of potential product revenues.

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 adverse events 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.

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;
- 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 pre-clinical 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 of 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 such protection does not prevent unauthorized use of such technology. 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 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 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 which 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 continues 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 2020, 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, 2013, 2014, 2015, 2016, 2017 and thereafter through December 31, 2022 our minimum royalty obligations under our licensing agreements, required to be paid with the passage of time, are $30,000, $30,000, $30,000, $30,000, $280,000 and $150,000, 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 vaccines, 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 vaccines. 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. U.S. and foreign governments, for example, continue to propose and pass legislation designed to reduce the cost of healthcare. In some foreign markets, the government controls the pricing and profitability of prescription pharmaceuticals. In the U.S., 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 pre-clinical 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 up to 10 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.

Some of our officers are currently working for the Company on a part-time basis. Several of the part-time employees also work at other jobs and have discretion to decide what time they devote to our activities, which may result in a lack of availability when needed due to responsibilities at other jobs. We expect that some of these officers may join the Company on a full-time basis at the completion of this offering, but there can be no assurance given that any or all of our officers will be so employed.

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 United States 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 this Offering

Upon the sale of the shares offered in this prospectus, our Preferred Stock will convert into shares of common stock

Holders of our Preferred Stock have several rights that our common shareholders do not have such as preference on payment of dividends and liquidation distributions, the right to elect a certain number of directors, the right to adjustment in the event that securities are issued at a price per share less than that paid by the holders of the Preferred Stock. Our Third Amended and Restated Certificate of Incorporation provides that our Preferred Stock automatically converts to common stock upon the earlier of: (i) a closing of a firm commitment underwritten public offering pursuant to an effective registration statement under the Securities Act of 1933, as amended, resulting in at least $15,000,000 of net proceeds to us; (ii) with respect to the Series 1 Preferred Stock, written consent or agreement of at least two-thirds of the then outstanding shares of Series 1 Preferred Stock; (iii) with respect to the Series A Preferred Stock, written consent or agreement of at least two-thirds of the then outstanding shares of Series A Preferred Stock (which must include the lead investor if it meets certain criteria); (iv) with respect to the Series B-1 Preferred Stock, written consent or agreement of at least two-thirds of the then outstanding shares of Series B-1 Preferred Stock; and (v) with respect to the Series B-2 Preferred Stock, written consent or agreement of at least two-thirds of the then outstanding shares of Series B-2 Preferred Stock. Upon the conversion of the Preferred Stock the holders of common stock will experience additional dilution.

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.

Our officers and directors together will control approximately 41.3% of our outstanding common stock on a fully diluted basis after consummation of this offering assuming the issuance of all 1,650,000 shares of common stock offered in this offering. Mr. Wolf alone through his direct and indirect holdings will control approximately 25.3% of our outstanding common stock on a fully diluted basis after consummation of this offering assuming the issuance of all 1,650,000 shares of common stock offered in this offering. 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, 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 under which we may grant awards to purchase 869,565 shares of our common stock, of which, 662,543 options were outstanding as of May 21, 2013. In addition, as of May 21, 2013, we have 53,159 shares issuable upon exercise of warrants granted to third parties in connection with prior private placements of our equity securities and debt. 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. The common stock and preferred stock, as well as the awards available for issuance under the 2009 Stock Option and Restricted Stock Plan, can be issued by our board of directors, without stockholder approval. Any future issuances of such stock would further dilute the percentage ownership of us held by holders of Preferred Stock and common stock. The classes of Preferred Stock that are currently outstanding, which will convert to common stock upon consummation of this offering, rank ahead of our common stock in terms of dividends, liquidation rights and voting rights and could adversely affect the voting power and the rights of our holders of 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. See "Dividend Policy."

Shareholders purchasing shares in this offering will experience immediate and substantial dilution, causing their investment to immediately be worth less than their purchase price.

If you purchase common stock in this offering, you will experience an immediate and substantial dilution in the projected book value of the common stock from the price you pay in this offering.

After consummation of this offering and assuming the consummation of this offering and conversion of all of the outstanding Preferred Stock exclusive of the over-allotment option, you will have an immediate dilution of $7.36 per common share and an immediate increase in net tangible book value to our present shareholders from $0.74 to $3.64 per share will occur.

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 shareholders 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 our becoming a public company, we will become subject to additional reporting and corporate governance requirements that will require additional management time, resources and expense.

In connection with this filing, we will become obligated to file with the U.S. Securities and Exchange Commission annual and quarterly information and other reports that are specified in the U.S. Securities Exchange Act of 1934, as amended, or the Exchange Act. We will also become 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 will impose significant compliance and reporting obligations upon us and require us to incur additional expense in order to fulfill such obligations.

We have identified material weaknesses in our internal controls, and we cannot provide assurances that these weaknesses will be effectively remediated or that additional material weaknesses will not occur in the future. If our internal control over financial reporting or our disclosure controls and procedures are not effective, we may not be able to accurately report our financial results, prevent fraud, or file our periodic reports in a timely manner, which may cause investors to lose confidence in our reported financial information and may lead to a decline in our stock price.

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting, as defined in Rule 13a-15(f) under the Exchange Act. We have historically operated as a private company and the number and qualifications of our finance and accounting staff have not been consistent with those of a public company. We have identified material weaknesses in our internal controls with respect to our financial statement closing process of our consolidated financial statements for the years ended December 31, 2012 and 2011. Our management discovered certain conditions that we deemed to be material weaknesses and significant deficiencies in our internal controls, as follows:

- A lack of accounting and finance resources as well as effective oversight by those in charge of governance resulted in insufficient controls over timely financial statement preparation and review as well as the preparation and review around accounting for certain complex transactions.
- The design of monitoring controls used to assess the design and operating effectiveness of our internal controls is inadequate. We also do not have an adequate internal process to report deficiencies in internal control to management on a timely basis.

We have begun to take actions that we believe will substantially remediate the material weaknesses identified. In response to the identification of our material weaknesses, we: (i) have retained a part-time Chief Financial Officer to segregate the duties of Chief Executive Officer and Chief Financial Officer; (ii) are in the process of establishing a review process for key aspects of our financial reporting process, including the accounting for complex transactions; and (iii) will seek to establish better operating controls and involve our board of directors in our internal controls process, which will involve establishing formal procedures to communicate deficiencies in internal controls on a timely basis, and encourage our board of directors to more actively participate in guiding management as it relates to internal controls matters. However, we cannot assure you that our internal control over financial reporting, as modified, will enable us to identify or avoid material weaknesses in the future. Regardless, following the completion of this offering we will be required to expend time and resources to further improve our internal controls over financial reporting, including by expanding our finance and accounting staff.

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

The Company will have a significant number of restricted shares that will become eligible for sale shortly after this registration statement is declared effective. We currently have 1,861,869 shares of our common stock outstanding, 1,975,628 shares of Series A and Series 1 Preferred Stock outstanding that converts to 860,017 shares of common stock, 1,891,419 shares of Series B-1 Preferred Stock outstanding that together with accrued dividends converts to 828,889 shares of common stock and an additional 32,879 shares of common stock that will be issued to investors of our Series B-1 Preferred Stock upon consummation of this offering (assuming an initial public offering of $11.00 per share, which is the midpoint of the range set forth on the cover page of this prospectus), all of which will be restricted securities. All of the 1,650,000 shares sold in this offering will be eligible for sale immediately upon effectiveness of this registration statement. All of the remaining shares will be eligible for sale in the public market upon expiration of lock-up agreements 180 days after the date, of this prospectus, 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 following the holding period, many shareholders may wish to sell some or all of their shares. If our shareholders 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 shareholders 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 you to lose part or all of your investment in our shares of common stock.

Our common stock may be thinly traded, so you may be unable to sell at or near ask prices or at all if you need to sell your shares to raise money or otherwise desire to liquidate your shares.

Prior to this offering, you could not buy or sell our common stock publicly. We cannot predict the extent to which investors' interests will lead to an active trading market for our common stock or whether the market price of our common stock will be volatile following this offering. If an active trading market does not develop, investors may have difficulty selling any of our common stock that they buy. There may be limited market activity in our stock and we are likely to be too small to attract the interest of many brokerage firms and analysts. We cannot give you any assurance that a public trading market for our common stock will develop or be sustained. The market price of our common stock could be subject to wide fluctuations in response to quarterly variations in our revenues and operating expenses, announcements of new products or services by us, significant sales of our common stock, including "short" sales, the operating and stock price performance of other companies that investors may deem comparable to us, and news reports relating to trends in our markets or general economic conditions.

The offering price of the shares may not be indicative of the value of our assets or the price at which shares can be resold.

The offering price of the common stock may not be an indication of our actual value. Prior to this offering, there has been no public market for our securities. The offering price of $11.00 per share was determined based upon negotiations between the underwriters and us. Factors considered in determining such price in addition to prevailing market conditions include an assessment of our future prospects, an increase in value of our stock due to becoming a public company and prior valuations of certain minority interests prepared for us. Such price does not have any relationship to any established criteria of value, such as book value or earnings per share. Such price is not indicative of the current market value of our assets. No assurance can be given that the shares can be resold at the public offering price.

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 believe that the proceeds derived from the sale of the shares in this offering will provide us with sufficient working capital to fund our Phase 2 clinical trial for Non-Small Cell Lung Cancer and our Phase 1 clinical trial for bladder cancer. Thereafter, we expect to require additional funds in the future to conduct additional clinical trials even if the maximum amount is raised in this offering. There are no other commitments by any person for future financing other than a loan from Square 1 Bank for an amount up to $3,000,000; however in order to continue to borrow under the loan there are several conditions which must be met and there can be no assurance that we will meet such conditions or be able to borrow the entire $3,000,000. There can be no assurance given that we will meet these closing conditions. Through May 21, 2013, we have outstanding $725,000 under our loan from Square 1 Bank. Our securities may be offered to other investors at a price lower than the price per share offered to the investors in the offering, or upon terms which may be deemed more favorable than offered hereunder. In addition, the issuance of securities in this offering as well as any future financing using our securities may dilute an investor's equity ownership. 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, including the investors in this offering. 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.

We have adopted certain measures that may have anti-takeover effects which may make an acquisition of our Company by another company more difficult.

We have adopted, and may in the future adopt, certain measures that may have the effect of delaying, deferring or preventing a takeover or other change in control of our Company that a holder of our common stock might not consider in its best interest. Our certificate of incorporation and bylaws contain provisions which may have anti-takeover effects. These include: (a) requiring that certain shareholder groups elect a certain number of directors for so long as certain shares of preferred stock remain outstanding; (b) requiring that for so long as any shares of Preferred Stock remain outstanding a majority of each of the Series B Preferred shareholders, Series A Preferred shareholders, the Series 1 Preferred shareholders and the common shareholders approve certain actions including: (i) amendments to our bylaws or certificate of incorporation, unless in connection with a Qualified Public Offering; (ii) creation of additional classes of stock or increases in the authorized shares of an existing class of stock unless they rank junior to the Series A Preferred Stock with respect to the distribution of assets on liquidation and the

payment of dividends, reclassification stock or redemption of stock, unless in connection with a Qualified Public Offering; (iii) action to reclassify, alter or amend existing securities that are junior to or *pari passu* with the Series A Preferred if such action would render such security senior to or*pari passu* with the Series A Preferred Stock in respect of the distribution of assets upon liquidation or payment of a dividend other than with respect to a firm commitment underwritten public offering with net proceeds to us of at least $15,000,000, unless in connection with a Qualified Public Offering; (iv) purchase or redeem or otherwise declare or pay a dividend, unless in connection with a Qualified Public Offering; (v) action to liquidate or sell all or; (vi) substantially all of our assets; (c) requiring that for so long as a majority of the originally issued shares of Series B Preferred Stock remain outstanding and until we receive $20,000,000 through financing, grant or a licensing or joint venture agreement a majority of Series B Preferred shareholders must give prior approval of certain actions including: (i) operation of any business other than our business as carried out on the date the Series B-1 Preferred Stock was originally issued; (ii) making of a loan to any entity or subsidiary other than an 80% owned subsidiary, (iii) disposition or acquisition of an interest in a business (except to the extent that prior approval of the board of directors is received including the director nominated by the Series B Preferred Stockholders); (iv) entering into a joint venture or making an investment in excess of $5,000,000 (except to the extent that prior approval of the board of directors is received including the director nominated by the Series B Preferred Stockholders); (v) making or committing to make an expenditure of $5,000,000 or more (except to the extent that prior approval of the board of directors is received including the director nominated by the Series B Preferred Stockholders); (vi) making a loan of in excess of $5,000 (except to the extent that prior approval of the board of directors is received including the director nominated by the Series B Preferred Stockholders); (vii) issuing debt in excess of $5,000,000 other than under existing agreements (except to the extent that prior approval of the board of directors is received including the director nominated by the Series B Preferred Stockholders); and (viii) an annual budget. These measures and those described above may have the effect of delaying, deferring or preventing a takeover or other change in control of the Company that a holder of our common stock might consider in its best interest.

In addition, 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 management will have broad discretion over the use of the proceeds we receive in this offering, and may not apply the proceeds in ways that increase the value of your investment.

If the underwriters exercise their option to purchase additional shares in this offering in full, we estimate that net proceeds of the sale of the common stock that we are offering will be approximately $18.9 million. Our management will have broad discretion to use the net proceeds from this offering, and you will be relying on the judgment of our management regarding the application of these proceeds. Although we intend to use a portion of the net proceeds from this offering for research, development and commercialization of our products and payment of outstanding indebtedness, because of the number and variability of factors that will determine our use of the net proceeds from this offering, we cannot specify with certainty the particular use of the net proceeds that we will receive from this offering, and we cannot assure you that we will use the proceeds in a manner that will increase the value of your investment or of which you would approve. Moreover, you will not have the opportunity to influence our decision on how to use the proceeds from this offering. We may use the proceeds for corporate purposes that do not immediately enhance our prospects for the future or increase the value of your investment. See the Section entitled “Use of Proceeds.”

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 maintain our present customer base and retain new customers;
- 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 a sufficient qualified personnel;
- our ability 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 we will receive net proceeds of approximately $16.4 million from the sale of shares of common stock offered in this offering, or approximately $18.9 million if the underwriters exercise their over-allotment option in full, based on an assumed initial public offering price of $11.00 per share (the midpoint of the price range set forth on the cover page of this prospectus) and after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 increase (decrease) in the assumed initial public offering price of$11.00 per share (the midpoint of the price range set forth on the cover page of this prospectus) would increase (decrease) the net proceeds to us from this offering, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $1,518,000 assuming that the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same. We may also increase or decrease the number of shares we are offering. An increase (decrease) of 330,000 in the number of shares we are offering would increase (decrease) the net proceeds to us from this offering, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $3.3 million, assuming the initial public offering price per share stays the same. An increase of 330,000 in the number of shares we are offering, together with a $1.00 increase in the assumed initial public offering price per share, would increase the net proceeds to us from this offering, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $5.2 million. A decrease of 330,000 in the number of shares we are offering, together with a $1.00 decrease in the assumed initial public offering price per share, would decrease the net proceeds to us from this offering, after deducting the estimated underwriting discounts and commissions and estimated offering expenses payable by us, by approximately $4.6 million. The foregoing assumes no exercise of the underwriters' over-allotment option. We do not expect that a change in the offering price per share or the number of shares by these amounts would have a material effect on our intended uses of the net proceeds from this offering, although it may impact the amount of time prior to which we may need to seek additional capital.

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

- approximately $8,350,000 to complete our Phase 2 clinical trials for HS-110 against non-small lung cancer and the submission of related materials to the FDA or an equivalent amount as grant matching funds to fund an expanded clinical trial. We plan to initiate a 125 patient Phase 2 trial on patients with advanced non-small cell lung cancer. Our Phase 2 study has been designed as a maintenance therapy study in patients with Stage III/IV NSCLC who have completed a 1st line regimen consisting of a platinum doublet, crizotinib or erlotinib and achieved at least stable disease. We plan to use up to approximately $8.35 million from the net proceeds of this offering to finance this trial. We have applied for grant funding to enable us to expand the size and scope of this clinical trial and if the grant funding is received, will use up the $8.35 million of the net proceeds from this offering as "matching funds" as required by the granting organization to expand the size and scope of our trial. There can be no assurance that the grant funding will be received. If sufficient grant funding is not received by the commencement of the trial to fund the trial, we will use the net proceeds of this offering to provide the needed funding for a 125 patient Phase 2 trial;
- approximately $1,000,000 for initiation and completion of Phase 1/2 clinical trials of HS-410 against bladder cancer. We plan to file an IND for use of HS-410 to prevent the recurrence of bladder cancer. This initial IND will include a 93 patient, Phase 1/2 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 and 6 weekly intravesical bacillus Calmet-Guerin (BCG) immunotherapy installations. We plan to use approximately $1 million from the net proceeds of this offering to enhance the scope of this trial as currently designed and funded;
- approximately $100,000 to enhance the scope of and pay regulatory fees for ourHS-110 lung cancer investigator-sponsored trial to test the use of HS-110 as a combination therapy against lung cancer. Our HS-110 lung cancer trial is an investigator-sponsored trial to test the use of HS-110 as a combination therapy against lung cancer. While the trial is fully-funded by the Marcus Foundation, we plan to use approximately $100,000 to enhance to scope of this trial and prepare appropriate regulatory filings;

- approximately $1,500,000 to fund one to two additional Phase 1 clinical trials on additional cancer indications. We are creating and have created *ImPACT*-based drugs against additional cancers and plan to use approximately $1.5 million from the net proceeds of this offering to fund one to two additional Phase 1 clinical trials on additional cancer indications;
- $300,000 to repay the portion of the loan from Square 1 Bank that is due and payable in the next eighteen months. We plan to use approximately $300,000 of the net proceeds of this offering to repay the portion of the loans from Square 1 Bank that is due and payable in the next eighteen months. One loan from Square 1 Bank is payable on September 7, 2013 in 36 monthly installments of principal and interest. The other loan is payable on August 7, 2013 and August 7, 2014 for 5% of the outstanding principal and accrued interest each and then the remaining principal and accrued interest is due December 14, 2014. Both loans accrue interest monthly at an interest rate of 3% plus prime or 6% per annum whichever is greater. Finally, the last loan is payable as interest only until January 9, 2014 when the entire principal balance is due and it accrues interest monthly at an interest rate of 4.25% per annum. As of May 21, 2013, we had outstanding $725,000 under the Square 1 Bank loans; and
- the remaining net proceeds will be used for general corporate purposes, including ongoing operations, vendor payables and expansion of the business, further research and development, potential regulatory submissions and hiring additional sales and marketing personnel to support increased sales and marketing activities.

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.

CAPITALIZATION

The following table sets forth ourcash and cash equivalents as well as capitalization as of March 31, 2013:

- on an actual basis;
- on a pro forma basis as of March 31, 2013, to reflect the automatic conversion upon the closing of this offering of all outstanding shares of Preferred Stock including accrued dividends into 1,688,906 shares of common stock and to reflect the issuance of an additional 32,879 shares of common stock to the investors of our Series B-1 Preferred Stock, having a value of $ 361,668 assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus, and which will occur automatically upon completion of this offering;
- on a pro forma as-adjusted basis to(i) give effect to the sale of 1,650,000 shares of the common stock we are offering at an assumed initial public offering price of $11.00 per share, which is the midpoint of the estimated price range shown on the cover page of this prospectus, after deducting underwriting discounts and commissions and estimated offering expenses payable by us and (ii) the use of $300,000 in proceeds to repay the portion of the loan from Square 1 Bank that is due and payable within the next 18 months. The pro forma as-adjusted column assumes no exercise by the underwriters of their over-allotment option.

The information below is illustrative only and our capitalization following the completion of this offering will be adjusted based on the actual initial public price. You should read this table together with the sections entitled “Use of Proceeds” and “Management’s Discussion and Analysis of Financial Condition and Results of Operations” as well as our financial statements and the related notes, which appear elsewhere in this prospectus.

	As of March 31, 2013 (unaudited)		
($ in thousands)	Actual	Pro Forma	Pro Forma As Adjusted(1)
Cash and cash equivalents	$ 4,889,723	$ 4,889,723	$ 20,989,723
Long term debt, including current portion	1,390,106	1,390,106	1,090,106
Convertible Preferred Stock, Series A 2,000,000 shares authorized, 1,863,128 shares issued and outstanding, actual; 2,000,000 shares authorized, no shares issued and outstanding, pro forma; 2,000,000 shares authorized, no shares issued and outstanding, pro forma as adjusted	186	—	—
Convertible Preferred Stock, Series 1 112,500 shares authorized, 112,500 shares issued and outstanding, actual; 112,500 shares authorized, no shares issued and outstanding, pro forma; 112,500 shares authorized, no shares issued and outstanding, pro forma as adjusted	11	—	—
Convertible Preferred Stock, Series B 4,100,000 shares authorized, 1,891,419 shares issued and outstanding, actual; 4,100,000 shares authorized, no shares issued and outstanding, pro forma; 4,100,000 shares authorized, no shares issued and outstanding, pro forma as adjusted	189	—	—

	As of March 31, 2013 (unaudited)		
($ in thousands)	Actual	Pro Forma	Pro Forma As Adjusted(1)
Common stock, additional paid-in capital and treasury stock 50,000,000 shares authorized, 2,144,533 and 1,861,137 shares issued and outstanding, respectively, actual; 50,000,000 shares authorized, 1,861,869 shares issued and outstanding, pro forma; 50,000,000 shares authorized, 3,583,654 shares issued and outstanding, pro forma as adjusted 5,233,654	405	799	1,129
Additional paid in capital	9,443,205	9,443,197	25,842,867
Accumulated deficit	(6,699,138)	(6,699,138)	(6,699,138)
Non-Controlling Interest	(100,866)	(100,866)	(100,866)
Total stockholders' equity	2,643,992	2,643,992	19,043,992
Total capitalization	$ 4,034,098	$ 4,034,098	$ 20,143,098

(1) A $1.00 increase (decrease) in the assumed initial public offering price of $11.00 per share of our common stock, the midpoint of the estimated price range set forth on the cover page of this prospectus, in this offering would increase (decrease) each of cash, total stockholders' deficit and total capitalization by $1,518,000 assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same, and after deducting estimated underwriting discounts and commissions and estimated offering expenses payable by us.

The number of shares of common stock to be outstanding after the offering is based on the number of shares outstanding as of March 31, 2013, and excludes:

- 662,543 shares of our common stock issuable upon the exercise of stock options as of May 21, 2013, with a weighted average exercise price of $1.60 per share;
- 53,159 additional shares of our common stock issuable upon the exercise of outstanding warrants as of May 21, 2013, at a weighted average exercise price of $2.16 per share;
- 84,314 additional shares of our common stock reserved for future issuance under our equity incentive plans as of May 21, 2013;
- up to 247,500 additional shares of common stock issuable upon exercise of the underwriters' over-allotment option; and
- 82,500 shares of our common stock issuable upon exercise of the warrants granted to Aegis Capital Corp. upon completion of this offering.

DILUTION

If you invest in our common stock in this offering, your ownership interest will be diluted to the extent of the difference between the initial public offering price per share of our common stock in this offering and our pro forma as adjusted net tangible book value per share immediately after this offering. We calculate net tangible book value per share by dividing our net tangible book value, which is tangible assets less total liabilities less debt discounts related to debt to be paid or converted as a result of this offering, by the number of outstanding shares of our common stock. Prior to considering the effects of the proceeds of this offering, but giving effect to the automatic conversion of our outstanding shares of Series A, Series 1 and Series B Preferred Stock into 1,688,906 shares of our common stock upon completion of this offering and the issuance of an additional 32,879 shares of common stock to the investors of our Series B-1 Preferred Stock, having a value of $361,668 assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus, and which will occur automatically upon completion of this offering, our pro forma net tangible book value (deficit) as of March 31, 2013 was approximately $2,643,992 million, or approximately $0.74 per share. Upon completion of this offering, our pro forma as adjusted net tangible book value as of March 31, 2013 will be approximately $19,043,992 million or approximately $3.64 per share. This represents an immediate increase in pro forma net tangible book value of $2.90 per share to our existing stockholders and an immediate dilution of $7.36 per share to new investors purchasing our common stock in this offering. The following table illustrates the per share dilution:

Assumed initial public offering price per share		$ 11.00
Pro forma net tangible book value per share as of March 31, 2013	$ 0.74	
Increase in pro forma net tangible book value per share after this offering	$ 2.90	
Pro forma as adjusted net tangible book value per share after this offering		3.64
Dilution in pro forma net tangible book value per share to new investors		$ 7.36

Each $1.00 increase in the assumed initial public offering price of $11.00 per share, the midpoint of the range set forth on the cover page of this prospectus, would increase our pro forma as adjusted net tangible book value by approximately $1.518 million, the pro forma as adjusted net tangible book value per share by approximately $0.29 per share and the dilution to investors purchasing shares of our common stock in this offering by approximately $0.67 per share, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

Each $1.00 decrease in the assumed initial public offering price of $11.00 per share, the midpoint of the range set forth on the cover page of this prospectus, would decrease our pro forma as adjusted net tangible book value by approximately $1.518 million, the pro forma as adjusted net tangible book value per share by approximately $0.29 per share and the dilution to investors purchasing shares of our common stock in this offering by approximately $0.67 per share, assuming the number of shares offered by us, as set forth on the cover page of this prospectus, remains the same and after deducting the underwriting discounts and commissions and estimated offering expenses payable by us.

The information above assumes that the underwriters do not exercise their over-allotment option. If the underwriters exercise their over-allotment option in full, the pro forma as adjusted net tangible book value will increase to $3.93 per share, representing an immediate increase in pro forma as adjusted net tangible book value to existing stockholders of $3.93 per share and an immediate dilution of $7.07 per share to new investors. If any shares are issued upon exercise of outstanding options or warrants, new investors will experience further dilution.

The following table summarizes, on a pro forma as adjusted basis as ofMarch 31, 2013, the differences between the number of shares of common stock purchased from us, the total consideration and the average price per share paid by existing stockholders and by investors participating in this offering, after deducting estimated underwriting discounts and commissions and estimated offering expenses, at an assumed initial public offering price of $11.00 per share, the midpoint of the estimated price range shown on the cover page of this prospectus.

	Shares Purchased		Total Consideration		Average Price Per Share
	Number	%	Amount	%	
Existing stockholders	3,583,654	68.5	$ 9,224,449	36	$ 2.57
New investors	1,650,000	31.5	16,400,000	64	9.94
Total	5,233,654	100.0	$ 25,624,449	100.0	$ 4.90

The number of shares purchased from us by existing stockholders is based on 3,583,654 shares of our common stock outstanding as of March 31, 2013 after giving effect to the automatic conversion of all of our outstanding shares of Series A Preferred Stock, Series 1 Preferred Stock and Series B Preferred Stock into common stock upon the completion of this offering and the issuance of an additional 32,879 shares of common stock to the investors of our Series B-1 Preferred Stock, having a value of $361,668 assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus, and which will occur automatically upon completion. This number excludes:

- 662,543 shares of our common stock issuable upon the exercise of stock options as of May 21, 2013, with a weighted average exercise price of $1.60 per share
- 53,159 additional shares of our common stock issuable upon the exercise of outstanding warrants as of May 21, 2013, at a weighted average exercise price of $2.16 per share;
- 84,314 additional shares of our common stock reserved for future issuance under our equity incentive plans as of May 21, 2013; and
- 82,500 shares of our common stock issuable upon exercise of the warrants granted to Aegis Capital Corp. upon completion of this offering.

If the underwriters exercise their option to purchase additional shares from us in full, the number of shares held by new investors will increase to 1,897,500, or 35% of the total number of shares of common stock outstanding after this offering and the shares held by existing stockholders will be 3,583,654 but the percentage of shares held by existing stockholders will decrease to 65% of the total shares outstanding.

To the extent that the underwriters' over-allotment option is exercised or any warrants or options are exercised, there will be further dilution to new investors.

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

The following discussion and analysis should be read in conjunction with our audited annual consolidated financial statements and the related notes that appear elsewhere in this 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.

Overview

We are a development stage biopharmaceutical company engaged in the development of novel allogeneic, "off-the-shelf" cellular therapeutic vaccines to combat a wide range of cancers and infectious diseases. Our proprietary *ImPACT*™ cancer therapy is being designed to deliver live, genetically-modified, irradiated human cells which are "reprogrammed" to "pump out" a broad spectrum of cancer-associated antigens together with a potent immune adjuvant called "gp96" to educate and activate a cancer patient's immune system to recognize and kill cancerous cells. The secreted antigen-adjuvant complexes are designed to generate an anti-cancer immune response in patients by mobilizing and activating killer T cells that target multiple cancer antigens, thus harnessing a patient's own immune system to fight cancer. Based on results from a Phase 1 clinical trial in non-small cell lung cancer patients (NSCLC) conducted by the primary inventor of the technology that we license, in which 18 patients were vaccinated and 15 patients completed the first of three planned courses of therapy and were evaluated, we believe there is clinical evidence that the "off-the-shelf" therapeutic vaccine candidate HS-110 is capable of generating anti-cancer immune responses. Specifically, the trial observed a response in 11 of 15 patients. These findings were consistent with those of multiple pre-clinical published studies. HS-110 showed no overt toxicity.

As an "off-the-shelf" therapeutic vaccine, *ImPACT* uses a common master cell line to mass-produce a single vaccine product applicable to all patients for each particular cancer type, and thus, we believe, providing a traditional biopharmaceutical approach to deliver pan-antigen immunotherapy with logistical, manufacturing and cost of goods benefits compared to autologous patient-specific approaches.

We have submitted an IND to initiate a Phase 2 clinical trial in non-small cell lung cancer (NSCLC) with our therapeutic vaccine candidate HS-110, which is derived from a genetically-modified human lung cancer cell line.

We are also developing *ImPACT* therapeutic vaccines for bladder cancer, breast cancer and ovarian cancer. We plan to initiate a Phase 1/2 clinical trial for bladder cancer in mid 2013 with HS-410, a genetically-modified bladder cancer cell line. To date, in excess of $14,000,000 of funding has been awarded to the primary inventor of the technology that we license by the National Institutes of Health (NIH) and through other research and clinical grant in order to fund development of the technology that we license. We have little control over the direction of the NIH grant funds that have been received by the primary inventor of the technology we license and since payment is made to the inventor as opposed to us we do not recognize any revenue from such grant funds nor do they fund any expenses that we incur. Although earmarked for further development of the technology that we license, any funds awarded to the primary inventor are used in his discretion and we have little control over his use of the funds. Our strategy is to continue to apply for grants that will enable us to leverage our core technology platform. Our primary inventor also applies for academic grants to enhance the core technology platform. Grant funds received by our primary inventor are not utilized by us. Rather, these funds support our primary inventor's academic interests and may benefit us to the extent that these grants enable him to enhance the technology platform or generate additional data to support our programs. Currently, our primary inventor's academic grants are supporting the HS-110 NSCLC combination study as well as the HIV study. Our Phase 2 NSCLC study and our Phase 1/2 bladder cancer study are supported by us.

The actual amount of funds we will need to complete our 93-patient, Phase 1/2 trial of HS-410 is estimated to be $3.5 million of which $1,000,000 will be derived from the net proceeds of this offering and is subject to many factors, some of which are beyond our control. These factors include, but are not limited to, the following:

- the progress and cost of our research and development activities;
- the number and scope of our research and development programs;

- the progress and cost of our preclinical and clinical development activities;
- 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; and
- the costs and timing of regulatory approvals.

Recent Developments

In March 2013, we sold an aggregate of 1,891,419 shares of our Series B-1 Preferred Stock for gross proceeds of $5,050,090 in our Series B Preferred Stock private placement offering. All shares of Series B Preferred Stock automatically convert into shares of our common stock upon the consummation of a Qualified Public Offering. In addition, upon consummation of a Qualified Public Offering, the investors will be issued an aggregate of 32,879 shares of common stock (assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth on the cover page of this prospectus), and our obligation to issue, and the investors' obligation to purchase, Series B-2 Preferred Stock and warrants upon fulfillment of the conditions specified in our Stock Purchase Agreement with the investors will be terminated.

Critical Accounting Policies

Revenue Recognition

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

Stock Based Compensation

We account 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 us 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 option-pricing model on the date of grant for stock options and 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, 2012 and 2011 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. We have not paid dividends and do 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 over the period over which services are received.

The fair value of the common stock underlying our stock options was determined at each grant date by our board of directors and supported by periodic independent third-party valuations. Our board of directors intended all options to be exercisable at a price per share not less than the per share fair value price of our common stock underlying those options on the date of grant. The valuations of our common stock were determined in accordance with the guidelines outlined in the American Institute of Certified Public Accountants Aid, *Valuation of Privately-Held Company Equity Securities Issued as Compensation.* For grants of stock awards made on dates for which there was no valuation performed by a valuation specialist, our board of directors determined the fair value of our common

stock on the date of grant based upon the immediately preceding valuation and other pertinent information (such as significant changes in our activities) available at the time of grant.

We have granted stock options during the period from January 1, 2011 through May 21, 2013 as summarized below:

Option Grant Dates:	Number of Options Granted	Exercise Price Per Share	Common Stock Fair Value Per Share At Grant Date	Fair Value Per Option
April 7, 2011	12,610	$0.64	$0.64	$0.3857
April 7, 2011	108,696	$0.71	$0.64	$0.3172
April 12, 2011	141,852	$0.64	$0.64	$0.3926
October 25, 2011	20,871	$0.64	$0.64	$0.4338
October 25, 2011	6,522	$0.64	$0.64	$0.4683
October 25, 2011	21,740	$0.64	$0.64	$0.3857
November 22, 2011	21,740	$0.64	$0.64	$0.4071
April 25, 2012	98,087	$0.76	$0.76	$0.4356
April 25, 2012	2,174	$0.76	$0.76	$0.4526
May 30, 2012	1,305	$0.76	$0.76	$0.4526
November 8, 2012	77,176	$0.76	$2.23	$1.4009
April 29, 2013	34,132	$8.81	$8.81	$2.7851
May 15, 2013	38,364	$8.81	$8.81	$2.8243

Four valuations were performed by independent valuation specialists on March 31, 2011, March 31, 2012, December 31, 2012 and March 31, 2013.

To determine the fair value of the common stock, we considered three enterprise value allocation methods consistent with the American Institute of Certified Public Accountants Practice Aid, “Valuation of Privately-Held Company Equity Securities Issued as Compensation.” These methods are: (i) current-value method; (ii) the option pricing method; and (iii) the probability-weighted expected return method. Under the option pricing method, the common stock has value only if the funds available for distribution to stockholders exceed the value of the liquidation preference at the time of a liquidity event. The option-pricing method uses the Black-Scholes option model to price the call options. After considering several factors and circumstances, we utilized the option pricing backsolve method. The option pricing backsolve method treats common stock and Preferred Stock as call options on the enterprise/equity value, with exercise prices based on the liquidation preference of the Preferred Stock.

In order to estimate the fair value of the equity as of March 31, 2011, we did an option pricing backsolve method based on the recently issued convertible note. In May 2010 and September 2010, we completed the issuance of convertible promissory notes with an unrelated party which was considered to be at “arms-length.” We estimated the implied equity value to be approximately $3.4 million as of March 31, 2011. After consideration of specific facts and circumstances, the board of directors and management assumed a 3.5 years to a liquidity event. The anticipated timing and probability of a liquidity event was based on then-current plans and estimates of our board of directors and management regarding a liquidity event. Furthermore, volatility was estimated based on 3.5-year historical volatility of peer companies. To derive the value of the common stock, the proceeds to the common stockholders were calculated based on the preferences and priorities of the preferred and common stock, including the participation features of certain series of the preferred shares. A discount in the amount of 40% for lack of marketability was applied to reflect the risk arising from the inability to readily sell the shares. The discount for lack of marketability was based on our size, pre-profit stage, attraction to outside investors, and expectation of liquidity. After applying the 40% discount for lack marketability, we concluded the fair value of our common stock on a minority, non-marketable basis to be $0.64 per share.

To determine the fair value of our common stock as of March 31, 2012, we considered two scenarios based on the specific facts and our circumstances as of March 31, 2012. As of March 31, 2012, we had specific needs of cash in order to continue operations. As such, we were planning a series B round of financing. Based on the specific facts and circumstances, the first scenario assumes we will raise the Series B round of financing (“Going Concern”) and the second scenario assumes the Company will liquidate in the next three months (“Liquidation Scenario”).

Under the first scenario, the fair value of the common stock was determined by applying the option pricing backsolve method. A 5-year to liquidity was assumed by management and the board of directors based on the anticipated timing and probability of a liquidity event. Volatility was assumed based on historical volatility of peer companies. In order to estimate the implied equity value, we assumed terms and conditions based on the Series B round of financing. An option pricing backsolve method was applied to determine the value of the equity based on the anticipated Series B round of financing, which was expected to occur during the latter half of 2012 with an unrelated investor. Under the second scenario, the fair value of the common stock was determined by applying the current method given the immediate liquidity event. Our management and our board of directors (the "Board") assumed that we will liquidate in the next three months. Given the facts and circumstances, we assumed that there would be no proceeds available for distribution to the common stockholders, indicating the fair value of the common stock to be zero. After considering both scenarios, a weighted average of the current value approach and the OPM was calculated to estimate the fair value of the common stock as of March 31, 2012. A discount in the amount of 40% for lack of marketability was applied to reflect the risk arising from the inability to readily sell the shares. The discount for lack of marketability was based on our size, pre-profit stage, attraction to outside investors, and expectation of liquidity. After applying the 40% discount for lack marketability present in the common stock, we concluded the fair value of our common stock on a minority, non-marketable basis to be $0.76 per share.

To determine the fair value of the common stock as of December 31, 2012, the Company utilized the probability-weighted return method ("PWERM") to allocate the total equity value to the various securities, including Preferred Stock warrants. The PWERM model reflected our continued development, including the anticipation of the closing of Series B-1 convertible Preferred Stock financing. In addition, the model took into account the additional funding we received from our loan agreement that was entered into with Square 1 Bank in August 2012, the progression of our HS-110 program for non-small cell lung cancer and our HS-410 program for bladder cancer and notification that we were being considered as a candidate for potential grant funding for our non-small cell lung cancer program since the previous valuation dated March 31, 2012. The PWERM is a scenario-based analysis that estimates the value per share based on the probability-weighted present value of expected future investment returns, considering each of four future scenarios: an immediate IPO, a delayed IPO, a sale or merger, or liquidation. The equity is allocated pro rata among the total common shares on as-converted basis. The value per share under each scenario was then probability weighted and the resulting weighted values were summed to determine the fair value per share for each class. Our calculated discounts for the lack of marketability through the use of the Black-Scholes-Option Pricing Model, and applied an implied discount for marketability of 20.5% for the immediate IPO scenario, 29% for the delayed IPO scenario, and 61.7% for the sale or merger scenario. The expected outcomes were weighted based on a probability of forty percent (40%) for the liquidation scenario, with a lower probability for an IPO scenario of twenty-five percent (25%) and a probability of thirty-five percent (35%) for the sale or merger scenario. The fair values of the equity determined using the IPO and non-IPO scenarios were weighted according to our estimate of the probability of each scenario. Based on the PWERM model, the Board of Directors determined the fair value of our common stock at November 8, 2012 to be $2.23.

To determine the fair value of the common stock as of March 31, 2013, the Company again utilized the probability-weighted return method ("PWERM") to allocate the total equity value to the various securities, including Preferred Stock warrants. The PWERM model reflected our continued development, including the anticipation of the closing of Series B-1 convertible Preferred Stock financing. The PWERM is a scenario-based analysis that estimates the value per share based on the probability-weighted present value of expected future investment returns, considering each of three future scenarios: an IPO, a sale or merger, or liquidation. The equity is allocated pro rata among the total common shares on as-converted basis. The value per share under each scenario was then probability weighted and the resulting weighted values were summed to determine the fair value per share for each class. Our calculated discounts for the lack of marketability through the use of the Black-Scholes-Option Pricing Model, and applied an implied discount for marketability of 15.4% for the IPO scenario, and 40% for the sale or merger scenario. The expected outcomes were weighted based on a probability of twenty percent (20%) for the liquidation scenario, with a higher probability for an IPO scenario of fifty percent 50.0% and a probability of thirty percent (30.0%) for the sale or merger scenario. The fair values of the equity determined using the IPO and non-IPO scenarios were weighted according to our estimate of the probability of each scenario. Based on the PWERM model, the Board of Directors determined the fair value of our common stock at March 31, 2013 to be $8.81.

On April 7, 2011, we granted stock options to purchase a total of 12,610 and 108,696 shares at an exercise price of $0.64 and $0.71, respectively. We determined that the fair value of the common stock on the date of grant was $0.64 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2011 that indicated a valuation price of $0.64 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2011 to April 7, 2011.

On April 12, 2011, we granted stock options to purchase a total of 141,852 shares at an exercise price of $0.64. We determined that the fair value of the common stock on the date of grant was $0.64 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2011 that indicated a valuation price of $0.64 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2011 to April 12, 2011.

On October 25, 2011, we granted stock options to purchase a total of 49,133 shares at an exercise price of $0.64. We determined that the fair value of the common stock on the date of grant was $0.64 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2011 that indicated a valuation price of $0.64 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2011 to October 25, 2011.

On November 22, 2011, we granted stock options to purchase a total of 21,740 shares at an exercise price of $0.64. We determined that the fair value of the common stock on the date of grant was $0.64 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2011 that indicated a valuation price of $0.64 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2011 to November 22, 2011.

On April 25, 2012, we granted stock options to purchase a total of 100,261 shares at an exercise price of $0.76. We determined that the fair value of the common stock on the date of grant was $0.76 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2012 that indicated a valuation price of $0.76 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2012 to April 25, 2012.

On May 30, 2012, we granted stock options to purchase a total of 1,305 shares at an exercise price of $0.76. We determined that the fair value of the common stock on the date of grant was $0.76 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2012 that indicated a valuation price of $0.76 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2012 to May 30, 2012.

On November 8, 2012, we granted stock options to purchase a total of 77,176 shares at an exercise price of $0.76. We determined that the fair value of the common stock on the date of grant was $2.23 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of December 31, 2012 that indicated a valuation price of $2.23 per share.
- that there were no material changes in factors impacting the common stock per share value from November 8, 2012 to December 31, 2012.

On April 29, 2013, we granted stock options to purchase a total of 34,132 shares at an exercise price of $ 8.81. We determined that the fair value of the common stock on the date of grant was $8.81 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2013 that indicated a valuation price of $8.81 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2013 to April 29, 2013.

On May 15, 2013, we granted stock options to purchase a total of 38,364 shares at an exercise price of $8.81. We determined that the fair value of the common stock on the date of grant was $8.81 per share. To assess the reasonableness of our fair value on this date, we considered:

- the independent valuation report of March 31, 2013 that indicated a valuation price of $8.81 per share; and
- that there were no material changes in factors impacting the common stock per share value from March 31, 2013 to May 15, 2013.

Aggregate Intrinsic Value of Equity Awards

Based upon an assumed public offering price of $11.00 per share, the midpoint of the range reflected on the cover page of this prospectus, the aggregate intrinsic value of outstanding vested and unvested stock options as of March 31, 2013 (unaudited) was $11.2 million and $3.3 million, respectively.

Preferred Stock Warrant Liability

We have accounted for our freestanding warrants to purchase our Series A Preferred Stock as liabilities at fair value on the accompanying consolidated balance sheets. Prior hereto the warrants could only be settled in shares of Series A Preferred Stock. The warrants have been subject to re-measurement at each balance sheet date, and the change in fair value, if any, is recognized as other income (expense). At the time of the offering the warrants will have the right to purchase common stock so we will not continue to adjust the liability for changes in fair value.

Significant assumptions used in the valuation of the warrants were as follows:

	March 31, 2013	December 31, 2012	December 31, 2011
	(Unaudited)		
Exercise price	$4.83	$4.83	$4.83
Risk-free interest rate	1.56% – 1.87%	1.78%	1.65% – 1.92%
Expected volatility	76.2 – 76.3%	75.6 – 76.3%	75.1 – 76.7%
Expected life (years)	10	10	10
Expected dividend yield	0%	0%	0%

Material Weaknesses in our Internal Control over Financial Reporting.

Our management is responsible for establishing and maintaining adequate internal control over our financial reporting, as defined in Rule 13a-15(f) under the Exchange Act.

We have historically operated as a private company and the number and qualifications of our finance and accounting staff have not been consistent with those of a public company. We have identified material weaknesses in our internal controls with respect to our financial statement closing process of our consolidated financial statements for the years ended December 31, 2012 and 2011. Our management discovered certain conditions that we deemed to be material weaknesses in our internal controls, as follows:

- A lack of accounting and finance resources as well as effective oversight by those in charge of governance resulted in insufficient controls over timely financial statement preparation and review as well as the preparation and review around accounting for certain complex transactions.
- The design of monitoring controls used to assess the design and operating effectiveness of our internal controls is inadequate. We also do not have an adequate internal process to report deficiencies in internal control to management on a timely basis.

We have begun to take actions that we believe will substantially remediate the material weaknesses identified. In response to the identification of our material weaknesses, we (i) have retained a part-time Chief Financial Officer to segregate the duties of Chief Executive Officer and Chief Financial Officer; (ii) are in the process of establishing a review process for key aspects of our financial reporting process, including the accounting for complex transactions; and (iii) will seek to establish better operating controls and involve our board of directors in our internal controls process, which will involve establishing formal procedures to communicate deficiencies in internal controls on a timely basis, and encourage our board of directors to more actively participate in guiding management as it relates to internal controls matters. However, we cannot assure you that our internal control over financial reporting, as modified, will enable us to identify or avoid material weaknesses in the future. Regardless, following the completion of this offering we will be required to expend time and resources to further improve our internal controls over financial reporting, including by expanding our finance and accounting staff.

Results of Operations

For the Three Months Ended March 31, 2013 and 2012

Revenues

We had no revenue for the three months ended March 31, 2013 and March 31, 2012. Historically our revenue has been entirely comprised of grant awards, of which we received none in the three months ended March 31, 2013 and March 31, 2012. We plan to continue our efforts to secure future grant funding to subsidize our ongoing research and developments costs.

Operating Expenses

Operating expenses are primarily comprised of research and development expenses and general and administrative expenses. For the three months ended March 31, 2013, research and development expenses represented approximately 57% of operating expenses, clinical trials and regulatory represented approximately 8% of operating expenses, and general and administrative expenses represented approximately 35% of operating expenses. For the three months ended March 31, 2012, research and development expenses represented approximately 38% of operating expenses, clinical trials and research represented approximately 11% of operating expenses, and general and administrative expenses represented approximately 51% of operating expenses. For the three months ended March 31, 2013, total operating expenses increased 74% to $770,482 from $443,629 for the three months ended March 31, 2012. Research and development expenses increased approximately 158% to $440,289 for the three months ended March 31, 2013 from $171,865 for the three months ended March 31, 2012. For the three months ended March 31, 2013, approximately $199,500 of the increase in research and development expenses were attributable to manufacturing costs related to our Phase 2 lung cancer trial for a total expense for the project of approximately $268,000 for the period as compared to approximately $24,315 incurred for the first quarter of 2012. Approximately $18,250 was attributable to three new research projects with a university to further study the use of

our *ImPACT* therapy for new oncology and infectious disease indications. The balance of the variance in such expenses were not attributable solely to any one project but were attributable to research relevant to all of our projects. Clinical trials and regulatory expenses increased approximately 33% to $62,057 for the three months ended March 31, 2013, from $46,807 for the three months ended March 31, 2012, due to the engagement of an outside consultant to assist in the monitoring of our clinical trials. General and administrative expenses increased approximately 19% to $268,136 for the three months ended March 31, 2013, from $226,057 for the three months ended March 31, 2012. Approximately $27,600 was attributable to the retention of a Director of Finance as well as an increase in risk management costs of $6,720. Additionally, a new loan was negotiated for short term financing requirements that increased our banking fees by approximately $7,975.

Non-Operating Expenses

Non-Operating Expenses are primarily comprised of interest expense. The interest expense for periods ended March 31. 2013 and March 31, 2012 was $28,342 and $1,759 respectively, an increase of $26,583. This increase was due to interest on proceeds drawn against a note payable not executed until August of 2012.

Net Loss

Our net loss after deducting the non-controlling interest increased 73% to $763,856 for the three months ended March 31, 2013 from $441,684 for the three months ended March 31, 2012 for the reasons cited above.

For Years Ended December 31, 2012 and 2011

Revenues

Total revenue for the twelve months ended December 31, 2012, decreased approximately 98% to $3,110 as compared to $187,787 for the twelve months ended December 31, 2011. For both periods our revenue was entirely comprised of grant awards. In October 2010, we were awarded a grant from the Internal Revenue Service of $244,479 for the reimbursement of qualified investments in a therapeutic discovery project under section 48 of the Internal Revenue Service Code. The grant proceeds were paid in two installments of which $162,435 was paid in 2011 and was included in revenue for the twelve months ended December 31, 2011. We plan to continue our efforts to secure future grant funding to subsidize our ongoing research and developments costs.

Operating Expenses

Operating expenses are primarily comprised of research and development expenses and general and administrative expenses. For the twelve months ended December 31, 2012, research and development expenses represented approximately 38% of operating expenses, clinical trials and regulatory represented approximately 11% of operating expenses, and general and administrative expenses represented approximately 51% of operating expenses. For the twelve months ended December 31, 2011, research and development expenses represented approximately 56% of operating expenses, clinical trials and research represented approximately 11% of operating expenses, and general and administrative expenses represented approximately 33% of operating expenses. For the twelve months ended December 31, 2012, total operating expenses increased 5.5% to $2,345,787 from $2,222,587 for the twelve months ended December 31, 2011. Research and development expenses decreased approximately 28% to $902,938 for the twelve months ended December 31, 2012 from $1,246,587 for the twelve months ended December 31, 2011. This decline was due to expenses of approximately $162,000 for a large research project and approximately $146,000 for past patent expenses to the University of Miami which were incurred during 2011. For the twelve months ended December 31, 2012, approximately $357,744 and $108,147 of the research and development expenses were attributable solely to research related to our lung cancer and bladder cancer projects, respectively, and the balance of such expenses were not attributable solely to any one project but were attributable to research relevant to all of our projects. Comparatively, for the twelve months ended December 31, 2011 there were no such research expenditures that benefited any one project specifically. Also, research and development manufacturing costs decreased by approximately $101,000 as manufacturing was being phased into the clinical and regulatory phase. Clinical trials and regulatory expenses decreased approximately .08% to $253,189 for the twelve months ended December 31, 2012, from $255,210 for the twelve months ended December 31, 2011, which is consistent between the two periods. General and administrative expenses increased approximately 65% to $1,189,660 for the twelve months ended December 31, 2012, from $720,790 for the twelve months ended December 31, 2011, primarily as a result of our decision to retain a full-time CEO in the second quarter of 2011 which resulted in additional expense of

$200,450. Additionally, we incurred additional expenses of $72,723 for a contracted and full-time accounting staff. Finally, during the twelve months ended December 31, 2012 we incurred additional insurance expenses of $13,348 associated with enhanced risk management such as Directors and Officers Insurance and additional liability coverage, additional rent expense and administrative expenses of $31,641 due primarily to the execution of a new lease, additional stock compensation expense of approximately $138,350, additional financing costs of approximately $38,000, and additional audit fees of approximately $24,000. The additional unspecified increase in the general and administrative expense was attributable to our expansion.

Non-Operating Expenses

Non-Operating Expenses was primarily comprised of interest expense from our convertible notes and the 2012 write off of the debt discount associated with debt paid off during the period which increased to $101,086 for the year ended December 31, 2012 from $63,173 for the year ended December 31, 2011.

Net Loss

Our net loss after deducting the non-controlling interest increased 15% to $2,420,200 for the year ended December 31, 2012 from $2,104,884 for the year ended December 31, 2011. Although research and development costs declined by 28% due to decreased patent expenditures, the maturation of the company required additional staffing. A Vice President of Clinical and Regulatory was hired to manage our clinical trials as well as a full time Director of Finance. Additionally, the salary of the CEO was increased as stipulated in his employment agreement.

Liquidity and Capital Resources

We have financed our operations since inception primarily through proceeds from equity financings and debt financings, primarily involving private sales of our common stock and other debt and equity securities, and to a lesser extent from the proceeds from grant awards and commitments from banks and vendors.

In March 2013, we closed the first tranche of our Series B Preferred Stock private placement offering in which we sold an aggregate of 1,891,419 shares of our Series B-1 Preferred Stock for gross proceeds of $5,050,090.

Our cash and cash equivalents totaled $4,889,723 as of March 31, 2013, an increase of $4,837,795 from March 31, 2012. The primary source of cash during the quarter ended March 31, 2013 was the issuance in March of 1,891,419 shares of our Series B-1 Preferred Stock for gross proceeds of $5,050,090. Our cash and cash equivalents totaled $5,030 as of December 31, 2012, a decrease of $93,616 from December 31, 2011. During the year ended December 31, 2012, the primary sources of cash were issuances of stock and the draw downs on Square 1's promissory notes. In 2012, $725,000 was drawn on the Square 1 promissory notes and the outstanding principal balance at December 31, 2012 was $725,000. As of May 1, 2013, the Company has outstanding $725,000 on the promissory notes, with $2,275,000 available for future use. The Tranche A Loan principal balance is $500,000, the interest rate is currently at 6%, and the maturity date is August 7, 2016. The Term Loan B principal balance is $225,000, the interest rate is 4.25%, and the maturity date is December 14, 2014. The primary use of cash during the year ended December 31, 2011 was for working capital requirements.

Since inception we have raised $2,623,709 from the issuance of convertible notes to investors, of which notes in the principal amount of $2,273,709 were issued to one investor, Brightline Ventures III, LLC, the managing member of which is Mr. Smith, a member of our Board. As of December 31, 2010, we had notes outstanding to three investors in the aggregate principal amount of $1,176,000. The notes accrued interest at a rate of 3% per annum and were scheduled to mature 18 months after issuance. In 2011, we raised an additional $1,447,709 from the issuance of notes to three investors, one of which was Brightline Ventures III, LLC. The notes accrued interest at a rate of 3% per annum and were scheduled to mature 18 months after issuance. All of the notes were converted into shares of Series A Preferred Stock in September 2011.

Our continued operations will primarily depend on our ability to raise additional capital from various sources, including equity and debt financings, as well as grants and bank financings. On October 20, 2011, we entered into an agreement with a vendor that allowed us to make up to $950,000 of payments for invoiced services rendered by such vendor through the issuance of a convertible note. In May 2013, the note with the vendor was extinguished and the vendor extended the due date of all payables owed, including amounts previously due under the Note, until the earlier of July 15, 2013 or this offering or any other financing in which we receive gross proceeds of $2,500,000. If the closing of such financing does not occur prior to July 15, 2013 then one half of the payables owed as of July 15, 2013 shall be due July 15 2013 and the balance shall remain payable until such a financing is consummated. On December 14, 2011, we entered into a promissory note with the North Carolina Biotechnology Center pursuant to which we could borrow up to $250,000. The note accrued interest at a rate of 4.25% per annum. The principal was payable in annual installments in the amount of five percent (5%) of the outstanding principal as of the date of such payment, commencing on the anniversary date of the related loan agreement and continuing annually on the same day of each calendar period thereafter until December 13, 2014. In August 2012, we repaid all amounts outstanding under the note from the proceeds of the Square 1 Bank loan described below. In connection with the loan from North Carolina Biotechnology Center, we issued the North Carolina Biotechnology Center a warrant exercisable for 12,940 shares of our common stock at an exercise price of $4.83 per share, which warrant expires on December 13, 2021. In August 2012, we entered into a secured loan with Square 1 Bank, the proceeds of which were used in part to pay off the loan from North Carolina Biotechnology Center. The loan and security agreement that we entered with Square 1 Bank in connection with the secured loan (the "Square 1 Agreement") provides that Square 1 Bank will provide us with a term loan in the aggregate principal amount not to exceed $1,000,000 to be used for working capital and capital expenditures (the "Tranche A Loan"). The Tranche A Loan will be available to us until August 7, 2013. The Tranche A Loan is payable on August 7, 2013 in 36 monthly installments of principal and accrued interest. The Tranche A Loan matures on August 7, 2016. If we receive a grant that provides aggregate funds with a value of $16,000,000, the maximum aggregate of the Tranche A Loan and the Tranche B Loan amount increases to $2,775,000. Both the Tranche A Loan and the Tranche B Loan accrue interest monthly at an interest rate of 3% plus prime or 6% per annum whichever is greater. The Square 1 Agreement, as amended, also provides that if we receive at least $4,500,000 from the sale of our equity to investors after February 15, 2013 but on or before March 31, 2013 (such date we receive such funds being referred to as the "Trigger Date"), we can borrow an additional term loan in the aggregate principal amount not to exceed $1,000,000 to be used for working capital and capital expenditures (the "Tranche B Loan"). Due to the closing of the Series B-1 Preferred Stock private placement in March 2013, we will be able to borrow an additional $1,000,000 under such loan. The Tranche B Loan is payable as interest-only prior to the twelve month anniversary of the Trigger Date month after until August 7, 2013 and thereafter is payable in equal monthly installments of principal plus accrued interest until August 7, 2016. The Tranche B Loan matures on August 7, 2016. Square 1 Bank also made one term loan in the amount of $225,000, which was used to repay our debt to North Carolina Biotechnology Center (the "Term B Loan"). The Term B Loan matures December 14, 2014 and requires payments on the one and two year anniversary of the date of issuance equal to five percent of the principal amount of the loan plus accrued interest, with the balance of the loan being paid on maturity. The Term B Loan accrues interest monthly at an interest rate of 4.25% per annum. Once repaid the loans may not be re-borrowed. The loans are secured by a lien on substantially all of our assets, including our stock in our subsidiaries but excluding our intellectual property. Finally, Square 1 Bank also made one Non-Formula Advance (the "Non-Formula Advance") in the aggregate principal amount of $200,000 which is payable as interest-only on the 5th calendar day of each month through January 9, 2014 when the entire principal amount is due. As of May 1, 2013, we had outstanding $725,000 under the Square 1 Bank loans. In connection with the loan, we issued Square 1 Bank a warrant, as amended, exercisable for 17,500 shares of our common stock which after adjustment for our 1-for-2.3 stock split will be convertible into 7,609 shares of common stock. The warrant is exercisable for ten years at a price of $4.83, which price is subject to adjustment for certain transactions including certain dilutive transactions. The warrant holder is entitled to piggyback registration rights with respect to the underlying shares.

The loan and security agreement with Square 1 Bank sets forth various affirmative and negative covenants that the Company must comply with, including covenants regarding financial reporting, and "cash maintenance" burn" requirements, incurrence of indebtedness and mergers and acquisitions. We plan to use approximately $300,000 of the proceeds of this offering to repay the portion of the loans from Square 1 Bank due over the 12 months beginning September 2013. We currently have: (i) $500,000 outstanding under the Tranche A Loan and under the terms of the loan we are required to pay the principal balance plus accrued interest in 36 monthly installments beginning September 7, 2013 and ending August 7, 2016 and (ii) $225,000 outstanding under the Term Loan B, and under the terms of the loan we are required to make payments of 5% of the outstanding principal balance plus accrued interest each on August 2013 and 2014, with the remaining principal balance, plus all accrued interest, due December 14, 2014. In 2012 we borrowed $200,000 under the Non-Formula Advance from Square 1 Bank which was repaid in full in 2013 and $200,000 cannot be reborrowed.

In April 2010, we were awarded a grant award from the National Institute of Health in the amount of $300,000, of which $248,648 was paid to us in 2011. In October 2010, we were awarded a grant from the Internal Revenue Service of $244,479, of which $162,435 was paid in 2011.

Current and Future Financing Needs

We have incurred an accumulated deficit of approximately $6,699,138 as of March 31, 2013. 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.

The actual amount of funds we will need to complete our 125 patient Phase 2 trial on patients with advanced non-small cell lung cancer and a 93 patient, Phase 1/2 trial of HS-410, in bladder cancer which is estimated to be $9,350,000, is subject to many factors, some of which are beyond our control. These factors include, but are not limited to, the following:

- the progress and cost of our research and development activities;
- the number and scope of our research and development programs;
- the progress and cost of our preclinical and clinical development activities;
- 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; and
- the costs and timing of regulatory approvals.

We have based our estimate on assumptions that may prove to be wrong. We continue to require additional funds to fully implement our planned research and development and may need to obtain these funds sooner or in greater amounts than we currently anticipate. Potential sources of financing include corporate partnerships or public or private sales of our shares 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 other than as described previously and there can be no assurance given that any 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, as a result, our business, financial condition and results of operations would be materially harmed.

License and Contractual Obligations

Below is a table of our contractual obligations for the years 2013 through 2017 and thereafter through December 31, 2022 *(in thousands)*:

	Year ended December 31,						
	2013	2014	2015	2016	2017	Thereafter	Total
Total License Agreements(1)	$ 30	$ 30	$ 30	$ 30	$ 280	$ 150	$ 550
Lease Agreements(2)	28	—	—	—	—	—	28
Total	$ 58	$ 30	$ 30	$ 30	$ 280	$ 150	$ 578

(1) Represents minimum royalty payment commitments under our license agreements that are required to be paid with the passage of time.

(2) In November 2011, we entered into a thirteen month lease agreement for office space commencing February 1, 2012 for a monthly rent of $3,870. The lease term may be extended for an additional 24 months on substantially the same terms. On December 19, 2012, we entered into a lease modification agreement which extended the lease term until July 31, 2013 and the monthly rent increased to $4,046. Future minimum lease payments are as set forth above.

Below is a table of our contractual payments under the Company's notes payable and convertible notes payable agreements for the years 2013 through 2016 as of May 21, 2013 *(in thousands)*:

	Year ended December 31,				
	2013	2014	2015	2016	Total
Notes Payable	$ 104	$ 403	$ 178	$ 113	$ 798
Convertible Notes Payable*	694	—	—	—	694
Total	$ 798	$ 403	$ 178	$ 113	$ 1,492

* In May 2013, the convertible note payable was extinguished and the vendor extended the due date of all payables owed, including amounts previously due under the note, until the earlier of July 15, 2013 or this offering or any other financing in which we receive gross proceeds of $2,500,000. If the closing of such financing does not occur prior to July 15, 2013 then one half of the payables owed as of July 15, 2013 shall be due July 15 2013 and the balance shall remain payable until such a financing is consummated.

BUSINESS

Overview

We are a development stage biopharmaceutical company engaged in the development of novel allogeneic, "off-the-shelf" cellular therapeutic vaccines to combat a wide range of cancers and infectious diseases. Our proprietary *ImPACT*™ Immune Pan Antigen Cytotoxic Therapy is being designed to deliver live, genetically-modified, irradiated human cells which are reprogrammed to "pump out" a broad spectrum of cancer-associated antigens together with a potent immune adjuvant called "gp96" to educate and activate a cancer patient's immune system to recognize and kill cancerous cells. We intend for our *ImPACT* cells to secrete an antigen-adjuvant complex that generates anti-cancer immune responses in patients by mobilizing and activating cytotoxic "killer" T cells that target multiple cancer antigens, thus harnessing a patient's own immune system to fight cancer.

Unlike autologous or "personalized" therapeutic vaccine approaches which require extraction and processing of cancer or blood from each individual patient, our*ImPACT* therapeutic vaccine uses a master cell line containing a host of known and unknown tumor associated antigens to mass-produce a single vaccine product applicable to all patients with a particular cancer type. We believe our off-the-shelf, allogeneic immunotherapy offers logistical, manufacturing and cost of goods benefits compared to autologous patient-specific approaches.

Our most advanced product candidates are HS-110 and HS-410.

HS-110

We have submitted an IND to initiate a Phase 2 clinical trial in non-small cell lung cancer (NSCLC) patients with our therapeutic vaccine candidate HS-110, which is derived from a human lung cancer cell line. HS-110 is a biologic product which consists of 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 a gp96 adjuvant and is designed to activate a T-cell mediated pan-antigen immune response against the patient's cancer. The inventor of the *ImPACT* technology that we license recently 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. Eighteen 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.

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. HS-110 provides evidence of 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), 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 is surviving over four years since starting the therapy and another patient is surviving over three years since starting the therapy. These findings were consistent with multiple pre-clinical published studies on *ImPACT* therapy.

HS-410

We intend to submit an IND to initiate a Phase 1/2 bladder cancer trial with HS-410, which is derived from a human bladder cancer cell line. HS-410 is a biologic product which consists of a bladder cancer cell line which has been genetically modified using our *ImPACT* technology platform to secrete a wide range of bladder cancer antigens bound to a gp96 adjuvant and is designed to activate a T-cell mediated pan-antigen immune response against the patient's bladder cancer. Following FDA clearance, we intend to initiate a 93 patient, Phase 1/2 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 and 6 weekly intravesical bacillus Calmet-Guerin (BCG) immunotherapy installations. We anticipate including approximately 8-10 clinical sites with an enrollment period of 12-18 months. Patient enrollment is expected to begin in Q3-2013.

Additional Indications

We are also developing *ImPACT* therapeutic vaccines for breast cancer and ovarian cancer. The inventor of the *ImPACT* technology intends to initiate a second grant-funded, investigator-sponsored Phase 1/2 clinical trial of our *ImPACT* therapy in conjunction with other therapies against NSCLC in the second quarter of 2013. To date, in excess of $14,000,000 of funding has been awarded to the primary inventor of the technology we license by the National Institutes of Health (NIH) and through other research and clinical grants, which has been used to further develop our *ImPACT* technology platform that we license. We have little control over the direction of the NIH grant funds that have been received by the primary inventor of the technology we license and since payment is made to the inventors as opposed to us we do not recognize any revenue from such grant funds nor do they fund any expenses that we incur. Although earmarked for further development of the technology that we license, any funds awarded to the primary inventor are used in his discretion and we have little control over his use of the funds. The NIH is also currently fully funding the primary inventor's study of an HS-HIV product candidate in non-human primates with a therapeutic and prophylactic vaccine for the treatment and prevention of HIV utilizing the *ImPACT* approach.

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

Product Candidate	Indication	Phase of Development	Upcoming Milestone(s)
HS-110	Non-Small Cell Lung Cancer (NSCLC)	Open commercial IND	2013 - Initiate Phase 2
HS-410	Bladder Cancer Adjuvant	IND submission planned. Completing cGMP Drug Manufacturing	2013 - Initiate Phase 1/2
HS-310	Ovarian Cancer	Pre-clinical. Initiating cGMP Drug Manufacturing	2014 - Phase 1/2 trials
HS-510	Triple Negative Breast Cancer (TNBC)	Pre-clinical. Cell line development underway	2014 - Phase 1/2 trials

The table below summarizes the primary inventor's clinical development of the *ImPACT* technology:

Product Candidate	Indication	Phase of Development
HS-110	Non-Small Cell Lung Cancer (NSCLC)	Completed Phase 1 Interim Study Report
HS-110	Non-Small Cell Lung Cancer (NSCLC) Combination Therapy	Completed cGMP Drug Manufacturing. 2013 - Initiate Phase 1/2
HS-HIV	HIV	Pre-clinical. NIH-sponsored Primate Studies Completed

***ImPACT* Therapy—Novel Pan-Antigen Immune Activation**

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 which 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 pre-clinical 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 not only combat a wide range of cancers, but also against various infectious diseases, such as hepatitis C, malaria and HIV, for which non-human primate studies, which we believe are encouraging, have been completed. 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. We should have sufficient capital from the offering to operate the company for 24-30 months.

Our ImPACT Therapy Product Candidates

We plan to submit our Phase 2 clinical trial protocol for HS-110, our lead drug candidate, against non-small cell lung cancer (NSCLC) to FDA and initiate the trial in 2H-2013. Our Phase 2 trial will expand upon the Phase 1 results obtained by the primary inventor as described below.

We also plan to initiate a Phase 1/2 clinical trial against bladder cancer in mid-2013 using our HS-410 drug candidate. We plan to utilize this vaccine to delay or prevent the recurrence of bladder cancer in post-resected bladder cancer patients.

We are also anticipating initiating clinical trials using our*ImPACT*-based product candidates against a number of other diseases, including ovarian cancer and breast cancer.

Our Product Candidates and Clinical Development Programs

Our development program involves testing our*ImPACT*-based product candidates against a number of disease targets, including non-small cell lung cancer, breast cancer, ovarian cancer, bladder cancer and HIV. We are planning to enter a Phase 2 clinical trial with our first therapeutic vaccine, HS-110, for non-small cell lung cancer (NSCLC) in 2H-2013. We are also planning to initiate a Phase 1/2 clinical trial of HS-410 for bladder cancer in mid-2013. In addition, we may also initiate Phase 1 clinical trials for breast and/or ovarian cancer in 2014, dependent upon the receipt of additional non-dilutive grants and/or product financings. The primary inventor of the technology that we license is conducting a study in non-human primates with a therapeutic and prophylactic vaccine for the treatment and prevention of HIV. This ongoing study is fully funded by the NIH.

Strengths and Competitive Advantages

- We believe our *ImPACT* technology combines broad antigen targeting of known and unknown tumor associated antigens complexed with a potent immune adjuvant. We believe *ImPACT* has been shown to activate the immune system against a wide variety of antigens by eliciting a significant cytotoxic T cell immune response as measured by extensive pre-clinical and initial clinical immunological testing. The activated immune response generated by our *ImPACT* Therapy may be useful in treating a wide range of cancers and infectious diseases.
- We have submitted an IND and intend to initiate a Phase 2 clinical trial in NSCLC patients with our therapeutic vaccine candidate HS-110, which is derived from a genetically-modified human lung cancer cell line. We expect to initiate a Phase 1/2 clinical trial for bladder cancer with our second product candidate, HS-410, in 2H-2013.
- The National Institute of Health (NIH) and other organizations have provided funding to the primary inventor of the technology that we license for both his pre-clinical and clinical studies.
- Our proprietary *ImPACT* technology platform is being applied to develop multiple therapeutic vaccines against a wide range of cancers and infectious diseases. Generating positive results and gaining FDA approval for multiple therapies would lower our dependence on any one drug in order to generate returns.
- 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.
- We believe that we may be able to rapidly develop new allogeneic vaccines for different types of cancers and other diseases as our technology can readily be applied to many different forms of cancer.

- Our therapies do not require an additional adjuvant. 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.
- We believe our business model is capital efficient as we continue to leverage academic and institutional resources in order to develop new products and to begin to move these products into and through clinical trials.

Strategy

Our objective is to become a leading biopharmaceutical company specializing in the development and commercialization of allogeneic, off-the-shelf therapeutic vaccines. We are focused on discovering, developing and applying our core platform *ImPACT* technology towards a number of disease indications. The key elements of our strategy are:

- *Develop and obtain regulatory approval for our ImPACT-based products.* We plan to initiate a Phase 2 clinical trial in NSCLC in 2H-2013 and intend to conduct a Phase 1/2 clinical trial in bladder cancer in mid-2013. Additionally, we plan to initiate clinical trials against breast and ovarian cancer in 2014, pursuant to receiving additional non-dilutive grants and/or product financings. After NSCLC, bladder, breast and ovarian cancers, we plan to initiate additional clinical trials against other disease targets utilizing our *ImPACT* technology platform.
- *Maximize commercial opportunity for our ImPACT technology.* Our 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 corporate partnerships. We believe that we should be well positioned to successfully commercialize our product candidates independently or through U.S. and international corporate 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 five different patent families directed to therapeutic compositions and methods related to our vaccine platform and preclinical development programs for cancer. These families comprise five PCT applications, six issued patents, two allowed or accepted patent applications, and thirty-seven 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* technology platform and its 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 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* technology platform. We plan to continue to leverage this 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 1.66 million people in the U.S. will be diagnosed with cancer in 2013. The lifetime probability of being diagnosed with an invasive cancer is 45% for men and 38% for women. It is projected that 580,350 Americans will die from cancer in 2013.

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 2001 and 2007 is an average of 67%. According to the Center of Disease Control, in 2011, cancer was the second leading cause of mortality in the U.S. (23.2%) behind heart disease (24.1%). The American Cancer Society estimates that one in four deaths in the U.S. 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 compounds 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, 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, the success of HS-110, HS-310, HS-410 and HS-510 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 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 causea 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* technology is a form 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*-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 eventually become life threatening. Our therapeutic vaccines are designed to assist the immune system in identifying and eliminating malignant cells. Our approach involves the introduction of cellular antigens that are characteristic of malignant cells with the goal of generating an immune response against the particular form of cancer. In our approach, in addition to introducing a number of cancer-specific antigens, we also introduce a protein known as gp96 which stimulates and primes the immune system to further recognize cancer antigens and generates a potent and broad pan-antigen immune response against cancerous cells.

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.
- Most active immunotherapies employ defined antigens that are not effective against multiple types of cancer.
- Most immunotherapies produce toxic effects resulting in damage to healthy tissues if the target antigen is absorbed by normal cells in addition to the targeted cancer or virus-infected cells.
- 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.

These shortcomings were highlighted by the findings of a study recently published in*Nature Medicine* (Finak and Park (2008), Stromal gene expression predicts clinical outcome in breast cancer, Nature Medicine, 14, 518 – 527) where the whole genomes of 50 patients' breast cancer tumors were sequenced alongside matching DNA from the same patients' healthy cells to identify the genetic alterations present in the cancerous cells. The study found that the genomic pattern of each of the tumors varied significantly. Of the approximately 1,700 gene mutations found in total, most were specific and unique to the individual patients' cancerous tumors, and that only three of the genetic mutations occurred in 10% or more of the patients.

Although many of the immunotherapies currently in clinical development have shown promising results, we do not believe that any of them utilizes a technology that employs the patient's own cancer or virus-infected cells to create a fully personalized immunotherapy that is directly targeted to the patient's unique genetic disease.

Our Solution: ImPACT Therapy

We believe our *ImPACT* Therapy has 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:

- It is designed to fight cancer by activating the immune system against a wide variety of cancer antigens.
- It is 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.
- It is 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* product candidates to have potential benefits across multiple disease stages and tumor types and in combination with other therapies. We believe our *ImPACT* technology can be targeted to additional specific tumor types by modifying cells from the cancer type of interest.

- Our *ImPACT* Therapy represents a first-in-class adjuvant that functions as both an immune activator and an antigen-delivery vehicle. *ImPACT* is the only adjuvant technology platform currently known to us in clinical development that is specific to CD8+ cytotoxic T cell immune response, which is especially important for developing therapeutics in oncology as well as a number of other infectious disease indications.
- We believe many patients who are too ill to tolerate chemotherapy due to the associated toxicities may be able to benefit from our *ImPACT* product candidates.

ImPACT TECHNOLOGY PLATFORM

ImPACT Background

Our *ImPACT* technology represents an allogenic or "off-the-shelf" method to deliver cancer antigens accompanied by 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 a process called "necrosis", such as when it is infected and killed by a flu virus or other pathogen, the cell releases it 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. 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.

HSP's 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 irreparable proteins to intracellular garbage disposals to be degraded into peptides (short chains of amino acids – 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.

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, 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 release 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, MD, Ph.D., the Chairman of our Scientific Advisory Board and the inventor of our technology, deleted this KDEL sequence and replaced it with another sequence that causes the new fusion protein, called gp96-Ig, to be released 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 proteins. Dr. Podack demonstrated in the laboratory 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. **Thus, *in vitro* proof-of-principle was established that the innovation, gp96-Ig, not only retained the desired properties of the native gp96 protein, but enhanced those functions and led to tumor-killing 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 10 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. Additionally, the immune response killed tumor cells, releasing additional gp96 and creating a continuous response loop that supports persistent activation of killer T cells. 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 cell.

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

  A single type of tumor (or virus) 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 native tumor-cell line, we believe that *ImPACT's* technology can develop a therapy that shares many common features with patients' tumors of the same origin. 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 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, **Heat's patented approach uses modified heat shock proteins to stimulate an immune response against multiple antigens contained within cancer cells.** Cancer cells express different antigens that can be used to initiate an immune response. Each *ImPACT* vaccine is created from a native tumor-cell line that we believe expresses the widest array of antigens common to a particular type of cancer. We believe this "pan-antigen" approach provides each patient with a higher likelihood of a response to the therapy.

(ii) Heat's product candidates are made from "off-the-shelf" (allogeneic) cells and may therefore be **less expensive to manufacture than patient-specific (autologous) vaccines**. Heat's 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, **Heat's *ImPACT* technology is the only known "off-the-shelf" (allogeneic) vaccine to us 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 Product Candidates and Clinical Development Programs

We have initiated development programs to target our *ImPACT* technology platform against a range of diseases, including non-small cell lung cancer, bladder cancer, breast cancer and ovarian cancer. We have submitted an IND and intend to submit a protocol for and initiate a Phase 2 clinical trial with our first therapeutic vaccine, HS-110, against NSCLC in 2H-2013, and we are planning to initiate a Phase 1/2 clinical trial for bladder cancer in mid-2013. We plan to initiate Phase 1 trials for breast and ovarian cancer in 2014, pursuant to receiving additional non-dilutive grants and/or other financings. Our lead scientist has also completed a study in primates for the development of a therapeutic and prophylactic vaccine for the treatment and prevention of HIV. This study continues to be 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 in 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 any such research to further clinical trials and incorporate such research into our future development plans.

Summary of HS-110 Clinical Trials

Phase 1 HS-110 Clinical Trials

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 $\geq$ 18 years; ECOG performance status 0-2; life expectancy $\geq$ 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.

HS-110 provides evidence of 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 is surviving over four years since starting the therapy and another patient is surviving over three years since starting the therapy. These findings were consistent with multiple pre-clinical 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. 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)**
Inspection 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)
Cardiovacsular 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.

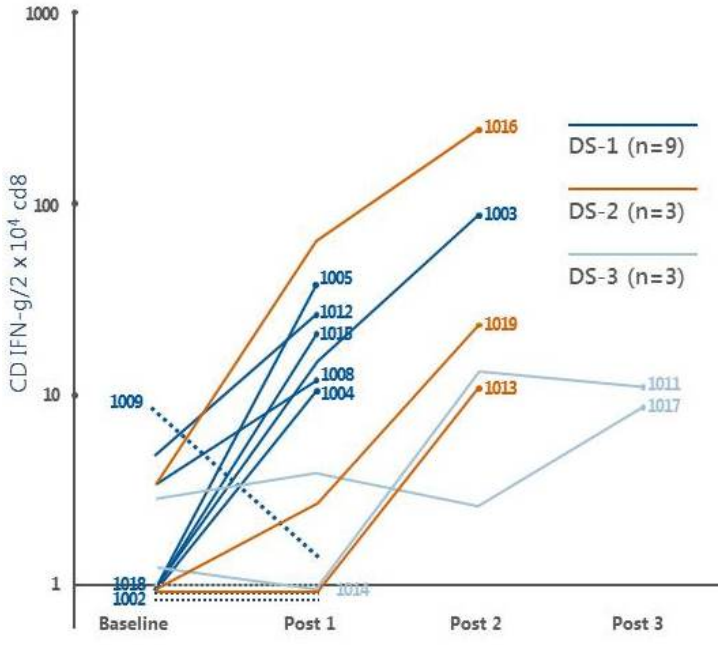
b The single grade 3 AE was in the body as a whole category (fatigue) and was rated as possibly related.

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.



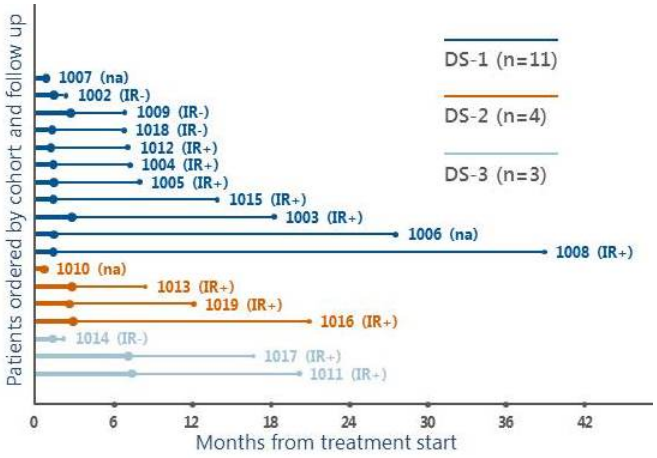
CD8 IFN- γ response. Samples from 15 patients collected for immune response at baseline and after at least one course of vaccination were available for analysis of the CD8 IFN- γ response. 20,000 purified patient CD8 T cells were stimulated with vaccine cells for 40h in ELI-spot plates and the frequency of IFN- γ secreting cells determined. + indicates first increase. Solid 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

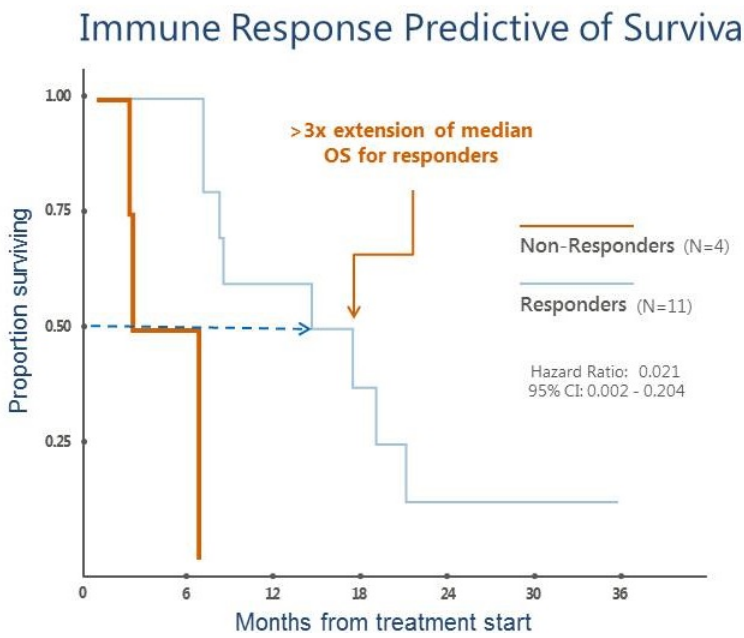
Seven of 15 patients completing the first course of therapy (39%; 95% CI: 17.3- 64.3%) achieved disease stabilization after the first course of vaccinations (6 weeks) and 8 patients had disease progression. While the protocol required that we look for such responses, as is typical in immunotherapy, no partial or complete tumor responses were noted in the study. Although clinicians and patients may perceive disease stabilization as beneficial, without a control arm 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 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. As of March 2013, 2 of the 15 patients who completed the first course of therapy remain alive and have been followed for over 3 years and 4 years, respectively. The Kaplan-Meier estimate of median 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.

ONCOLOGY INDICATIONS of *ImPACT*

Lung Cancer

Disease

Lung cancer is the leading cause of cancer-related death in the United States. According to the National Cancer Institute, in 2013, lung cancer is expected to account for 26% of all female cancer deaths and 28% of all male cancer deaths. An expected 228,190 people will be diagnosed with lung cancer in the United States in 2012. Of these lung cancers, roughly 85% will present as non-small cell lung cancer. Patients with advanced clinical stage IIIB/IV disease visible on chest radiography have a 5-year survival rate as low as 1-5%.

Clinical Development

The technology that we license was the subject of an investigator initiated Phase 1 clinical trial conducted at the Sylvester Cancer Center for the treatment of non-small cell lung cancer ("NSCLC" or "lung cancer") to establish safety and proof of concept clinical efficacy.

After completion of the 18 patient Phase 1 trial, in which 15 patients completed the first course of three planned course of therapy and were evaluated, we successfully opened a new IND to conduct additional trials with HS-110 in patients with NSCLC. Our Phase 2 study, which has not yet been reviewed by FDA, has been designed as a maintenance therapy study in patients with Stage III/IV NSCLC who have completed a 1st line regimen consisting of a platinum doublet, crizotinib or erlotinib and achieved at least stable disease. The trial is structured as a multicenter randomized, double-blind, placebo-controlled study to evaluate the immune response, safety and efficacy endpoints of HS-110 when administered weekly for 18 weeks in patients with non-small cell lung cancer (NSCLC).

We anticipate opening approximately 15-20 clinical sites and enrolling approximately 125 patients with an expected enrollment period of 2.5 years. The trial is a 3-stage design. In stage 1 (dose-finding), patients will be randomized to either placebo treatment, low dose HS-110 (2 x 10^6 cells) or high dose HS-110 (1 x 10^7 cells), administered weekly for 18 doses (18 weeks). In stage 2 (proof of concept), patients will be randomized to either placebo treatment or HS-110 at the dose determined to produce the optimal immune response in Stage 1. In Stage 3 (biocomparability), patients will be randomized to one of two preparations of HS-110 administered weekly for 18 weeks at the dose determined to produce the optimal immune response in Stage 1. The primary endpoint in Stages 1 and 3 will be immune response; the primary endpoint in Stage 2 will be progression-free survival. All stages will examine additional secondary endpoints including overall survival.

In addition to our Phase 2 study, our chief scientist has received a grant award from the Marcus Foundation that fully funds a 36 patient Phase 1/2 investigator-sponsored Phase 1/2 study for use of HS-110 as a combination therapy with theophylline and oxygen. We expect that he will begin this study in Q2-2013.

Bladder Cancer

Disease

In the United States, bladder cancer is the fourth most common type of cancer in men and the ninth most common cancer in women. According to the National Institutes of Cancer, 1 in 42 men and women will be diagnosed with bladder cancer during their lifetime, a total of more than half a million patients in the US. There are more than 60,000 cases of bladder cancer diagnosed each year in the United States, resulting in over 14,000 deaths per year. Available treatments are currently not effective, thus this remains an area of high unmet need.

Clinical Development

The Bladder Cancer Phase 1/2 Trial

cGMP-grade cell lines are currently being developed that will be used to treat patients with advanced bladder cancer. It is anticipated that these cellular vaccines will be completed by the 2nd quarter of 2013, with a Phase 1/2 clinical trial beginning mid-2013. In parallel with our clinical development plans, we have engaged a vendor as our clinical grade contract manufacturer for our future potential Phase 3 trial.

Preparation of IND documents in support of HS-410 for bladder cancer are in progress. We anticipate IND activation in 2013. This IND will include a 93 patient, Phase 1/2 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 and 6 weekly intravesical bacillus Calmet-Guerin (BCG) immunotherapy installations. We anticipate including approximately 8-10 clinical sites with an enrollment period of 12-18 months.

The Phase 1 portion will randomize 18 patients in 1:1 fashion to either a high or low dose group. Patients will receive weekly intradermal injections of HS-410 for 18 weeks and immune response will be evaluated at baseline, week 6, week 12 and week 18. The first 4 patients in each dose group will be enrolled at 2 week intervals to allow opportunity to assess safety and tolerability of HS-410. At the completion of the Phase 1 portion of the study, the dose resulting in the optimal immune response will be advanced to Phase 2. In the Phase 2 portion, 75 patients will be enrolled in 2:1 fashion to HS-410 or placebo. Primary endpoint will examine time to 1^{st} recurrence of bladder cancer. Other endpoints will include recurrence rate, progression rate and immune response. Depending on the results of this Phase 1/2 study and the prevalence of the disease, we may seek desigination of HS-410 as an orphan drug.

Triple Negative Breast Cancer

According to the American Cancer Society, there will be 234,580 new cases of breast cancer diagnosed in 2013. Approximately 10-20% of those cases will be triple negative breast cancer (TNBC), an aggressive form of the disease marked by earlier age of onset, worse clinical outcome, and a higher rate of local relapse. This disease cannot be treated by hormone therapy or receptor-directed monoclonal antibodies. New approaches for treatment to prevent relapse in this disease after early treatment need to be investigated.

Clinical Development

The TNBC Phase 1 Trial

We are currently developing cGMP grade cell lines that will be studied in the treatment of patients with TNBC. It is anticipated that these cell lines will be ready for use by the 2nd quarter of 2013, with a Phase 1 clinical trial in early 2014.

Ovarian Cancer

Disease

Ovarian cancer accounts for about 3% of all cancers among women and ranks the second among gynecologic cancers. According to the American Cancer Institute, an estimated 22,240 new cases are expected in the US in 2013. Ovarian cancer causes more deaths than any other cancer of the female reproductive system, and will lead to an estimated 14,030 deaths in the United States in 2013.[16] Due to the prevalence of ovarian cancer and its poor prognosis, particularly when discovered late, the development of novel therapeutics for the treatment of ovarian cancer is a high priority.

Clinical Development

We are currently developing cGMP-grade cellular vaccines that will be studied in the treatment of patients with advanced serious ovarian carcinoma. These cell lines were ready for use in early 2013, with a Phase 1 clinical trial pending the availability of adequate funding.

Other Cancers

Our *ImPACT*-technology is a broad based approach and can be used to combat a variety of cancers. We are in the process of identifying available cell lines, such as pancreatic cancer, melanoma, glioblastoma, and vesicular lymphoma. We expect to have several additional *ImPACT*-based products in the clinic in 2014.

Infectious Diseases

To date, over $4,000,000 in governmental and institutional funding has been provided to the inventor of the technology we license for HIV and hepatitis C virus (HCV) research using our *ImPACT*-technology. We do not intend to use any of the proceeds of this offering to further any HIV or HCV research and instead plan to conduct additional research with respect to the use of our *ImPACT*-technology for the treatment of such diseases solely through additional governmental and institutional grants, if any, that may be received.

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. The HS-110 used in the inventor's Phase 1, and planned for use in our Phase 2 clinical trial, was and is currently manufactured by our contractors under current good manufacturing practices, or cGMP.

We have retained a vendor, who has begun production of HS-110 to be used in Phase 2 and our potential Phase 3 clinical trials. We entered into an eight year Manufacturing Services Agreement, dated October 19, 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 certain minimum amounts each year 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 our clinical trials was and is currently manufactured under cGMP. The vaccine is grown in large quantities and quality tested according to FDA guidelines. Following testing, 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. Quality tested, irradiated batches of the vaccine are then dispensed into individual doses and frozen in liquid nitrogen. These batches of frozen vaccine are stable for long periods of time, and are thawed immediately prior to administration to patients. Sufficient material to complete the HS-110 Phase 2 study has already been produced, and preparations are underway to produce quantities required for subsequent clinical trials.

Competition

The pharmaceutical industry and biologics industry are each highly competitive and characterized by a number of established, large pharmaceutical companies and other 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 biotech company with a cancer immunotherapy as its lead therapeutic, 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 (Alimta), Bristol-Myers Squibb (Erbitux) and Sanofi-Aventis (Eloxatin), and more established biotechnology companies such as Roche/Genentech (Avastin and Tarceva), and competing cancer autologous immunotherapy companies such as Dendreon and others 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 kGaA/Oncothyreon's Stimuvax for the treatment of breast cancer and NSCLC; Transgene and its product TG4010 for the treatment of NSCLC lung cancer; GlaxoSmithKline and its product MAGE-A3 for the treatment of melanoma, NSCLC, multiple myeloma and squamous cell carcinoma; Oxford BioMedica and its product TroVax for the treatment of prostate, kidney and colorectal cancer); NewLink Genetics and its treatment for pancreatic cancer and lung cancer; Celldex/Pfizer and their product CDX-110 for the treatment of malignant brain cancer; and Dendreon and its product Provenge for the treatment of prostate cancer.

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: Alimta (pemetrexed), Avastin (bevacizumab), Tarceva (EGF inhibitor), Gemzar (gemcitabine), Erbitux (cetuximab), Carboplatin, Taxol, VP16 and Arlibercept. 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 against 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 entered Phase 3 clinical trials.

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. Over 95% of newly developed cancer immunotherapies cost over $20,000 per course of treatment.

Grant Funding

To date, in excess of $14,000,000 in grants, have been awarded to the primary inventor of the technology we license to fund development of *ImPACT* technology and clinical trials upon which our clinical programs are based. We have little control over the direction of the NIH grant funds that have been received by the primary inventor of the technology we license and since payment is made to the inventors as opposed to us we do not recognize any revenue from such grant funds nor do they fund any expenses that we incur. Although earmarked for further development of the technology that we license, any funds awarded to the primary inventor are used in his discretion and we have little control over his use of the funds. Our strategy is to continue to apply for grants that will enable us to leverage our core technology platform. We have applied for grant funding in the amount of approximately $17,000,000

from the NIH, DOD, CPRIT and other public and private foundations to be used to expand our lung cancer clinical trial and commence other research and development activities, however, there can no assurance that such grant funding will be awarded to us. Our primary inventor also applies for academic grants to enhance the core technology platform. Grant funds received by our primary inventor are not utilized by us. Rather, these funds support our primary inventor's academic interests and may benefit us to the extent that these grants enable him to enhance the technology platform or generate additional data to support our programs. Currently, our primary inventor's academic grants are supporting the HS-110 NSCLC combination study as well as the HIV study. All other clinical programs, including our Phase 2 NSCLC study and our Phase 1/2 bladder cancer study are supported by us.

Previous Grant awards for development of *ImPACT*

Grant Title	Granting Organization	Amount
Regulation of Anti-Tumor Immunity	NIH	$6,187,904
Molecular Mechanism of Anti-Tumor and Anti-Bacterial Cytotoxicity	NIH	$897,295
Mechanisms of mucosal protection by HPV-SIV and gp96-Ig-SIV vaccines	NIH	$2,000,000
Systemic and mucosal HIV-immunity by HSP-gp96 vaccines	NIH	$451,410
Induction of mucosal SIV immunity in non-human primates by secreted HSP-gp96	NIH	$2,124,733
Clinical Translation of Gene Therapy for Lung Cancer Award Recipient	Alliance for Cancer Gene Therapy	$1,000,000
Clinical Translation of Gene Therapy for Lung Cancer Award Recipient	State of Florida	$100,000
QTDP Grant	Dept. of Treasury	$244,479
Use of HS-110 as a Combination Therapy with Theophylline and Oxygen in Advanced Lung Cancer Patients	Marcus Foundation	$840,000

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 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 U.S. 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*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, of which 5% was non-dilutable until our receipt of the proceeds of our recent Series B-1 Preferred Stock private placement in March 2013. 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 percent (ranging from 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 has agreed to postpone the payment due dates of this license agreement. To date, a total of $360,113 has been paid to the University with respect to such license agreement. The license agreements provide that the licensor has the right to terminate the license if we have not introduced, or at least used our best efforts to introduce, a licensed product in the commercial marketplace in the US, EU, or Japan by December 31, 2020; and otherwise exercise diligence to bring licensed products to market or in the event of our insolvency or bankruptcy. In addition, either party has a right to terminate the license agreement upon a material breach of an obligation under the license agreement by the other party if such breach is not cured and we have the right to terminate upon 90 days notice. In the event of a termination, we are obligated to pay all amounts that accrued prior to such termination. In the event that we breach a material term of one or both of the license agreements, the University has the option to terminate the agreement following the giving of notice and an opportunity to cure any such breach. The license agreement also contains other customary clauses and terms as are common in similar agreements between industry and academia.

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 runs until all the patent-related rights licensed therein have expired, unless terminated earlier. In each of 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 entitled "Cancer Treatment" and filed on May 21, 2010, 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").

- U.S. patent application serial number 61/033,425 entitled “Allogeneic Cancer –Based Immunotherapy” and filed on March 3, 2008 and PCT application number PCT/2009/001330 “Allogeneic Cancer –Based Immunotherapy” filed on March 3, 2009, 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”).
- U.S. patent application serial number 61/033,425 entitled “Heat Shock Protein GP96 Vaccination and Methods of Using Same” filed on March 20, 2008 and PCT application number PCT/ 2009/001727 “Heat Shock Protein GP96 Vaccination and Methods of Using Same “filed on March 19, 2009, 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”).
- U.S. patent application serial number 61/116.971 entitled “HIV/SIV Vaccine for the Generation of Mucosal and Systemic Immunity” filed November 28, 2008 and PCT application number PCT/ 2009/065500” “HIV/SIV Vaccine for the Generation of Mucosal and Systemic Immunity” filed on November 23, 2009 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”).

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 on 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 percent (ranging from 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 provide that the licensee will not have to pay more than above 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 Heat’s Preferred Stock), the University agreed to postpone the payment due dates for each of these four additional licenses. On April 26, 2013, the outstanding balances to the University under the license agreements were paid in full.

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 use it best efforts to introduce, a licensed product in the commercial marketplace in the US, EU, 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 addition, upon an uncured material breach of an obligation under any one of these 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 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 licensee, making the license grant subject to the Bayh-Dole act (35 U.S.C. 200 et seq.), the reservation of 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.

In April 2013, we entered into an agreement with the University under which the University granted us an option to obtain an exclusive license to the following patent-related rights:

- U.S. patent application serial number 12/303,036 entitled "Perforin-2 Proteins" filed December 2, 2008 and U.S. patent application serial number 61/637.455 entitled "Perforin-2 Defense Against Invasive and Multi-drug Resistant Bacteria" filed Modified Heat Shock Protein-Antigenic Peptide Complex " and filed on April 21, 2012; 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 aforementioned applications) of the foregoing, and any re-examinations or reissues of the foregoing.

In consideration for the option, we are obligated to pay the University an option fee of $2,000 and to reimburse the University $3,000 for past patent costs. The term of the option is twelve months and is extendible so long as we continue to pay ongoing patent expenses.

In addition to the licenses obtained from the University, we have entered into agreements with (i) the Regents of the University of Michigan ("U.Mich"); and (ii) the American Type Culture Collection ("ATCC") for the evaluation of, acquisition of commercial rights to, certain biological materials.

In July 2011, we exercised an option agreement with U.Mich and entered into an exclusive license agreement with U.Mich to use, market, offer for sale, sell and/or sublicense materials and processes related to certain bladder cancer cell lines. The term of the license is perpetual, unless terminated earlier by us or by U.Mich. 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. To date, we have paid $22,000 to U.Mich. with respect to such license. 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. The agreement with ATCC provides for an evaluation term of twelve 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 agreement with ATCC has a term of forty years. We paid an evaluation fee and two renewal evaluation fees totaling $15,000, 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. To date, we have paid $15,000 to the ATCC with respect to such license.

Under the license agreements with the University, we have obtained exclusive rights to five different patent families directed to therapeutic compositions and methods related to our vaccine platform and preclinical development program for cancer. These families comprise five PCT applications, six granted patents, sixteen patent validations in European countries, two allowed patent applications and thirty-seven other pending patent applications. These patents and applications cover the United States, Europe and Japan as well as several other countries having commercially significant markets. For each platform or program, our decision to seek patent protection in specific foreign markets, in addition to the U.S., is based on many factors, including one or more of the

following: our available resources, the size of the commercial market, the presence of a potential competitor or a contract manufacturer in the market and whether the legal authorities in the market effectively enforce patent rights. The patent families associated with our *ImPACT* 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 one pending US application, one granted Australian patent, one pending Canadian application, one pending European application, two granted European patents (collectively validated in 16 countries), one pending Japanese application, and one granted Japanese patent. 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 US 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 granted Australian patent, and one pending application each in the U.S., Canada, China, Europe, Israel, India, Japan, South Korea, and Hong Kong. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2029.

"Allogenic 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 granted Australian patent, one allowed U.S. application, and one pending application each in Canada, China, Europe, Israel, 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 U.S., Australia, China, Europe, India, Israel, Japan, and South Korea. Filings in Canada and Hong Kong are intended to be made before the respective deadlines. 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" Within this family are one allowed South African application, and one pending application each in the U.S., Australia, Canada, China, Europe, India, the Philippines, Singapore, and Hong Kong. Not including any patent term adjustments or extensions, the term for patents in this family extends until 2029.

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.

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, or 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 U.S. 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 U.S. 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 $1,958,000, and the manufacturer and/or sponsor under an approved new drug application are also subject to annual product and establishment user fees, currently exceeding $98,000 per product and $526,000 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 twelve 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 six 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 subjects 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 U.S. 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 U.S. 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 p ost-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.

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 twelve 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) eighteen months after the first interchangeable biosimilar is approved if there is no patent challenge, (iii) eighteen 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.

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. 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 U.S., 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. 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. As of January 1995, a mutual recognition procedure is available at the request of the applicant for all medicinal products that are not subject to the centralized procedure. There can be no assurance that the chosen regulatory strategy will secure regulatory approvals 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 $902,938 and $1,246,587 during the years ended December 31, 2012 and 2011, respectively.

Employees

As of May 21, 2013, we had a total of 12 employees and consultants, of which 5 are full-time employees and 7 are part-time employees or consultants. 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.

Facilities

We lease approximately 2,111 square feet of office space in Chapel Hill, North Carolina under a lease that expired December 31, 2012, which could be extended for an additional 24 months on substantially the same terms. The monthly lease payments for these facilities, including common area maintenance and related operating expenses, were approximately $3,870. On December 19, 2012, we entered into a lease modification agreement that extended the lease term until July 31, 2013 and the monthly rent was increased to $4,046. Based on our current operational plans, we believe that such facilities are adequate for our operations for the near future.

Legal Proceedings

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

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 five 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

Name	Age	Position	Served as an Officer or Director Since
Jeffrey Wolf	50	Chairman, Chief Executive Officer and Director	2008
Sandra Silberman, MD, Ph.D.	57	Chief Medical Officer	2013
Matthew E. Czajkowski	64	Chief Financial Officer	2013
Jennifer Harris, Pharm.D.	47	Vice President of Clinical and Regulatory Affairs	2011
Vadim Deyev, MD, Ph.D.	49	Director of Applied Research	2011
John Monahan, Ph.D.	67	Director	2009
Paul Belsky, MD	56	Director	2009
Michael Kharitonov, Ph.D.	49	Director	2009
Edward B. Smith	38	Director	2009

All of the officers listed above are full-time employees of the Company other than Mr. Czajkowski, Dr. Silberman and Dr. Harris who work on a part-time basis.

Jeffrey Wolf, ***Chairman, Chief Executive Officer and Director***

Mr. Wolf founded Heat Biologics in August, 2008. Prior to founding Heat, from June 1997 to March 2011, Mr. Wolf has served as managing director at Seed-One Ventures, LLC a medically-focused venture capital firm. Since founding Seed-One, Mr. Wolf has founded and run several medical companies. Mr. Wolf's start-ups include Avigen, a San Francisco-based gene therapy company where he was a co-founder and director; TyRx Pharma, a Princeton-based company focused on the development of bio-compatible polymers where he was a co-founder and Chairman; EluSys Therapeutics, a New Jersey 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 Miami-based 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 synthetic DNA-based therapeutics and innovative disease-modifying medicines for serious illnesses.

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.

Sandra Silberman, MD, Ph.D., ***Chief Medical Officer***

Dr. Silberman began her career in clinical development at Pfizer, Inc., where from 1992-1999 she initiated the company's first program in clinical oncology and oversaw the introduction of Tarceva™ into clinical trials. From 2000-2004, she served as Senior Director for Novartis Clinical Research, where she led the global development of Gleevec(TM), a highly innovative drug and the first targeted therapy for chronic myelogenous leukemia. Dr. Silberman then joined Eisai Medical Research as Global Therapeutic Area Head (Oncology) in 2004 until 2006, a role in which she advanced six novel compounds into Phases I through III of clinical development. From 2009 until 2013, Dr. Silberman has served as Vice-President of Quintiles.

Dr. Silberman received her Ph.D. in Tumor Immunology from Johns Hopkins University and her M.D. from Cornell University Medical College. She completed a fellowship in hematology/oncology at the Brigham & Women's and the Dana Farber Cancer Institute in Boston. She has numerous publications and is named on several patents in the cancer drug development field, including novel anti-tubulin agents for advanced solid tumors. She is board certified in Internal Medicine and Hematology.

Matthew Czajkowski, ***Chief Financial Officer***

Mr. Czajkowski joined Heat Biologics in May 2013 as its Chief Financial Officer. Prior to joining Heat Biologics, Mr. Czajkowski worked from 2011-2012 as the Chief Executive Officer of NextRay, Inc., a company developing x-ray imaging technology. From 2007 -2010, he served as an independent advisor to various mid stage software and biotech companies where his responsibilities included fundraising. Prior thereto, from 2004-2006, he served as the Chief Financial and Administrative Officer of AAI Pharma Inc. and was part of the work out team for its Chapter 11 filing and from 2000-2004 served as the Chief Financial Officer of Pozen, Inc., a publically traded biotechnology company. Prior to this, Mr. Czajkowski was at Goldman, Sachs & Co. where he founded and ran their Asia/Pacific mergers and acquisitions business. Mr. Czajkowski received his MBA from Harvard University in 1983 and his BA from Harvard University in 1977.

Jennifer Harris, Pharm.D, ***Vice President of Clinical and Regulatory Affairs***

Dr. Harris is responsible for coordinating the clinical development and operational efforts at Heat Biologics. Dr. Harris has over 20 years of oncology-focused clinical trial experience within the pharmaceutical and biotechnology industries and academic clinical research settings. In 2010 until joining Heat Biologics in 2011, she served as a Medical Science Liaison for Dendreon Corporation, where she was instrumental in coordinating Phase 4 clinical trials of sipuleucel-T (Provenge), the first approved autologous cellular immune therapy to treat prostate cancer. From 2009-2010 while at Novaquest, Dr. Harris lead international, multi-disciplinary teams providing operational trial oversight for early-stage compounds, including protocol development, study report preparation, investigator brochure preparation, regulatory submissions, recruitment of investigator sites, and establishment of clinical trial budgets. From 2006-2008, Dr. Harris was Medical Science Liaison at Celgene Corporation, where she helped conduct multiple clinical trials. She has worked on over 20 IND programs from Phase 1-3, as well as several NDAs.

Dr. Harris received her B.S. and Pharm.D. from the University of North Carolina at Chapel Hill. She has also written multiple clinical publications and meeting abstracts.

Vadim V. Deyev, M.D., Ph.D., ***Director of Applied Research***

Dr. Deyev joined Heat Biologics in January 2009 as Director of Applied Research. Prior to joining Heat Biologics, Dr. Deyev worked from 2006-2008 as Associate Scientist of Microbiology and Immunology and Hybridoma and Fusion Protein Core Director at the University of Miami School of Medicine. Working with Dr. Eckhard Podack, Heat Biologics' Scientific Advisor and Chairman of its Scientific Advisory Board, Dr. Deyev has made major contributions to the development of technologies later licensed by the Company. Since 2001, Dr. Deyev has authored numerous publications on immunology and oncology based upon his work with Dr. Podack at the University of Miami. Dr. Deyev joined the team at University of Miami in 1996 until present, after leading the Immunopharmacology Group at the Cancer Research Center in Moscow, Russia Dr. Deyev received his Ph.D. in Immunology/Oncology from Cancer Research Center in Moscow, Russia and his M.D. from Russian State Medical University.

John Monahan, Ph.D., ***Director***

Dr. Monahan is currently the Chief Technology Officer of Synthetic Biologics, Inc., a biotechnology company 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 board member of Tacere Therapeutics, CA. He is also a board member of a number of Irish biotech companies including Genable, Cellix, Luxcel, Identigen, Pharmatrin 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.

Paul Belsky, M.D., *Director*

Dr. Belsky has served on our Board since November 2009. Dr. Belsky is currently a medical and scientific advisor at Seed-One Ventures and has been a partner at Concorde Medical Group, LLC since June of 1998. Dr. Belsky served as a scientific advisor to 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 MD 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.

Michael Kharitonov, Ph.D., *Director*

Dr. Kharitonov has been the Chief Executive Officer of Voleon Capital Management, an investment management firm, since July 2007 until present. He 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 LLC. 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 international 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.

Edward B. Smith, *Director*

Since April 2005, Mr. Smith has been the Managing Partner of Brightline Capital Management, LLC ("BCM"), a New York-based investment firm founded in 2005. BCM is the investment manager of Brightline Ventures I, LLC, Brightline Ventures II, LLC, Brightline Ventures III, LLC and Brightline Capital Partners, LP. 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.

Scientific Advisory Board

In addition to our Board, we also have a scientific advisory board comprised of six individuals. The Scientific Advisory Board is responsible for providing scientific advice and for assessing the scientific progress of our research and development efforts. We have entered into written agreements and confidentiality agreements with all of our members of our Scientific Advisory Board. The members of our Scientific Advisory Board are compensated for their services. Drs. Allison, Stebbing and Nemunaitis are each entitled to receive $1,500 per board meeting in addition to a reimbursement for travel and related. In addition, Drs. Allison, Stebbing and Von Hoff each received options to purchase 15,000 shares of our common stock, which options vest over a four year period. Dr. Von Hoff is entitled to receive $4,000 per onsite advisory board meeting, $2,000 per telephonic meeting and an hourly rate of $500 per hour for consultative discussions with management. Dr. Podack receives consulting fees equal to $3,125 per month subject to increase to $4,167 per month.

Eckhard Podack, M.D., Ph.D.,*Scientific Advisor and Chairman, Scientific Advisory Board*

Dr. Podack, the inventor of the Company's technology, serves as Chairman of its Scientific Advisory Board. Dr. Podack received his medical degree from the Johan Wolfgang Goethe University in Frankfurt in 1968 and his Medical License in 1970. Following service in the German Army as Captain and Battalion Physician, he completed his Ph.D. in the field of Biochemistry at the Georg August University in Gottingen. From 1974-1984 he studied Immunology at the Scripps Clinic and Research Foundation in La Jolla CA where he received an Established Investigatorship from the American Heart Association. Dr. Podack is the discoverer of Perforin and well recognized as the "Father" of the field of core forming proteins. Dr. Podack is the Sylvester Distinguished Professor of Microbiology & Immunology and Medicine and Chairman of the Department of Microbiology at the University of Miami, Miller School of Medicine.

James Allison, Ph.D.,*Scientific Advisor*

Dr. Allison is a leader in the field of immunology, particularly in developing ways to help the immune system recognize and destroy cancer cells. His research is focused on the mechanisms that regulate the immunological response of T lymphocytes, especially strategies to manipulate those responses in clinically relevant areas, including autoimmunity, allergies, vaccinations, and tumor therapy. Dr. Allison is Chairman of the Immunology Program, Director of the Ludwig Center for Cancer Immunotherapy, Attending Immunologist, and David H. Koch Chair in Immunologic Studies at Memorial Sloan-Kettering Cancer Center in New York City.

Sol Barer, Ph.D.,*Scientific Advisor*

Dr. Barer is the former Chairman and Chief Executive Officer of Celgene Corp., a global biopharmaceutical company engaged in the discovery, development, and commercialization of novel therapies for the treatment of cancer and inflammatory diseases. Dr. Barer has spent the last 20 years with Celgene and its predecessor, Celanese Research Company, serving as President, COO, CEO, Senior Vice President of Science and Technology, and Vice President/General Manager of the Chiral Products Division. Dr. Barer received his B.S. from Brooklyn College and his Ph.D. in organic chemistry from Rutgers University.

John Nemunaitis, M.D.,*Scientific Advisor*

Dr. Nemunaitis is an oncologist and Executive Medical Director of the Mary Crowley Cancer Research Centers (MCCRC) and has been exploring novel targeted therapies for treating cancer patients for over 20 years. Dr. Nemunaitis received his B.A. and M.D. degrees from Case Western Reserve University. He completed his residency at Boston City Hospital and then performed his Hematology and Oncology fellowship at the University of Washington and the Fred Hutchinson Cancer Research Center in Seattle from 1988 to 1993. Dr. Nemunaitis came to Dallas in 1993 to establish the clinical research program for Texas Oncology Physicians Association (TOPA). He later established a not-for-profit translational research program (the MCCRC). He is a committee member of the Western Institutional Review Board (WIRB) and recently co-founded a molecular therapeutic/vaccine biotechnology company with GMP manufacturing capacity called Gradalis, Inc. Dr. Nemunaitis has authored over 250 peer-reviewed publications and 36 book chapters. He has instituted study establishment of over 350 trials, overseen FDA sponsored experimental treatment of nearly 4,000 cancer patients at MCCRC, and has carried out 14 government regulatory (FDA, RAC) presentations for biotechnology product development. He is also developer and holder of 8 new molecular and vaccine Investigational New Drug Applications (IND's). His research focus is clinical in orientation and involves determination of molecular signals in order to optimize targeted therapy, development of RNAi based therapeutics, and cancer vaccine approaches.

Justin Stebbing, M.D., MA, FRCP, FRCPath, Ph.D.,*Scientific Advisor*

Dr. Stebbing is a member of the Royal College of Physicians, American Board of Internal Medicine and a Fellow of the Royal College of Pathologists. Originally, Justin trained in medicine at Trinity College Oxford, obtaining a triple first class degree. After completion of junior doctor posts in Oxford, he undertook a residency (junior doctor) training at The Johns Hopkins Hospital in the US, before returning to London to continue his training in oncology at The Royal Marsden. Justin then undertook a PhD, funded by the Medical Research Council, investigating the interplay between the immune system and cancer. Specifically, the role of heat shock proteins in viral infections and tumorigenesis were examined helping in the development of vaccines that are currently in clinical trials. Dr. Stebbing has published over 300 peer-reviewed papers in journals such as the Lancet, New England Journal, Blood, PNAS, The Journal of Clinical Oncology and Annals of Internal Medicine, the majority as first or last author, as well as over 100 book chapters. His publications mainly focus on early and late stage trials of new drugs, mechanisms of disease, and prognostic indicators. He is on the scientific advisory board of a number of biotechnology companies and the editorial board of a number of world-leading journals such as the Journal of Clinical Oncology. He is now a senior lecturer at Imperial College, London.

Daniel D. Von Hoff, M.D., *Scientific Advisor*

Daniel D. Von Hoff, M.D., is currently Physician in Chief and Director of Translational Research at TGen (Translational Genomics Research Institute) in Phoenix, Arizona. He is also Chief Scientific Officer for Scottsdale Healthcare's Clinical Research Institute and Scientific Medical Officer for US Oncology. He holds an appointment as Clinical Professor of Medicine, University of Arizona, College of Medicine. Dr. Von Hoff's major interest is in the development of new anti-cancer agents, both in the clinic and in the laboratory. He and his colleagues were involved in the beginning of the development of many of the agents that are now used routinely, including: mitoxantrone, fludarabine, paclitaxel, docetaxel, gemcitabine, irinotecan, nelarabine, capecitabine, lapatinib and others. At present, he and his colleagues are concentrating on the development of molecularly targeted therapies particularly for patients with advanced pancreatic cancer. Dr. Von Hoff has published more than 559 papers, 134 book chapters and over 1,000 abstracts.

Dr. Von Hoff served as an appointee to President Bush's National Cancer Advisory Board from June 2004 to March 2010. Dr. Von Hoff is the past President of the American Association for Cancer Research (the world's largest cancer research organization), a Fellow of the American College of Physicians, and a member and past board member of the American Society of Clinical Oncology. He is a founder of ILEX™ Oncology, Inc. (acquired by Genzyme after Ilex had 2 agents, alemtuzumab and clofarabine approved for patients with leukemia). He is founder and the Editor Emeritus of Investigational New Drugs – The Journal of New Anticancer Agents; and, Editor-in-Chief of Molecular Cancer Therapeutics. He is also proud to have been a mentor and teacher for multiple medical students, medical oncology fellows, graduate students, and post-doctoral fellows. He is a co-founder of the AACR/ASCO Methods in Clinical Cancer Research Workshop. Dr. Von Hoff currently serves as Physician in Chief for the Translational Genomics Research Institute (TGen) in Phoenix, Arizona and Chief Scientific Officer of Scottsdale Healthcare and US Oncology. Dr. Von Hoff received his MD degree from Columbia University.

Size of Board

Our Third Amended and Restated Certificate of Incorporation provides that the number of directors that constitute our whole board of directors on the date on which the first shares of Series B Preferred Stock were issued shall be not less than seven (subject to vacancies which may be filled stockholders having rights to nominate a director to fill such vacancy) and thereafter shall be fixed in accordance with our bylaws which provide that such number shall be determined from time to time by resolution of the Board. Our Board is currently comprised of five board members, leaving two vacancies. The Third Amended and Restated Certificate of Incorporation provides so long as any shares of Series 1 Preferred Stock remain outstanding, the holders of the Series 1 Preferred Stock voting as single class have the right to elect one director; so long as any shares of Series A remain outstanding, the holders of the Series A Preferred Stock voting as single class have the right to elect one director; so long as any shares of Series B Preferred Stock remain outstanding, the holders of the Series B Preferred Stock voting as single class have the right to elect one director; so long as any shares of Series 1 Preferred Stock remain outstanding, the holders of the Series 1 Preferred Stock and the holders of the common stock voting as single class on an as converted basis have the right to elect two directors, the holders of the common stock and Preferred Stock voting together as a single class on an as converted basis are entitled to elect one director; and the holders of the common stock are entitled to elect one director exclusively as a separate class.

Committees of the Board of Directors

We have applied to have our common stock listed on the NASDAQ Capital Market upon completion of this offering. Under the rules of NASDAQ, independent directors must comprise a majority of a listed company's board of directors within twelve months of the completion of an initial public offering. In addition, the rules of The NASDAQ Stock Market require that: (i) on the date of the completion of the offering, at least one member of each of a listed company's audit, compensation and nominating and corporate governance committees be independent; (ii) within 90 days of the date of the completion of the offering, a majority of the members of such committees be independent; and (iii) within one year of the date of the completion of the offering, all the members of such committees be independent. Audit committee members must also satisfy the independence criteria set forth in Rule 10A-3 under the Exchange Act. Under the rules of The NASDAQ Stock Market, a director will only qualify as an "independent director" if, in the opinion of that company's board of directors, that person does not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director.

In order to be considered to be independent for purposes of Rule 10A-3, a member of an audit committee of a listed company may not, other than in his or her capacity as a member of the audit committee, the board of directors, or any other board committee: (1) accept, directly or indirectly, any consulting, advisory or other compensatory fee from the listed company or any of its subsidiaries or (2) be an affiliated person of the listed company or any of its subsidiaries.

Our Board undertook a review of its composition, the composition of 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 has determined that Dr. Belsky, Dr. Kharitonov Dr. Monahan and Mr. Smith, representing four of our five directors, do not have a relationship that would interfere with the exercise of independent judgment in carrying out the responsibilities of a director and that each of these directors is "independent" as that term is defined under the rules of The NASDAQ Stock Market. In making this determination, our Board considered the relationships that each non-employee director has with us and all other facts and circumstances our Board deemed relevant in determining their independence, including the beneficial ownership of our capital stock by each non-employee director. We intend to comply with the other independence requirements for committees within the time periods specified above.

We currently have: (i) an audit committee comprised of Dr. Monahan,,Mr. Smith, and Mr. Wolf, two of whom are deemed to be independent in accordance with the NASDAQ definition of independence as well as qualify as "audit committee financial experts" as that term is used in Section 407 of Regulation S-K; (ii) a compensation committee comprised of Dr. Belsky, Dr. Monahan and Dr. Kharitonov, each of whom is deemed to be independent in accordance with the NASDAQ definition of independence; and (iii) a nominating and corporate governance committee comprised of Dr. Belsky, Dr. Kharitonov and Mr. Smith. Dr. Monahan and Mr. Smith are deemed to be independent in accordance with the NASDAQ definition of independence. Dr. Monahan and Mr. Wolf qualify as "audit committee financial experts" as that term is used in Section 407 of Regulation S-K.

Leadership Structure

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.

2012 Director Compensation

Compensation of Directors

The following table sets forth information for the fiscal year ended December 31, 2012 regarding the compensation of our directors who at December 31, 2012 were not also named executive officers.

Name	Fees Earned or Paid in Cash	Option Awards(1)	Other Compensation	Total
Paul Belsky, MD	$ —	$ 1,600	$ —	$ 1,600
Michael Kharitonov, Ph.D.	$ —	$ 2,134	$ —	$ 2,134
John Monahan, Ph.D.	$ —	$ 2,134	$ —	$ 2,134
Edward Smith	$ —	$ 1,600	$ —	$ 1,600

(1) The amounts in the "Option Awards" column reflect the dollar amounts recognized as compensation expense for the financial statement reporting purposes for stock options for the fiscal year ended December 31, 2012 in accordance with SFAS 123(R). The fair value of the options was determined using the Black-Scholes model.

Commencing after this offering, directors who are not employees will receive an annual cash fee of $15,000 as well as a cash fee of $5,000 for each committee on which they serve. 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.

EXECUTIVE COMPENSATION

Set forth below is the compensation that was paid to all executive officers during the years ended December 31, 2012 and December 31, 2011 that exceeded $100,000.

Summary Compensation Table

Name and Principal Position	Year	Salary	Bonus	Options	Other(1)	Total
Jeffrey Wolf	2012	$ 250,000	$ 58,333(2)	$ 11,492	$ 11,156	$ 330,981
Chairman & CEO	2011	$ 98,147	$ —	$ 22,984	$ 11,370	$ 132,501
Jennifer Harris	2012	$ 142,904	$ —	$ 2,134	$ —	$ 145,038
Vice President of Clinical and Regulatory Affairs	2011	$ 9,808	$ —	$ —	$ —	$ 9,808

(1) Represents payment for health insurance
(2) This bonus has been accrued, but to date has yet to be paid.

Outstanding Equity Awards At Fiscal Year-End (December 31, 2012)

Name and Principal Position	Number of securities underlying unexercised options/ exercisable	Number of securities underlying unexercised options/un-exercisable	Option exercise price	Option expiration date
Jeffrey Wolf	10,965	—	$ 2.30	12/17/2019
Chairman of the Board, Chief Executive Officer	108,696	—	$ 0.71	4/7/2016
Jennifer Harris	21,740	—	$ 0.64	12/1/2022
Vice President of Clinical and Regulatory Affairs	—	—	—	—

Note: We use the Black-Scholes option-pricing model to value all options issued by the Company.

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. Mr. Wolf receives an annual base salary of $250,000 per year. In addition, Mr. Wolf was entitled to receive an annual bonus of at least $25,000 after his first year of service, $50,000 after his second year of service and $75,000 after his third year of service. He also may 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. 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 twelve months 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.

On June 10, 2008, Mr. Wolf purchased 260,870 shares of our common stock, at a purchase price of $0.0002 per share. Seed-One Holdings VI, LLC and Safeway Medical, LLC, investment funds of which Mr. Wolf is a managing member also purchased 656,427 and 434,783 shares of our common stock, respectively, on June 10, 2008 at a purchase price of $0.0002 per share. In addition, Mr. Wolf purchased 2,622 shares of our Series B Preferred Stock in our recent private placement that together with accrued dividends thereon will convert to 1,150 shares of common stock upon consummation of this offering and he will be issued an additional 46 shares of common stock upon consummation of this offering in lieu of Series B-2 Preferred Stock that Mr.Wolf has committed to purchase upon our receipt of certain grant funding and the shares underlying the warrants to be issued at such time.

On May 15, 2013, we entered into an employment agreement with Matthew E. Czajkowski to act as our Chief Financial Officer. Mr. Czajkowski receives an annual base salary of $105,000 per year for his provision of services to us for fifty-percent of his professional time. In addition, Mr. Czajkowski may 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. Upon execution of the agreement, Mr. Czajkowski was issued options exercisable for 38,364 shares of our common stock, which options are exercisable over a ten year period and vest monthly over three years at an exercise price of $8.81 per share. Upon reaching full-time employment status, he will be entitled to all benefits to which our other executive officers are entitled. If Mr. Czajkowski's employment contract is terminated by the board of directors not for cause (as defined in the agreement) he (or his estate in the event of death) will receive three month's severance. If Mr. Czajkowski's employment contract is terminated for death or disability (as defined in the agreement), he (or his estate in the event of death) will be entitled to receive all unpaid compensation up to such date of termination and such number of options that would have vested upon the date of termination will immediately vest. Under his employment agreement, Mr. Czajkowski has also agreed to customary non-competition provisions.

In November 2011, we entered into an employment agreement with Jennifer Harris to act as our Senior Director of Clinical Development. Ms. Harris received a base salary of $150,000 and ten year options exercisable for 21,740 shares of common stock at an exercise price of $0.64 per share. In May 2013, Ms. Harris' employment agreement with us was amended due to her reduced work schedule and her salary was reduced to $75,000. Ms. Harris was granted 8,696 additional options that will vest over four years and are exercisable at $8.81 per share.

DESCRIPTION OF OUR SECURITIES

General

The following is a summary of the rights of our common stock and Preferred 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 1,861,869 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 and are outstanding and are currently convertible into 49,960 shares of common stock, 2,000,000 shares are designated Series A Preferred Stock and 1,863,128 shares are outstanding and are currently convertible into 810,057 shares of common stock, 4,100,000 are designated as Series B-1 Preferred Stock and 1,891,419 shares are outstanding including accrued dividends and are currently convertible into 828,889 shares of common stock and 2,000,000 are designated Series B-2 Preferred Stock. In addition, upon consummation of a Qualified Public Offering, the investors of our Series B-1 Preferred Stock will be issued an aggregate of 32,879 shares of common stock (assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus), and our obligation to issue, and the investors obligation to purchase, Series B-2 Preferred Stock and warrants upon fulfillment of the conditions specified in our Stock Purchase Agreement with the investors will terminate.

Common Stock

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 was proportionately increased to adjust for the stock split resulting in a proportionate decrease in the number of shares to be issued upon conversion of the Preferred Stock.

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

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, and subject to the rights of the holders of Preferred Stock described below to elect certain directors and vote on an as converted basis together with the holders of the common stock, 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, subject to the rights of the holders of Preferred Stock described below to elect certain directors, 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.

Representative's Warrants

We are registering the warrants (and the shares of common stock underlying such warrants) we have agreed to sell to Aegis Capital Corp. (the representative of the underwriters in this offering) to purchase up to a total of 82,500 shares of common stock (5% of the shares sold in this offering). See "Underwriting—Representative's Warrants" beginning on page 113 of this prospectus for a description of these warrants.

Preferred Stock

Series 1, Series A, Series B

Our Board has the authority, without further action by the shareholders, to issue from time to time the Preferred Stock that remains unissued, all of which has been designated as either Series 1 Preferred Stock or Series A Preferred Stock, which has rights, preferences, privileges and restrictions which are greater than or senior to the rights of the common stock. The issuance of Preferred Stock could adversely affect the voting power of holders of common stock and reduce the likelihood that such holders will receive dividend payments and payments upon liquidation. Such issuance could have the effect of decreasing the market price of the common stock. The issuance of Preferred Stock or even the ability to issue Preferred Stock could have the effect of delaying, deterring or preventing a change in control.

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; (iii) with respect to the Series 1 Preferred Stock, if 2/3 of the Series 1 Preferred Stock holders vote in favor of a conversion then the Series 1 will automatically convert to common stock; and (iv) 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. However, if we do not raise net proceeds of $15,000,000 in this offering, or the holders of shares do not vote in favor of conversion, then the Series 1, Series A, Series B-1 and Series B-2 Preferred Stock will not automatically convert to common stock and will remain outstanding.

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 our Board at a rate of 5% of their original issue price (the “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 we declare or pay a dividend upon the common stock, we must also pay to the holders of the Series A, 1 and B Preferred Stock the dividends that would have been declared with respect to common stock issuable upon conversion of the Series A, 1 and B Preferred Stock; provided, however that we 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 and *pari passu* with the holders of the Series 1 Preferred Stock 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 and *pari passu* with the holders of the Series 1 Preferred Stock an amount per share equal to $4.83 plus any dividends declared but unpaid. In the event of a liquidation, the holders of the Series 1 Preferred Stock are entitled to receive before any payment to the common stock holder and *pari passu* with any distribution to the Series A Preferred Stock an amount per share equal to $5.41 plus any dividends declared but unpaid. After the payment in full of the amounts set forth above, our assets with 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. The Third Amended and Restated Certificate of Incorporation provides that so long as any shares of Series 1 remain outstanding, the holders of the Series 1 Preferred Stock voting as single class have the right to elect one director; so long as any shares of Series A Preferred Stock remain outstanding, the holders of the Series A Preferred Stock voting as single class have the right to elect one director; so long as any shares of Series B Preferred Stock remain outstanding, the holders of the Series B Preferred Stock voting as single class have the right to elect one director; so long as any shares of Series 1 Preferred Stock remain outstanding, the holders of the Series 1 Preferred Stock and the holders of the common stock voting as single class on an as converted basis have the right to elect two directors, the holders of the common stock and Preferred Stock voting together as a single class on an as converted basis are entitled to elect one director; and the holders of the common stock are entitled to elect one director exclusively as a separate class. All of the rights set forth in the preceding sentence terminate upon consummation of a firm commitment underwritten public offering with net proceeds to us of at least $15,000,000 and following such event the Preferred Stock will have no voting rights except as otherwise required by law. Except as otherwise required by Delaware law, and subject to the rights of the holders of Preferred Stock described above to elect certain directors and vote on an as converted basis together with the holders of the common stock, 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, subject to the rights of the holders of Preferred Stock described above to elect certain directors, 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.

Protective Provisions

The Third Amended and Restated Certificate of Incorporation provides that at any time the Preferred Stock is outstanding the following actions cannot be taken without the consent of at least a majority of the Series B Preferred Stock, at least a majority of the Series A Preferred Stock (which majority must include Brightline Ventures III LLC or its affiliates for so long as Brightline Ventures III LLC holds at least 40% of the Series A Preferred Stock), at least a majority of the Series 1 Preferred Stock and at least a majority of the common stock, each voting as a separate class:

(i) amend, alter or repeal any provisions of the Third Amended and Restated Articles of Incorporation or bylaws, unless in connection with a Qualified Public Offering;
(ii) create, or issue any additional classes of capital stock unless the same ranks junior to the Series A Preferred Stock in terms of dividends and liquidation or increase the number of authorized shares of the Series A Preferred Stock or any other class of stock unless it ranks junior to the Series A Preferred Stock in terms of dividends and liquidation, unless in connection with a Qualified Public Offering;
(iii) reclassify, alter or amend any existing security that is *pari passu* with the Series A Preferred Stock in terms of dividends or liquidation if such reclassification would render it senior to the Series A Preferred Stock or reclassify any stock junior to the Series A Preferred Stock in terms of dividends or distributions if such reclassification would render it senior to or *pari passu* with the Series A Preferred Stock, unless in connection with a Qualified Public Offering;
(iv) purchase or redeem or pay or declare any dividend or make any distribution on shares other than as approved by the Board, repurchases of stock of certain former employees, officers or directors or consultants, dividends payable solely in the form of additional shares of stock, unless in connection with a Qualified Public Offering;
(v) Take any action to dissolve or otherwise liquidate the Company; or
(vi) Sell all or substantially all of our assets or effect a merger or consolidation unless the Series A Preferred would receive three (3) times their initial investment.

The Third Amended and Restated Certificate of Incorporation also provides that for so long as a majority of the originally issued shares of Series B Preferred Stock remain outstanding and until we receive $20,000,000 through a financing, grant or licensing or joint venture agreement or we cannot without approval of holders of a majority of the Series B Preferred Stock voting as a single class:

(i) operate any business other than our business as carried out on the original date shares of Series B-1 Preferred Stock were issued;

(ii) make a loan to any entity or subsidiary other than an 80% owned subsidiary;
(iii) dispose or acquire an interest in a business other than under specified circumstances;
(iv) enter into a joint venture or make an investment in excess of $5,000,000;
(v) make or commit to make an expenditure of $5,000,000 or more;
(vi) make a loan of in excess of $5,000;
(vii) issue debt in excess of $5,000,000 other than under existing agreements;
(viii) approve an annual business plan.

Each holder of Preferred Stock has a right to convert each share of its stock into one share of common stock; however such number is adjusted in certain cases including if we issue convertible securities at a price lower than that paid by the Preferred Stockholders.

All of the protective provisions automatically terminate upon consummation of a firm commitment underwritten public offering with gross proceeds to us of at least $15,000,000 and following such event the Preferred Stock will have no voting rights except as otherwise required by applicable law.

Registration Rights

At any time after the earlier of the: (i) March 25, 2014; (ii) 180 days after the closing of an initial public offering; (iii) the completion by us of a merger, consolidation, sale, transfer, lease or other conveyance of all or substantially all of the assets or any other similar business combination or transaction with another company listed on the New York Stock Exchange, the NYSE MKT, the NASDAQ National Market or the NASDAQ SmallCap Market; or (iv) the date upon which we become a reporting company under Section 12 or 15 of the Exchange Act other than in connection with the our initial public offering, (1) the holders of Series B Preferred Stock have two demand registration rights upon written request by holders of at least 50% of the then outstanding Registrable Securities (as defined below) attributable to or originally attributable to the Series B Preferred Stock, or a lesser percentage if the anticipated aggregate offering price of the Registrable Securities requested to be included in any such registration is at least $5,000,000 and (2) the holders of Series 1 and Series A Preferred Stock have two demand registration rights upon written request by holders of at least 50% of the Registrable Securities not attributable or originally attributable to the Series B Preferred Stock. The holders of the Series 1, Series A and Series B Preferred Stock have unlimited piggyback registration rights and unlimited registrations on Form S-3 so long as the aggregate offering price to the public of Registrable Securities proposed to be included in such registration is not less than $1,000,000. Registrable Securities is defined as the shares of common stock: (i) issued or issuable upon conversion of Series 1, Series A and Series B Preferred Stock; (ii) held or deemed held by the holders of the Series 1, Series A and Series B Preferred Stock pursuant to rights of first refusal or other purchase rights; (iii) issued in connection with the exercise of any warrants granted to the Series 1, Series A and Series B Preferred Stockholders; and (iv) issued or issuable as a dividend or other distribution on such shares of common stock. Registrable Securities do not include any securities: (i) sold by a person to the public either pursuant to a registration statement or Rule 144; (ii) sold in a private transaction in which the transferor's rights are not assigned or properly assigned; or (iii) that are eligible for sale without restriction under Rule 144. In addition, the shares underlying the warrant issued to Square 1 Bank are entitled to piggy-back registration rights.

Other Rights

The holders of Series B Preferred Stock have certain preemptive right, rights of first refusal, co-sale and tag along rights, all of which automatically terminate upon consummation of a firm commitment underwritten public offering with net proceeds to us of at least $15,000,000.

Warrants and Stock Options

Warrants

In March 2011, we granted warrants exercisable for an aggregate of 32,610 shares of our common stock to 5 individuals for services rendered in connection with a placement agency agreement we had with Paramount BioCapital, a company no longer in existence. The warrants are exercisable at $0.48 per share, vest immediately upon exercise, contain a cashless exercise feature and expire on March 21, 2021.

In December 2011, we issued a warrant, which as amended, exercisable for 12,940 shares of our Series A Preferred Stock to the North Carolina Biotechnology Center in connection with a loan. This warrant will be converted to the right to purchase common stock at the time of the offering. The warrant is exercisable for a period of ten years at a price per share of $4.83, contains a cashless exercise feature and contains a weighted average price adjustment feature.

In August 2012, we issued a warrant, which as amended, is exercisable for 17,500 shares of our common stock to Square 1 Bank in connection with our loan from them which after adjustments for our 1-for-2.3 stock split will be convertible into 7,609 shares of common stock. The warrant is exercisable for a period of ten years at a price per share of $4.83, contains a cashless exercise feature and contains a weighted average price adjustment feature. If not exercised before the expiration date of the warrant, the warrant shall be deemed to have been exercised on a cashless basis. With respect to any offering conducted at least twelve months after this offering, the holder of the warrant is entitled to piggyback registration rights with respect to the underlying shares. If we request and Square 1 Bank makes Tranche A Term Loans in an aggregate amount in excess of $1,000,000 then the number of shares for which the warrant is exercisable automatically increases by 25,357. If we issue securities with a per share price less than the warrant price of $4.83, the number of shares of common stock issuable upon exercise of the warrant is adjusted as provided in our Certificate of Incorporation for our Series A Preferred Stock.

In March 2013, we consummated the first tranche of our private placement of our Series B Preferred Stock. In addition to issuing Series B-1 Preferred Stock to investors in the offering, we agreed, at the second tranche closing, to issue to each investor, upon their payment for Series B-2 shares that they have committed to acquire, which is conditioned upon our receipt of certain grant funding, we will issue to each such investor a warrant exercisable for two shares of Series B-1 Preferred Stock for each share of Series B-2 Preferred Stock purchased by such investor at the second tranche closing.

Stock Incentive Plan

Pursuant to the terms of our 2009 Stock Incentive Plan, as amended (the "Plan"), we are authorized to grant up to 869,565 awards in the form of options, restricted stock, restricted stock units and other stock based awards exercisable to officers, directors, employees and consultants. As of May 21, 2013, we have issued and outstanding under the Plan options exercisable for 662,543 shares of common stock to a total of 25 individuals and entities for services rendered. Of such amount as of May 21, 2013, 459,326 options had vested and were exercisable, 203,195 options will vest subsequent to May 21, 2013.

In 2009, we issued options for an aggregate of 65,314 shares of our common stock to 5 individuals. As of May 21, 2013, all options have vested and 34,783 had been terminated. Of the vested options exercisable, 19,661 have an exercise price of $2.30 and expire in 2019 and 10,870 have an exercise price of $0.0002 and expire in 2019.

In 2010, we issued options exercisable for an aggregate of 78,266 shares of our common stock at an exercise price of $0.58 per share that expire in 2020 to 9 individuals. As of May 1, 2013, 46,740 of such options had vested and were exercisable and 21,740 had vested and been exercised. The remaining unvested shares of 9,786 will vest by September of 2014.

In 2011, we issued options for an aggregate of 334,031 shares of common stock, of which 8,696 shares had terminated resulting in 325,335 options exercisable as of May 21, 2013. As of May 21, 2013, 268,261 shares of such options vested and were exercisable (of which 159,566 shares of common stock at an exercise price of $0.64 per share that mature in 2020 and 2021 were issued to 11 individuals and options exercisable for an aggregate of 108,696 shares of our common stock at an exercise price of $0.71 per share that mature in 2019 were issued to one individual). The remaining unvested options of 57,073 will vest at various periods over the next three years at an exercise price of $0.64 per share.

In 2012, we issued options exercisable for an aggregate of 178,742 shares of our common stock at an average exercise price of $0.76 per share that mature in 2022 to 6 individuals and 2 entities. As of May 21, 2013, 113,796 of such options vested and were exercisable and 1,087 had been exercised. The remaining unvested shares of 63,859 vest over the next four years.

In 2013, we issued options exercisable for an aggregate of 72,496 shares of our common stock at an average exercise price of $8.81 per share that mature in 2023 to 8 individuals. As of May 21, 2013, 2,132 of such options vested and were exercisable. The remaining unvested shares of 70,364 vest over the next two to four years.

Convertible Notes

In September 2011, convertible notes in the principal amount of $2,623,709 were converted into shares of Series A Preferred Stock, of which notes in the principal amount of $2,273,709 were issued to an investor, the managing member of which is Mr. Smith, a member of our Board. Of such notes, three convertible promissory notes in the aggregate principal amount of $1,447,709 were issued in 2011 to two different note holders and the remaining notes in the aggregate principal amount of $1,176,000 were issued to two investors in 2010. The notes accrued interest at a rate of 3% per annum and were scheduled to mature 18 months after issuance.

In October 2011, in connection with our manufacturing service agreement, we issued a convertible promissory note to our manufacturer, of which $197,099 was outstanding as of December 31, 2012. As of May 1, 2013, 694,478.96 was due such vendor. The note has been extinguished and the payment date for all outstanding payables, including those previously due under the terms of the Note, has been extended until the earlier of July 15, 2013 or this offering or any other financing in which we receive gross proceeds of $2,500,000. If the closing of such financing does not occur prior to July 15, 2013 then one half of the payables owed as of July 15, 2013 shall be due July 15 2013 and the balance shall remain payable until such a financing is consummated.

Notes Payable

In December 2011, we entered into a loan agreement with the North Carolina Biotechnology Center for an amount up to $250,000. The note evidencing the loan matures on December 13, 2014 and bears interest at a rate of 4.25%. The principal is payable in annual installments in the amount of 5% of the outstanding principal commencing on the one year anniversary of the loan and each one year anniversary thereafter. As of August 31 2012, we had repaid all amounts outstanding under the loan.

In August 2012, we entered into a secured loan with Square 1 Bank, the proceeds of which were used in part to pay off the loan from North Carolina Biotechnology Center. The loan and security agreement that we entered with Square 1 Bank in connection with the secured loan (the "Square 1 Agreement") provides that Square 1 Bank will provide us with a term loan in the aggregate principal amount not to exceed $1,000,000 to be used for working capital and capital expenditures (the "Tranche A Loan"). The Tranche A Loan will be available to us until August 7, 2013. The Tranche A Loan is payable on August 7, 2013 in 36 monthly installments of principal and accrued interest. The Tranche A Loan matures on August 7, 2016. If we receive a grant that provides aggregate funds with a value of $16,000,000, we may request that the maximum aggregate of the Tranche A Loan and the Tranche B Loan amount increases to $2,775,000. The Square 1 Agreement, as amended, also provides that if we receive at least $4,500,000 from the sale of our equity to investors after February 15, 2013 but on or before March 31, 2013 (such date we receive such funds being referred to as the "Trigger Date"), we can borrow an additional term loan in the aggregate principal amount not to exceed $1,000,000 to be used for working capital and capital expenditures (the "Tranche B Loan"). Due to the closing of the Series B-1 Preferred Stock private placement in March 2013, we will be able to borrow an additional $1,000,000 under such loan. The Tranche B Loan is payable as interest-only prior to the twelve month anniversary of the Trigger Date month after until August 7, 2013 and thereafter is payable in equal monthly installments of principal plus accrued interest until August 7, 2016. The Tranche B Loan matures on August 7, 2016. The Bank also made one term loan in the amount of $225,000, which was used to repay our debt to North Carolina Biotechnology Center (the "Term B Loan"). The Term B Loan matures December 14, 2014 and requires payments on the one and two year

anniversary of the date of issuance equal to five percent of the principal amount of the loan plus accrued interest, with the balance of the loan being paid on maturity. Once repaid the loans may not be re-borrowed. The loans are secured by a lien on substantially all of our assets, including our stock in our subsidiaries but excluding our intellectual property. Finally, the Bank also made one Non-Formula Advance (the "Non-Formula Advance") in the aggregate principal amount of $200,000 which was paid in full in 2013. As of May 1, 2013, we had outstanding $725,000 under the Square 1 Bank loans. Under the loan agreement, as amended, we were required to raise an additional $4,500,000 on or prior to March 31, 2013. This equity milestone was satisfied and the Company is currently in full compliance with all loan covenants. In connection with the loan, we issued Square 1 Bank a warrant exercisable for 17,500 shares of our common stock which after adjustment for our 1-for-2.3 stock split will be convertible into 7,609 shares of common stock. The warrant is exercisable for ten years at a price of $4.83 which price is subject to adjustment for certain transactions including certain dilutive transactions.

SECURITY OWNERSHIP OF MANAGEMENT AND OTHER BENEFICIAL OWNERS

The table below sets forth information as of May 21, 2013 regarding the beneficial ownership of the Company's common stock, Series A Preferred Stock Series 1 Preferred Stock and Series B-1 Preferred Stock as of the date of this prospectus. Beneficial ownership generally includes voting or investment power with respect to securities. The table reflects ownership by:

* each person or entity who owns beneficially 5% or greater of the shares of the Company's outstanding common stock;
* each of our executive officers and directors; and
* our executive officers and directors as a group.

Except as otherwise set forth therein, each stockholder's pre-offering percentage ownership in the following table is as of May 21, 2013 and is based on a total number of 3,583,654 shares comprised of 1,861,869 shares of common stock, 1,975,628 shares of Series A and Series 1 Preferred Stock issued and outstanding that converts to 860,017 shares of common stock, 1,891,419 shares of Series B-1 Preferred Stock issued and outstanding that together with accrued dividends converts to 828,889 shares of common stock and an additional 32,879 shares of common stock that will be issued to investors of our Series B-1 Preferred Stock upon consummation of this offering (assuming an initial public offering price of $11.00 per share, which is the midpoint of the range set forth in the cover page of this prospectus). All share ownership figures include shares of common stock issued and shares of common stock issuable upon conversion of Preferred Stock issued and shares of common stock issuable upon exercise of options or warrants that had vested as of May 21, 2013 or will vest within 60 days of May 21, 2013, which are deemed outstanding and beneficially owned by such person for purposes of computing his or her percentage ownership, but not for purposes of computing the percentage ownership of any other person. As of May 21, 2013, our Board had authorized a total of 869,565 awards eligible for grant under our 2009 Stock Incentive Plan. As of May 21, 2013, 662,543 options were outstanding.

Unless otherwise indicated the mailing address of each of the stockholders below is c/o Heat Biologics, Inc., 100 Europa Drive, Suite 420, Chapel Hill, North Carolina 27517. 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	Number of Shares Beneficially Owned	Percentage Ownership (Pre-Offering)	Percentage Ownership Post-Offering
Executive Officers & Directors(1)			
Paul Belsky, M.D. (Director)(2)	59,064	1.6%	1.1%
Vadim Deyev, MD, Ph.D.(3)	10,870	*	*
Jennifer Harris, Pharm.D(4)	8,153	*	*
Michael Kharitonov, Ph.D. (Director)(5)	69,580	1.9%	1.3%
John Monahan, Ph.D. (Director)(6)	20,816	*	*
Edward Smith (Director)(7)	711,692	19.8%	13.6%
Sandra Silberman, MD, Ph.D.(8)	15,761		
Jeffrey Wolf (Director, CEO, Treasurer & Secretary)(9)	1,353,371	36.5%	25.3%
Matthew E. Czajkowski (CFO)(10)	2,132	*	*
All Executive Officers & Directors, as a group (9 persons)	2,251,439	59.1%	41.2%
5% Stockholders(1)			
Brightline Ventures III, LLC (11)	697,303	19.5%	13.3%
Eckhard Podack M.D., Ph.D.	260,870	7.3%	5.0%
Orion Holdings V, LLC (12)	695,653	19.4%	13.3%
Seed-One Holdings VI, LLC (12)	536,862	15.0%	10.3%
FW Heat Biologics, LLC (13)	447,937	12.5%	8.6%

*less than 1%

(1) Unless otherwise set forth below, the mailing address of Executive Officers, Directors and 5% or greater holders is c/o the Company, 100 Europa Drive, Suite 420, Chapel Hill, NC 27517.

(2) Dr. Belsky has been issued options exercisable for 26,958 shares of common stock, of which 14,389 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Dr. Belsky includes 43,479 shares of common stock. Includes 2,622 shares of Series B Preferred Stock that together with accrued dividends will convert to 1,150 shares of common stock upon consummation of this offering. Includes 46 shares of common stock to be issued upon consummation of this offering in lieu of Series B-2 Preferred Stock that Dr. Belsky has committed to purchase upon our receipt of certain grant funding and the shares underlying the warrants to be issued at such time.

(3) Dr. Deyev has been issued options exercisable for 10,870 shares of common stock, of which 10,870 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Mr. Deyev.

(4) Dr. Harris has been issued options exercisable for 30,436 shares of common stock, of which 8,153 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Ms. Harris.

(5) Includes 112,500 shares of Series 1 Preferred Stock which convert to 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. Dr. Kharitonov has been issued options exercisable for 34,567 shares of common stock, of which 19,620 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Dr. Kharitonov.

(6) Dr. Monahan has been issued options exercisable for 34,567 shares of common stock, of which 19,620 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Dr. Monahan. Includes 2,622 shares of Series B Preferred Stock, that together with accrued dividends will convert to 1,150 shares of common stock upon consummation of this offering. Includes 46 shares of common stock to be issued upon consummation of this offering in lieu of Series B-2 Preferred Stock that Dr. Monahan has committed to purchase upon our receipt of certain grant funding and the shares underlying the warrants to be issued at such time.

(7) Mr. Smith has been issued options exercisable for 26,958 shares of common stock, of which 14,389 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Mr. Smith. Includes 1,603,795 shares of Series A Preferred Stock that will convert to 697,303 shares of common stock upon consummation of this offering owned by Brightline Ventures III, LLC, of which Mr. Smith disclaims beneficial ownership except to the extent of any pecuniary interest.

(8) Dr. Silberman has been issued options exercisable for 19,566 shares of common stock, of which 15,761 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Dr. Silberman.

(9) 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. Does not include 86,957 shares of common stock beneficially owned by Mr. Wolf's children's trust which Mr. Wolf is not the trustee of. 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. Mr. Wolf has been issued options exercisable for 119,661 shares of common stock, of which 119,661 shares are vested and exercisable within 60 days of May 21, 2013 and are included in the beneficial ownership of Mr. Wolf. Also includes 2,622 shares of Series B Preferred Stock, that together with accrued dividends will convert to 1,150 shares of common stock upon consummation of this offering. Includes 46 shares of common stock to be issued upon consummation of this offering in lieu of Series B-2 Preferred Stock that Mr. Wolf has committed to purchase upon our receipt of certain grant funding and the shares underlying the warrants to be issued at such time.

(10) Mr. Czajkowski has been issued options exercisable for 38,364 shares of common stock, of which 2,132 shares are vested and exercisable within 60 days of May 21, 2013 and included in the number of shares beneficially owned by Mr. Czajkowski.

(11) Includes 1,603,795 shares of Series A Preferred Stock that will convert to 697,303 shares of common stock upon consummation of this offering. Mr. Smith is deemed to beneficially own these shares. Mr. Smith 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.

(12) Mr. Wolf serves as the managing member of such entity. Mr. Wolf is deemed to beneficially own the shares held by such entity as in his role as the managing member he has the control over the voting and disposition of any shares held by this entity. 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 entity.

(13) Includes 983,146 shares of Series B-1 Preferred Stock that together with accrued dividends will convert to 430,840 shares of common stock upon consummation of this offering. Includes 17,097 shares of common stock to be issued upon consummation of this offering in lieu of Series B-2 Preferred Stock that the entity has committed to purchase upon our receipt of certain grant funding and the shares underlying the warrants to be issued at such time held by FW Heat Investors, L.P., of which FW Heat Genpar, LLC is the sole general partner. Jay Hebert is the sole member of FW Heat Genpar, LLC. Mr. Hebert may be deemed to beneficially own the shares held by FW Heat Genpar, LLC, as in his role as the sole member of the FW Heat Genpar, LLC, he has sole control over the voting and disposition of any shares held by FW Heat Investors, L.P. Mr. Hebert 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 FW Heat Investors, L.P.

CERTAIN RELATIONSHIPS AND RELATED-PARTY TRANSACTIONS

The following is a summary of transactions since January 1, 2011 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 last two recent fiscal years 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 of this prospectus entitled "Management—Non-Employee Director Compensation" and "Management — Executive Compensation."

Pursuant to our funding agreement with the University of Miami, the University has been issued shares of Heat Biologics I, Inc. representing 7.5% of the outstanding shares of Heat Biologics I, Inc.

In 2010, we issued convertible notes in the aggregate principal amount of $926,000 to Brightline Ventures III, LLC, the managing member of which is Edward Smith, a member of our board of directors. In 2011, we issued additional convertible notes in the aggregate principal amount of $1,347,709 to the same investor. In September 2011, all of the notes were converted into 1,101,769 shares of Series A Preferred Stock.

We paid Dr. Eckhard Podack, the Chairman of our Scientific and Advisory Board and a holder of in excess of 5% of our outstanding shares of common stock, consulting fees of $18,750 and $43,750 for the years ended December 31, 2012 and 2011, respectively.

We paid Sol Barer, a member of our Scientific and Clinical Advisory Board $50,000 in consulting fees for the year ended December 31, 2011.

During the year ended December 31, 2012 and 2011, we paid $30,910 and $26,000, respectively, to Taffy Williams, a prior member of management, for consulting fees.

During the year ended December 31, 2010, Jeffrey Wolf advanced the Company $12,500. Interest is calculated on the outstanding balance annually at 3.25%. As of December 31, 2012 and 2011, the outstanding balance was $0 and $12,500, respectively. At December 31, 2012 and 2011, accrued interest on this payable was $0 and $686, respectively.

The Company had a related party payable balance of $0 and $12,371 as of December 31, 2012 and 2011, respectively to Jeffrey Wolf.

In June 2012, we sold our 92.5% interest in Heat Biologics II, Inc. to a related party entity in exchange for $9,250 in cash and a receivable of $296,224 based upon an independent appraisal report issued April 2012. Interest accrues on the receivable at a rate of 6% per annum. At December 31, 2012, the Company had a related party receivable from this entity for $9,571 related to invoices received by the Company pertaining to expenses of Heat II incurred subsequent to the sale of Heat II. This amount is also recorded in the Company's accounts payable as of December 31, 2012.

In March 2013, Dr. Belsky, Dr. Monahan and Mr. Wolf each purchased 2,622 shares of the Company's Series B-1 Preferred Stock at a per share price of $2.67 in its private placement that consummated in March 2013.

SHARES ELIGIBLE FOR FUTURE SALE

Before this offering, there was no public market in the United States for our securities and a significant public market for our securities may not develop or be sustained after this offering. As described below, approximately 3,583,654 shares of our common stock that will be outstanding upon consummation of this offering will not be available for sale immediately after this offering due to certain contractual and securities law restrictions on resale. Sales of substantial amounts of our common stock in the public market after these restrictions lapse could cause the prevailing market price to decline and limit our ability to raise equity capital in the future.

Upon completion of this offering, we will have outstanding an aggregate of 5,233,654 shares of common stock (5,481,154) shares if the underwriters exercise their over-allotment option in full). In addition, we have reserved:

- 53,159 shares for issuance in connection with warrants outstanding as of May 21, 2013;
- 662,543 shares for issuance in connection with options outstanding as of May 21, 2013;
- 84,314 shares reserved for future issuance in under our equity incentive plans as of May 1, 2012 of which 21,348 shares have been reserved for option grants to be issued upon consummation of our initial public offering; and

Of these shares, the 1,650,000 shares sold in this offering (1,897,500) shares if the underwriters exercise their over-allotment option in full) will be freely transferable without restriction or further registration under the Securities Act, except for any shares that are acquired by affiliates as that term is defined in Rule 144 under the Securities Act ("Rule 144"). The remaining 3,583,654 shares of common stock held by existing stockholders are "restricted securities," as that term is defined in Rule 144 under the Securities Act. Restricted securities may be sold in the public market only if registered or if their resale qualifies for exemption from registration described below under Rule 144 or 701 promulgated under the Securities Act.

As a result of contractual restrictions described below and the provisions of Rules 144 and 701, the shares sold in this offering and the restricted securities will be available for sale in the public market as follows:

- the 1,650,000 shares sold in this offering (1,897,500 shares if the underwriters exercise their over-allotment option in full) will be eligible for resale immediately; and
- approximately 3,583,654 restricted shares will be eligible for sale in the public market upon expiration of lock-up agreements 180 days after the date of this prospectus, subject in certain circumstances to the volume, manner of sale and other limitations under Rule 144 and Rule 701.

Rule 144

In general, under Rule 144 as currently in effect, once we have been subject to the reporting requirements under the Exchange Act for at least 90 days a person (or persons whose shares are aggregated) who is not deemed to have been an affiliate of ours at any time during the three months preceding a sale, and who has beneficially owned restricted securities within the meaning of Rule 144 for at least six months, would be entitled to sell those shares, subject only to the availability of current public information about us. A non-affiliated person who has beneficially owned restricted securities within the meaning of Rule 144 for at least one year would be entitled to sell those shares without regard to the availability of current public information about us.

An affiliate of ours who has beneficially owned restricted shares of our common stock for at least twelve months (or six months, provided that such sale occurs after we have been subject to the reporting requirements under the Exchange Act for at least 90 days) would be entitled to sell, within any three-month period, a number of shares that does not exceed the greater of (i) 1% of shares of our common stock then outstanding and (ii) the average weekly trading volume of our common stock on the NASDAQ Capital Market during the four calendar weeks preceding the filing of a notice on Form 144 with respect to such sale.

Sales under Rule 144 by our affiliates or persons selling shares on behalf of our affiliates are also subject to manner of sale provisions, notice requirements and the availability of current public information about us.

Rule 701

Under Rule 701, common stock acquired upon the exercise of certain currently outstanding options or pursuant to other rights granted under our stock plans may be resold, to the extent not subject to lock-up agreements, (a) by persons other than affiliates, beginning 90 days after the effective date of this offering, and (b) by affiliates, subject to the manner-of-sale, volume limitations, current public information and filing requirements of Rule 144, in each case, without compliance with the holding period requirement of Rule 144. The Rule 701 shares held by our executive officers, directors and substantially all of our stockholders are, however, subject to lock-up agreements and will only become eligible for sale upon the expiration of the contractual lock-up agreements. The underwriters may release all or any portion of the securities subject to lock-up agreements.

Lock-Up Agreements

In connection with this offering, our directors and officers and all holders of our outstanding equity securities, on an as converted basis, agreed not to sell or otherwise dispose of any securities without the prior written consent of Aegis Capital Corp. for a period of 180 days after the date of this prospectus, subject to certain terms and conditions. See the section entitled "Underwriting" for more information regarding such restrictions.

Registration Rights

After the closing of this offering, certain holders of our securities will be entitled to rights with respect to the registration of their shares under the Securities Act. At any time after the: (i) one year anniversary of their investment; (ii) 180 days after the closing of an initial public offering; (iii) the completion by us of a merger, consolidation, sale, transfer, lease or other conveyance of all or substantially all of the assets or any other similar business combination or transaction with another company listed on the New York Stock Exchange, the NYSE MKT, the NASDAQ National Market or the NASDAQ SmallCap Market; or (iv) the date upon which we become a reporting company under Section 12 or 15 of the Exchange Act other than in connection with our initial public offering, (1) the holders of Series B Preferred Stock have two demand registration rights upon request by holders of at least 50% of the then outstanding Registrable Securities (as defined below) attributable to or originally attributable to the Series B Preferred Stock, or a lesser percentage if the anticipated aggregate offering price of the Registrable Securities requested to be included in any such registration is at least $5,000,000; and (2) the holders of Series 1 and Series A Preferred Stock have two demand registration rights upon written request by holders of at least *50%* of the Registrable Securities not attributable or originally attributable to the Series B Preferred Stock. The holders of the Series 1, Series A and Series B Preferred Stock shall have unlimited piggyback registration rights and unlimited registrations on Form S-3 so long as the aggregate offering price to the public of Registrable Securities proposed to be included in such registration is not less than $1,000,000. Registrable Securities is defined as the shares of common stock: (i) issued or issuable upon conversion of Series 1, Series A and Series B Preferred Stock; (ii) held or deemed held by the holders of the Series 1, Series A and Series B Preferred Stock pursuant to rights of first refusal or other purchase rights; (iii) issued in connection with the exercise of any warrants granted to the Series 1, Series A and Series B Holders; and (iv) issued or issuable as a dividend or other distribution on such shares of common stock. Registrable Securities do not include any securities: (i) sold by a person to the public either pursuant to a registration statement or Rule 144; (ii) sold in a private transaction in which the transferor's rights are not assigned or properly assigned; or (iii) that are eligible for sale without restriction under Rule 144. In addition, the shares underlying the warrant issued to Square 1 Bank are entitled to piggyback registration rights.

MATERIAL U.S. FEDERAL INCOME TAX CONSEQUENCES TO NON-U.S. HOLDERS OF OUR COMMON STOCK

The following discussion describes the material U.S. federal income tax consequences to non-U.S. holders (as defined below) of the acquisition, ownership and disposition of our common stock issued pursuant to the initial public offering. This discussion is not a complete analysis of all potential U.S. federal income tax consequences and does not address any tax consequences arising under any state, local or foreign tax laws, any income tax treaties, or any other U.S. federal tax laws, including U.S. federal estate and gift tax laws (except as specifically addressed herein with respect to U.S federal estate taxes). This discussion is based on the Internal Revenue Code of 1986, as amended ("Code"), U.S. Treasury Regulations promulgated thereunder, judicial decisions and published rulings and administrative pronouncements of the Internal Revenue Service ("IRS"), all as in effect on the date of the initial public offering. These authorities may change, possibly retroactively, resulting in tax consequences different from those discussed below. No rulings have been or will be sought from the IRS with respect to the matters discussed below, and there can be no assurance that the IRS will not take a different position regarding the tax consequences of a non-U.S. holder's acquisition, ownership or disposition of our common stock or that any such position would not be sustained by a court.

This discussion is limited to non-U.S. holders who purchase our common stock pursuant to this offering and who hold our common stock as "capital assets" within the meaning of Code Section 1221 (generally, property held for investment). This discussion does not address all U.S. federal income tax consequences that may be relevant to a non-U.S. holder in light of the holder's particular circumstances. It also does not consider any specific facts or circumstances that may be relevant to non-U.S. holders subject to special rules under the U.S. federal income tax laws, including, without limitation, U.S. expatriates, banks, financial institutions, insurance companies, regulated investment companies, real estate investment trusts, "controlled foreign corporations," "passive foreign investment companies," corporations that accumulate earnings to avoid U.S. federal income tax, brokers, dealers or traders in securities, commodities or currencies, partnerships or other pass-through entities (or investors in such entities), tax-exempt organizations, tax-qualified retirement plans, persons subject to the alternative minimum tax or the unearned income Medicare contribution tax, and persons holding our common stock as part of a straddle, hedge or other risk reduction strategy or as part of a conversion transaction or other integrated investment.

WE RECOMMEND THAT PROSPECTIVE INVESTORS CONSULT THEIR TAX ADVISORS REGARDING THE PARTICULAR U.S. FEDERAL INCOME TAX CONSEQUENCES TO THEM OF THE ACQUISITION, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK, AS WELL AS ANY TAX CONSEQUENCES ARISING UNDER ANY STATE, LOCAL OR FOREIGN TAX LAWS, ANY APPLICABLE INCOME TAX TREATIES, OR ANY OTHER U.S. FEDERAL TAX LAWS (INCLUDING ESTATE AND GIFT TAX LAWS).

Definition of Non-U.S. Holder

As used in this discussion, a non-U.S. holder is any beneficial owner of our common stock who is not treated as a partnership for U.S. federal income tax purposes and is not:

- an individual citizen or resident of the United States;
- a corporation (or other entity treated as a corporation for U.S. federal income tax purposes) created or organized under the laws of the United States, any state thereof or the District of Columbia;
- an estate, the income of which is subject to U.S. federal income tax regardless of its source; or
- a trust if (i) a U.S. court is able to exercise primary supervision over its administration and one or more U.S. persons have authority to control all its substantial decisions or (ii) the trust was in existence on August 20, 1996, was treated as a U.S. person prior to that date and validly elected to continue to be so treated.

If any entity treated as a partnership for U.S. federal income tax purposes holds our common stock, the tax treatment of a partner generally will depend on the status of the partner and the activities of the partnership. Partnerships and their partners should consult their tax advisors as to the tax consequences to them of the acquisition, ownership and disposition of our common stock.

Distributions on Our Common Stock

As described in the section entitled, "Dividend Policy," we do not anticipate paying dividends on our common stock in the foreseeable future. If we make a distribution of cash or other property with respect to our common stock, the distribution generally will constitute a dividend for U.S. federal income tax purposes to the extent paid from our current or accumulated earnings and profits, as determined under U.S. federal income tax principles. Amounts not treated as dividends for U.S. federal income tax purposes will constitute a return of capital and will first be applied against and reduce a holder's adjusted tax basis in its common stock, but not below zero. Any remaining excess will be treated as capital gain from the sale of property.

Dividends paid to a non-U.S. holder of our common stock that are not effectively connected to the holder's conduct of a U.S. trade or business generally will be subject to U.S. federal withholding tax at a rate of 30% of the gross amount of the dividends, or a lower rate specified by an applicable tax treaty. To receive the benefit of a reduced treaty rate, a non-U.S. holder must furnish to us or our paying agent a valid IRS Form W-8BEN (or applicable successor form) certifying the holder's qualification for the reduced rate. A non-U.S. holder may be required to obtain a U.S. taxpayer identification number to claim treaty benefits. This certification must be provided to us or our paying agent prior to the payment of dividends and may be required to be updated periodically. Non-U.S. holders that do not timely provide us or our paying agent with the required certification, but which qualify for a reduced treaty rate, may obtain a refund of any excess amounts withheld by timely filing an appropriate claim for refund with the IRS. Non-U.S. holders should consult their tax advisors regarding their entitlement to benefits under a relevant income tax treaty.

If a non-U.S. holder holds our common stock in connection with the conduct of a trade or business in the United States, and dividends paid on the common stock are effectively connected with the holder's U.S. trade or business and, if an income tax treaty applies, the non-U.S. holder maintains a "permanent establishment" in the United States to which the dividends are attributable, the non-U.S. holder will be exempt from U.S. federal withholding tax, if the appropriate certification is provided. To claim the exemption for effectively connected income, the non-U.S. holder must furnish to us or our paying agent a properly executed IRS Form W-8ECI (or applicable successor form) prior to the payment of the dividends. Any dividends paid on our common stock that are effectively connected with a non-U.S. holder's U.S. trade or business generally will be subject to U.S. federal income tax on a net income basis at the regular graduated U.S. federal income tax rates in the same manner as if the holder were a resident of the United States, unless the holder is entitled to the benefits of a tax treaty that provides otherwise. A non-U.S. holder that is a foreign corporation also may be subject to a branch profits tax equal to 30% (or a lower rate specified by an applicable tax treaty) of its effectively connected earnings and profits for the taxable year that are attributable to such dividends. Non-U.S. holders should consult any applicable tax treaties that may provide for different rules.

Gain on Disposition of Our Common Stock

Subject to the discussions below regarding backup withholding and foreign accounts, a non-U.S. holder generally will not be subject to U.S. federal income tax on any gain realized upon the sale or other disposition of our common stock unless:

- the gain is effectively connected with the non-U.S. holder's conduct of a trade or business in the United States;
- the non-U.S. holder is a nonresident alien individual present in the United States for 183 days or more during the taxable year of the disposition and certain other requirements are met; or
- our common stock constitutes a U.S. real property interest by reason of our status as a U.S. real property holding corporation at any time within the shorter of the five-year period preceding the disposition or the non-U.S. holder's holding period for our common stock and certain other requirements are met.

Unless an applicable tax treaty provides otherwise, gain described in the first bullet point above will be subject to U.S. federal income tax on a net income basis at the regular graduated U.S. federal income tax rates in the same manner as if the holder were a resident of the United States. Non-U.S. holders that are foreign corporations also may be subject to a branch profits tax equal to 30% (or a lower rate specified by an applicable tax treaty) of its effectively connected earnings and profits for the taxable year that are attributable to such gain. Non-U.S. holders should consult any applicable tax treaties that may provide for different rules.

Gain described in the second bullet point above will be subject to U.S. federal income tax at a flat 30% rate (or a lower rate specified by an applicable income tax treaty), but may be offset by U.S. source capital losses.

With respect to the third bullet point above, we believe we currently are not and will not become a U.S. real property holding corporation. However, because the determination of whether we are a U.S. real property holding corporation generally depends on whether the fair market value of our U.S. real property interests equals or exceeds 50% of the sum of the fair market value of our other trade or business assets and our worldwide real property interests, there can be no assurance that we will not become a U.S. real property holding corporation in the future. In the event we do become a U.S. real property holding corporation, as long as our common stock is regularly traded on an established securities market, our common stock will constitute a U.S. real property interest only with respect to a non-U.S. holder that actually or constructively holds more than five percent of our common stock at some time during the shorter of the five-year period preceding the disposition or the non-U.S. holder's holding period for our common stock. Any taxable gain generally will be taxed in the same manner as gain that is effectively connected with the conduct of a U.S. trade or business, except that the branch profits tax will not apply.

Information Reporting and Backup Withholding

We must report annually to the IRS and to each non-U.S. holder the amount of dividends on our common stock paid to the holder and the amount of any tax withheld with respect to those dividends. These information reporting requirements apply even if no withholding was required because the dividends were effectively connected with the holder's conduct of a U.S. trade or business, or withholding was reduced or eliminated by an applicable tax treaty. This information also may be made available under a specific treaty or agreement with the tax authorities in the country in which the non-U.S. holder resides or is established.

Backup withholding, currently at a rate of 28%, generally will not apply to payments of dividends to a non-U.S. holder of our common stock provided the non-U.S. holder furnishes to us or our paying agent the required certification as to its non-U.S. status (typically, by providing a valid IRS Form W-8BEN or W-8ECI) or an exemption is otherwise established.

Payment of the proceeds from a non-U.S. holder's disposition of our common stock made by or through a foreign office of a broker will not be subject to information reporting or backup withholding, except that information reporting (but generally not backup withholding) may apply to those payments if the broker does not have documentary evidence that the beneficial owner is a non-U.S. holder, an exemption is not otherwise established and the broker is:

- a U.S. person, as defined in the Code;
- a controlled foreign corporation for U.S. federal income tax purposes;
- a foreign person 50% or more of whose gross income is effectively connected with a U.S. trade or business for a specified three-year period; or
- a foreign partnership if at any time during its tax year (1) one or more of its partners are U.S. persons who hold in the aggregate more than 50% of the income or capital interest in the partnership or (2) it is engaged in the conduct of a U.S. trade or business.

Payment of the proceeds from a non-U.S. holder's disposition of our common stock made by or through the U.S. office of a broker generally will be subject to information reporting and backup withholding unless the non-U.S. holder certifies as to its non-U.S. status (such as by providing a valid IRS Form W-8BEN or W-8ECI) or otherwise establishes an exemption from information reporting and backup withholding.

Backup withholding is not an additional tax. Taxpayers may use amounts withheld as a credit against their U.S. federal income tax liability or may claim a refund if they timely provide certain information to the IRS.

U.S. Federal Estate Tax

Shares of common stock held (or deemed held) by an individual who is a non-U.S. holder at the time of his or her death will be included in such non-U.S. holder's gross estate for U.S. federal estate tax purposes, unless an applicable estate tax treaty provides otherwise, and thus may be subject to U.S. federal estate tax.

Additional Withholding Tax Relating to Foreign Accounts

Legislation enacted in 2010 will generally impose a U.S. federal withholding tax of 30% on dividends and the gross proceeds of a disposition of our common stock paid after December 31, 2012 to a foreign financial institution (whether holding stock for its own account or on behalf of its account holders/investors) unless such institution enters into an agreement with the U.S. government to withhold on certain payments and to collect and provide to the U.S. tax authorities substantial information regarding U.S. account holders of such institution (which includes certain equity and debt holders of such institution, as well as certain account holders that are foreign entities with U.S. owners). The legislation will also generally impose a U.S. federal withholding tax of 30% on dividends and the gross proceeds of a disposition of our common stock paid after December 31, 2012 to any other foreign entity unless such entity provides the withholding agent with a certification identifying the direct and indirect U.S. owners of the entity.

Recent administrative guidance provides, however, that such withholding would generally apply only to dividends paid on or after January 1, 2014, and to other "withholdable payments" (including payments of gross proceeds from a sale or other disposition of our common stock) made on or after January 1, 2017. Under certain circumstances, a holder might be eligible for refunds or credits of such taxes. Prospective investors are encouraged to consult with their own tax advisors regarding the possible impact of these rules on their investment in our common stock.

WE RECOMMEND THAT PROSPECTIVE INVESTORS CONSULT THEIR TAX ADVISORS REGARDING THE PARTICULAR U.S. FEDERAL INCOME TAX CONSEQUENCES TO THEM OF THE PURCHASE, OWNERSHIP AND DISPOSITION OF OUR COMMON STOCK, AS WELL AS ANY TAX CONSEQUENCES ARISING UNDER ANY STATE, LOCAL OR FOREIGN TAX LAWS, ANY APPLICABLE INCOME TAX TREATIES, OR ANY OTHER U.S. FEDERAL TAX LAWS (INCLUDING ESTATE AND GIFT TAX LAWS).

UNDERWRITING

Aegis Capital Corp. is acting as the sole book-running manager of the offering and as representative of the underwriters, or the Representative. We have entered into an underwriting agreement, dated , 2013, with the Representative. Subject to the terms and conditions of the underwriting agreement, we have agreed to sell to each underwriter named below and each underwriter named below has severally and not jointly agreed to purchase from us, at the public offering price per share less the underwriting discounts set forth on the cover page of this prospectus, the number of shares of common stock listed next to its name in the following table:

Underwriter	Number of Shares
Aegis Capital Corp.	
Cantor Fitzgerald & Co.	
Total	1,650,000

The underwriters are committed to purchase all the shares of common stock offered by us other than those covered by the option to purchase additional shares described below, if they purchase any shares. The obligations of the underwriters may be terminated upon the occurrence of certain events specified in the underwriting agreement. Furthermore, pursuant to the underwriting agreement, the underwriters' obligations are subject to customary conditions, representations and warranties contained in the underwriting agreement, such as receipt by the underwriters of officers' certificates and legal opinions.

We have agreed to indemnify the underwriters against specified liabilities, including liabilities under the Securities Act, and to contribute to payments the underwriters may be required to make in respect thereof.

The underwriters are offering the shares, subject to prior sale, when, as and if issued to and accepted by them, subject to approval of legal matters by their counsel and other conditions specified in the underwriting agreement. The underwriters reserve the right to withdraw, cancel or modify offers to the public and to reject orders in whole or in part.

We have granted the underwriters an over-allotment option. This option, which is exercisable for up to 45 days after the date of this prospectus, permits the underwriters to purchase a maximum of 247,500 additional shares (15% of the shares sold in this offering) from us to cover over-allotments, if any. If the underwriters exercise all or part of this option, they will purchase shares covered by the option at the public offering price per share that appears on the cover page of this prospectus, less the underwriting discount. If this option is exercised in full, the total price to the public will be $ and the total net proceeds, before expenses, to us will be $.

Discount. The following table shows the public offering price, underwriting discount and proceeds, before expenses, to us. The information assumes either no exercise or full exercise by the underwriters of their over-allotment option.

	Per Share	Total Without Over-allotment Option	Total With Over-allotment Option
Public offering price	$	$	$
Underwriting discount (7%)	$	$	$
Non-accountable expense allowance (1%) [1]	$	$	$
Proceeds, before expenses, to us	$	$	$

(1) The expense allowance of 1% is not payable with respect to the shares sold upon exercise of the underwriters' over-allotment option.

The underwriters propose to offer the shares to the public at the public offering price per share set forth on the cover of this prospectus. In addition, the underwriters may offer some of the shares to other securities dealers at such price less a concession of $ per share. If all of the shares offered by us are not sold at the public offering price per share, the underwriters may change the offering price per share and other selling terms by means of a supplement to this prospectus.

We have paid an expense deposit of $25,000 to the Representative, which will be applied against the accountable expenses that will be paid by us to the Representative in connection with this offering. The underwriting agreement provides that in the event the offering is terminated, the $25,000 expense deposit paid to the Representative will be returned to us to the extent that offering expenses are not actually incurred by the Representative.

We have also agreed to pay the Representative's expenses relating to the offering, including (a) all fees, expenses and disbursements relating to background checks of our officers and directors in an amount not to exceed $2,500 per individual and $15,000 in the aggregate; (b) all filing fees incurred in clearing this offering with FINRA (and the reasonable fees of FINRA counsel, but only up to $15,000); (c) all fees, expenses and disbursements relating to the registration, qualification or exemption of securities offered under the securities laws of foreign jurisdictions designated by the underwriters; (d) upon successfully completing this offering, $21,775 for the underwriters' use of Ipreo's book-building, prospectus tracking and compliance software for this offering; and (e) upon successfully completing this offering, up to $20,000 of the Representative's actual accountable road show expenses for the offering.

We estimate that the total expenses of the offering payable by us, excluding underwriting discounts and commissions, will be approximately $506,725.

Discretionary Accounts. The underwriters do not intend to confirm sales of the securities offered hereby to any accounts over which they have discretionary authority.

Lock-Up Agreements. Pursuant to certain "lock-up" agreements, we, our executive officers and directors, And all holders of our outstanding shares of common stock on a fully diluted basis (including shares underlying options, warrants and convertible securities) have agreed, subject to certain exceptions, not to offer, sell, assign, transfer, pledge, contract to sell, or otherwise dispose of or announce the intention to otherwise dispose of, or enter into any swap, hedge or similar agreement or arrangement that transfers, in whole or in part, the economic risk of ownership of, directly or indirectly, engage in any short selling of any common stock or securities convertible into or exchangeable or exercisable for any common stock, whether currently owned or subsequently acquired, without the prior written consent of the Representative, for a period of 180 days from the date of effectiveness of the offering.

Representative's Warrants. We have agreed to issue to the Representative warrants to purchase up to a total of 82,500 shares of common stock (5% of the shares of common stock sold in this offering, but excluding the over-allotment option). The warrants will be exercisable at any time, and from time to time, in whole or in part, during the four-year period commencing one year from the effective date of the offering, which period shall not extend further than five years from the effective date of the offering in compliance with FINRA Rule 5110(f)(2)(H)(i). The warrants are exercisable at a per share price equal to $ per share, or 125% of the public offering price per share in the offering. The warrants have been deemed compensation by FINRA and are therefore subject to a 180 day lock-up pursuant to Rule 5110(g)(1) of FINRA. The Representative (or permitted assignees under Rule 5110(g)(1)) will not sell, transfer, assign, pledge, or hypothecate these warrants or the securities underlying these warrants, nor will they engage in any hedging, short sale, derivative, put, or call transaction that would result in the effective economic disposition of the warrants or the underlying securities for a period of 180 days from the date of effectiveness. In addition, the warrants provide for registration rights upon request, in certain cases. The demand registration right provided will not be greater than five years from the effective date of the offering in compliance

with FINRA Rule 5110(f)(2)(H)(iv). The piggyback registration right provided will not be greater than seven years from the effective date of the offering in compliance with FINRA Rule 5110(f)(2)(H)(v). We will bear all fees and expenses attendant to registering the securities issuable on exercise of the warrants other than underwriting commissions incurred and payable by the holders. 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.

Right of First Refusal. Subject to certain limited exceptions, until twelve (12) months after the date of effectiveness of the offering, the Representative has a right of first refusal to purchase for its account or to sell for our account, or any subsidiary or successor, any securities of our company or any such subsidiary or successor which we or any subsidiary or successor may seek to sell in public or private equity and public debt offerings during such twelve (12)-month period.

NASDAQ Capital Market Listing. We have applied for the listing of our common stock on the NASDAQ Capital Market under the symbol "HTBX."

Electronic Offer, Sale and Distribution of Shares. A prospectus in electronic format may be made available on the websites maintained by one or more of the underwriters or selling group members, if any, participating in this offering and one or more of the underwriters participating in this offering may distribute prospectuses electronically. The Representative may agree to allocate a number of shares to underwriters and selling group members for sale to their online brokerage account holders. Internet distributions will be allocated by the underwriters and selling group members that will make internet distributions on the same basis as other allocations. Other than the prospectus in electronic format, the information on these websites is not part of, nor incorporated by reference into, this prospectus or the registration statement of which this prospectus forms a part, has not been approved or endorsed by us or any underwriter in its capacity as underwriter, and should not be relied upon by investors.

Determination of the Initial Public Offering Price. Prior to this offering, there has been no public market for our common stock. The initial public offering price was determined through negotiations between us and the Representative of the underwriters. In addition to prevailing market conditions, the factors considered in determining the initial public offering price included the following:

- the information included in this prospectus and otherwise available to the Representative;
- the valuation multiples of publicly traded companies that the Representative believes to be comparable to us;
- our financial information;
- our prospects and the history and the prospectus of the industry in which we compete;
- an assessment of our management, its past and present operations, and the prospects for, and timing of, our future revenues;
- the present state of our development; and
- the above factors in relation to market values and various valuation measures of other companies engaged in activities similar to ours.

An active trading market for our common stock may not develop. It is also possible that, after the offering, the shares will not trade in the public market at or above the initial public offering price.

Stabilization. In connection with this offering, the underwriters may engage in stabilizing transactions, over-allotment transactions, syndicate-covering transactions, penalty bids and purchases to cover positions created by short sales.

- Stabilizing transactions permit bids to purchase shares so long as the stabilizing bids do not exceed a specified maximum, and are engaged in for the purpose of preventing or retarding a decline in the market price of the shares while the offering is in progress.

- Over-allotment transactions involve sales by the underwriters of shares in excess of the number of shares the underwriters are obligated to purchase. This creates a syndicate short position which may be either a covered short position or a naked short position. In a covered short position, the number of shares over-allotted by the underwriters is not greater than the number of shares that they may purchase in the over-allotment option. In a naked short position, the number of shares involved is greater than the number of shares in the over-allotment option. The underwriters may close out any short position by exercising their over-allotment option and/or purchasing shares in the open market.
- Syndicate covering transactions involve purchases of shares in the open market after the distribution has been completed in order to cover syndicate short positions. In determining the source of shares to close out the short position, the underwriters will consider, among other things, the price of shares available for purchase in the open market as compared with the price at which they may purchase shares through exercise of the over-allotment option. If the underwriters sell more shares than could be covered by exercise of the over-allotment option and, therefore, have a naked short position, the position can be closed out only by buying shares in the open market. A naked short position is more likely to be created if the underwriters are concerned that after pricing there could be downward pressure on the price of the shares in the open market that could adversely affect investors who purchase in the offering.
- Penalty bids permit the Representative to reclaim a selling concession from a syndicate member when the shares originally sold by that syndicate member are purchased in stabilizing or syndicate covering transactions to cover syndicate short positions.

These stabilizing transactions, syndicate covering transactions and penalty bids may have the effect of raising or maintaining the market price of our shares or common stock or preventing or retarding a decline in the market price of our shares or common stock. As a result, the price of our common stock in the open market may be higher than it would otherwise be in the absence of these transactions. Neither we nor the underwriters make any representation or prediction as to the effect that the transactions described above may have on the price of our common stock. These transactions may be effected on The NASDAQ Capital Market, in the over-the-counter market or otherwise and, if commenced, may be discontinued at any time.

Passive market making. In connection with this offering, underwriters and selling group members may engage in passive market making transactions in our common stock on The NASDAQ Capital Market in accordance with Rule 103 of Regulation M under the Exchange Act, during a period before the commencement of offers or sales of the shares 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, then that bid must then be lowered when specified purchase limits are exceeded.

Other Relationships. Certain of the underwriters and their affiliates have provided, and may in the future provide, various investment banking, commercial banking and other financial services for us and our affiliates for which they have received, and may in the future receive, customary fees. However, except as disclosed in this prospectus, we have no present arrangements with any of the underwriters for any further services.

Offer restrictions outside the United States

Other than in the United States, no action has been taken by us or the underwriters that would permit a public offering of the securities offered by this prospectus in any jurisdiction where action for that purpose is required. The securities offered by this prospectus may not be offered or sold, directly or indirectly, nor may this prospectus or any other offering material or advertisements in connection with the offer and sale of any such securities be distributed or published in any jurisdiction, except under circumstances that will result in compliance with the applicable rules and regulations of that jurisdiction. Persons into whose possession this prospectus comes are advised to inform themselves about and to observe any restrictions relating to the offering and the distribution of this prospectus. This prospectus does not constitute an offer to sell or a solicitation of an offer to buy any securities offered by this prospectus in any jurisdiction in which such an offer or a solicitation is unlawful.

Australia

This prospectus is not a disclosure document under Chapter 6D of the Australian Corporations Act, has not been lodged with the Australian Securities and Investments Commission and does not purport to include the information required of a disclosure document under Chapter 6D of the Australian Corporations Act. Accordingly, (i) the offer of the securities under this prospectus is only made to persons to whom it is lawful to offer the securities without disclosure under Chapter 6D of the Australian Corporations Act under one or more exemptions set out in section 708 of the Australian Corporations Act, (ii) this prospectus is made available in Australia only to those persons as set forth in clause (i) above, and (iii) the offeree must be sent a notice stating in substance that by accepting this offer, the offeree represents that the offeree is such a person as set forth in clause (i) above, and, unless permitted under the Australian Corporations Act, agrees not to sell or offer for sale within Australia any of the securities sold to the offeree within 12 months after its transfer for the offeree under this prospectus.

China

The information in this document does not constitute a public offer of the securities, whether by way of sale or subscription, in the People's Republic of China (excluding, for purposes of this paragraph, Hong Kong Special Administrative Region, Macau Special Administrative Region and Taiwan). The securities may not be offered or sold directly or indirectly in the PRC to legal or natural persons other than directly to "qualified domestic institutional investors."

European Economic Area—Belgium, Germany, Luxembourg and Netherlands

The information in this document has been prepared on the basis that all offers of securities will be made pursuant to an exemption under the Directive 2003/71/EC ("Prospectus Directive"), as implemented in Member States of the European Economic Area (each, a "Relevant Member State"), from the requirement to produce a prospectus for offers of securities.

An offer to the public of securities has not been made, and may not be made, in a Relevant Member State except pursuant to one of the following exemptions under the Prospectus Directive as implemented in that Relevant Member State:

(a) to legal entities that 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 that has two or more of (i) an average of at least 250 employees during its last fiscal year; (ii) a total balance sheet of more than €43,000,000 (as shown on its last annual unconsolidated or consolidated financial statements) and (iii) an annual net turnover of more than €50,000,000 (as shown on its last annual unconsolidated or consolidated financial statements);

(c) to fewer than 100 natural or legal persons (other than qualified investors within the meaning of Article 2(1)(e) of the Prospectus Directive) subject to obtaining the prior consent of the Company or any underwriter for any such offer; or

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

France

This document is not being distributed in the context of a public offering of financial securities (offre au public de titres financiers) in France within the meaning of Article L.411-1 of the French Monetary and Financial Code (Code monétaire et financier) and Articles 211-1 et seq. of the General Regulation of the French Autorité des marchés financiers ("AMF"). The securities have not been offered or sold and will not be offered or sold, directly or indirectly, to the public in France.

This document and any other offering material relating to the securities have not been, and will not be, submitted to the AMF for approval in France and, accordingly, may not be distributed or caused to distributed, directly or indirectly, to the public in France.

Such offers, sales and distributions have been and shall only be made in France to (i) qualified investors (investisseurs qualifiés) acting for their own account, as defined in and in accordance with Articles L.411-2-II-2° and D.411-1 to D.411-3, D.744-1, D.754-1 and D.764-1 of the French Monetary and Financial Code and any implementing regulation and/or (ii) a restricted number of non-qualified investors (cercle restreint d'investisseurs) acting for their own account, as defined in and in accordance with Articles L.411-2-II-2° and D.411-4, D.744-1, D.754-1 and D.764-1 of the French Monetary and Financial Code and any implementing regulation.

Pursuant to Article 211-3 of the General Regulation of the AMF, investors in France are informed that the securities cannot be distributed (directly or indirectly) to the public by the investors otherwise than in accordance with Articles L.411-1, L.411-2, L.412-1 and L.621-8 to L.621-8-3 of the French Monetary and Financial Code.

Ireland

The information in this document does not constitute a prospectus under any Irish laws or regulations and this document has not been filed with or approved by any Irish regulatory authority as the information has not been prepared in the context of a public offering of securities in Ireland within the meaning of the Irish Prospectus (Directive 2003/71/EC) Regulations 2005 (the "Prospectus Regulations"). The securities have not been offered or sold, and will not be offered, sold or delivered directly or indirectly in Ireland by way of a public offering, except to (i) qualified investors as defined in Regulation 2(l) of the Prospectus Regulations and (ii) fewer than 100 natural or legal persons who are not qualified investors.

Israel

The securities offered by this prospectus have not been approved or disapproved by the Israeli Securities Authority, or the ISA, nor have such securities been registered for sale in Israel. The shares may not be offered or sold, directly or indirectly, to the public in Israel, absent the publication of a prospectus. The ISA has not issued permits, approvals or licenses in connection with the offering or publishing the prospectus; nor has it authenticated the details included herein, confirmed their reliability or completeness, or rendered an opinion as to the quality of the securities being offered. Any resale in Israel, directly or indirectly, to the public of the securities offered by this prospectus is subject to restrictions on transferability and must be effected only in compliance with the Israeli securities laws and regulations.

Italy

The offering of the securities in the Republic of Italy has not been authorized by the Italian Securities and Exchange Commission (Commissione Nazionale per le Societ—$$—Aga e la Borsa, "CONSOB" pursuant to the Italian securities legislation and, accordingly, no offering material relating to the securities may be distributed in Italy and such securities may not be offered or sold in Italy in a public offer within the meaning of Article 1.1(t) of Legislative Decree No. 58 of 24 February 1998 ("Decree No. 58"), other than:

- to Italian qualified investors, as defined in Article 100 of Decree no. 58 by reference to Article 34-ter of CONSOB Regulation no. 11971 of 14 May 1999 ("Regulation no. 1197l") as amended ("Qualified Investors"); and
- in other circumstances that are exempt from the rules on public offer pursuant to Article 100 of Decree No. 58 and Article 34-ter of Regulation No. 11971 as amended.

Any offer, sale or delivery of the securities or distribution of any offer document relating to the securities in Italy (excluding placements where a Qualified Investor solicits an offer from the issuer) under the paragraphs above must be:

- made by investment firms, banks or financial intermediaries permitted to conduct such activities in Italy in accordance with Legislative Decree No. 385 of 1 September 1993 (as amended), Decree No. 58, CONSOB Regulation No. 16190 of 29 October 2007 and any other applicable laws; and

- in compliance with all relevant Italian securities, tax and exchange controls and any other applicable laws.

Any subsequent distribution of the securities in Italy must be made in compliance with the public offer and prospectus requirement rules provided under Decree No. 58 and the Regulation No. 11971 as amended, unless an exception from those rules applies. Failure to comply with such rules may result in the sale of such securities being declared null and void and in the liability of the entity transferring the securities for any damages suffered by the investors.

Japan

The securities have not been and will not be registered under Article 4, paragraph 1 of the Financial Instruments and Exchange Law of Japan (Law No. 25 of 1948), as amended (the "FIEL") pursuant to an exemption from the registration requirements applicable to a private placement of securities to Qualified Institutional Investors (as defined in and in accordance with Article 2, paragraph 3 of the FIEL and the regulations promulgated thereunder). Accordingly, the securities may not be offered or sold, directly or indirectly, in Japan or to, or for the benefit of, any resident of Japan other than Qualified Institutional Investors. Any Qualified Institutional Investor who acquires securities may not resell them to any person in Japan that is not a Qualified Institutional Investor, and acquisition by any such person of securities is conditional upon the execution of an agreement to that effect.

Portugal

This document is not being distributed in the context of a public offer of financial securities (oferta pública de valores mobiliários) in Portugal, within the meaning of Article 109 of the Portuguese Securities Code (Código dos Valores Mobiliários). The securities have not been offered or sold and will not be offered or sold, directly or indirectly, to the public in Portugal. This document and any other offering material relating to the securities have not been, and will not be, submitted to the Portuguese Securities Market Commission (Comissão do Mercado de Valores Mobiliários) for approval in Portugal and, accordingly, may not be distributed or caused to distributed, directly or indirectly, to the public in Portugal, other than under circumstances that are deemed not to qualify as a public offer under the Portuguese Securities Code. Such offers, sales and distributions of securities in Portugal are limited to persons who are "qualified investors" (as defined in the Portuguese Securities Code). Only such investors may receive this document and they may not distribute it or the information contained in it to any other person.

Sweden

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Switzerland

The securities may not be publicly offered in Switzerland and will not be listed on the SIX Swiss Exchange ("SIX") or on any other stock exchange or regulated trading facility in Switzerland. This document has been prepared without regard to the disclosure standards for issuance prospectuses under art. 652a or art. 1156 of the Swiss Code of Obligations or the disclosure standards for listing prospectuses under art. 27 ff. of the SIX Listing Rules or the listing rules of any other stock exchange or regulated trading facility in Switzerland. Neither this document nor any other offering material relating to the securities may be publicly distributed or otherwise made publicly available in Switzerland.

Neither this document nor any other offering material relating to the securities have been or will be filed with or approved by any Swiss regulatory authority. In particular, this document will not be filed with, and the offer of securities will not be supervised by, the Swiss Financial Market Supervisory Authority.

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United Arab Emirates

Neither this document nor the securities have been approved, disapproved or passed on in any way by the Central Bank of the United Arab Emirates or any other governmental authority in the United Arab Emirates, nor has the Company received authorization or licensing from the Central Bank of the United Arab Emirates or any other governmental authority in the United Arab Emirates to market or sell the securities within the United Arab Emirates.

This document does not constitute and may not be used for the purpose of an offer or invitation. No services relating to the securities, including the receipt of applications and/or the allotment or redemption of such shares, may be rendered within the United Arab Emirates by the Company.

No offer or invitation to subscribe for securities is valid or permitted in the Dubai International Financial Centre.

United Kingdom

Neither the information in this document nor any other document relating to the offer has been delivered for approval to the Financial Services Authority in the United Kingdom and no prospectus (within the meaning of section 85 of the Financial Services and Markets Act 2000, as amended ("FSMA")) has been published or is intended to be published in respect of the securities. This document is issued on a confidential basis to "qualified investors" (within the meaning of section 86(7) of FSMA) in the United Kingdom, and the securities may not be offered or sold in the United Kingdom by means of this document, any accompanying letter or any other document, except in circumstances which do not require the publication of a prospectus pursuant to section 86(1) FSMA.

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Any invitation or inducement to engage in investment activity (within the meaning of section 21 of FSMA) received in connection with the issue or sale of the securities has only been communicated or caused to be communicated and will only be communicated or caused to be communicated in the United Kingdom in circumstances in which section 21(1) of FSMA does not apply to us.

In the United Kingdom, this document is being distributed only to, and is directed at, persons (i) who have professional experience in matters relating to investments falling within Article 19(5) (investment professionals) of the Financial Services and Markets Act 2000 (Financial Promotions) Order 2005 ("FPO"), (ii) who fall within the categories of persons referred to in Article 49(2)(a) to (d) (high net worth companies, unincorporated associations, etc.) of the FPO or (iii) to whom it may otherwise be lawfully communicated (together "relevant persons"). The investments to which this document relates are available only to, and any invitation, offer or agreement to purchase will be engaged in only with, relevant persons. Any person who is not a relevant person should not act or rely on this document or any of its contents.

LEGAL MATTERS

The validity of the shares of common stock offered hereby will be passed upon for us by Gracin & Marlow, LLP, New York, New York. Certain legal matters in connection with this offering will be passed upon for the underwriters by Reed Smith LLP, New York, New York.

EXPERTS

The consolidated financial statements of Heat Biologics, Inc. and Subsidiaries (a development stage company) as of December 31, 2012 and 2011 and for each of the two years in the period ended December 31, 2012 and for the period June 10, 2008 (inception) through March 31, 2013 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 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 SEC a registration statement on Form S-1 under the Securities Act with respect to the shares of common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits and schedules filed therewith. For further information about us and the common stock offered hereby, reference is made to the registration statement and the exhibits and schedules filed therewith. Statements contained in this prospectus regarding the contents of any contract or any other document that is filed as an exhibit to the registration statement are not necessarily complete, and each such statement is qualified in all respects by reference to the full text of such contract or other document filed as an exhibit to the registration statement. A copy of the registration statement and the exhibits and schedules filed therewith may be inspected without charge at the public reference room maintained by the SEC, located at 100 F Street, N.E., Room 1580, Washington, D.C. 20549, and copies of all or any part of the registration statement may be obtained from such offices upon the payment of the fees prescribed by the SEC. Please call the SEC at 1-800-SEC-0330 for further information about the public reference room. The SEC also maintains an Internet web site that contains reports, proxy and information statements and other information regarding registrants that file electronically with the SEC. The address of the site is www.sec.gov.

Upon the consummation of this offering, we will file annual, quarterly and current reports, proxy statements and other information with the SEC under the Exchange Act. You can read our SEC filings, including the registration statement, at the SEC's website at www.sec.gov.

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 part of this prospectus.

INDEX TO FINANCIAL STATEMENTS

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Report of Independent Registered Public Accounting Firm

Board of Directors
Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)
Chapel Hill, North Carolina

We have audited the accompanying consolidated balance sheets of Heat Biologics, Inc. and Subsidiaries (the "Company") (a development stage company) as of December 31, 2012 and 2011 and the related consolidated statements of operations, stockholders' deficit, and cash flows for each of the two years in the period ended December 31, 2012 and for the period from June 10, 2008 (inception) to December 31, 2012. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. 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. and Subsidiaries at December 31, 2012 and 2011, and the results of its operations and its cash flows for each of the two years in the period ended December 31, 2012 and the period from June 10, 2008 (inception) to December 31, 2012**,** in conformity with accounting principles generally accepted in the United States of America.

/s/ BDO USA, LLP
Raleigh, North Carolina

April 8, 2013

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Consolidated Balance Sheets

	December 31, 2012	December 31, 2011	March 31, 2013 (unaudited)
Assets			
Current Assets			
Cash and cash equivalents	$ 5,030	$ 98,646	$ 4,889,723
Related party receivable	9,571	—	—
Stock subscription receivable	—	—	35,000
Miscellaneous receivable	—	—	13,009
Prepaid expenses and other current assets	58,436	5,593	165,234
Total Current Assets	73,037	104,239	5,102,966
Property and Equipment, net	10,782	11,589	9,968
Other Assets			
Restricted cash	26,214	1,712	26,215
Debt issuance costs, net	28,229	55,007	27,500
Deposits	9,320	9,520	9,320
Total Other Assets	63,763	66,239	63,035
Total Assets	$ 147,582	$ 182,067	$ 5,175,969
Liabilities and Stockholders' (Deficit) Equity			
Current Liabilities			
Accounts payable	$ 505,471	$ 352,125	$ 861,615
Accrued expenses and other payables	129,208	25,901	170,315
Accrued interest	13,763	686	32,641
Related party payables	—	12,371	—
Liabilities related to discontinued operations	—	55,652	—
Notes payable - current portion	66,806	—	308,472
Total Current Liabilities	715,248	446,735	1,373,043
Long Term Liabilities			
Related party payable	—	12,500	—
Notes payable - less current portion	658,194	—	616,528
Convertible notes payable	197,099	—	465,106
Preferred stock warrants liability	92,150	56,930	77,300
Total Liabilities	1,662,691	516,165	2,531,977
Commitments (Notes 8 and 12)			
Stockholders' (Deficit) Equity			
Series 1 preferred stock, $.0001 par value; 112,500 shares authorized, 112,500 shares issued and outstanding	11	11	11
Series A preferred stock, $.0001 par value; 2,000,000 shares authorized, 1,863,128, 1,347,255, and 1,863,128 shares issued and outstanding at December 31, 2012 and 2011 and March 31, 2013 (unaudited)	186	134	186
Series B-1 preferred stock, $.0001 par value; 4,100,000 shares authorized, 1,891,419 shares issued and outstanding at March 31, 2013 (unaudited)	—	—	189
Common stock, $.0002 par value; 50,000,000 shares authorized, 2,144,542, 2,121,715 and 2,144,542 shares issued and 1,858,971, 1,827,449 and 1,861,145 shares outstanding at December 31, 2012 and 2011 and March 31, 2013 (unaudited)	405	400	405
Additional paid in capital	4,495,832	3,205,753	9,443,205
Deficit accumulated during the development stage	(5,935,282)	(3,515,082)	(6,699,138)
Total Stockholders' (Deficit) Equity - Less Non-Controlling Interest	(1,438,848)	(308,784)	2,744,858
Non-Controlling Interest	(76,261)	(25,314)	(100,866)
Total Stockholders' (Deficit) Equity	(1,515,109)	(334,098)	2,643,992
Total Liabilities and Stockholders' (Deficit) Equity	$ 147,582	$ 182,067	$ 5,175,969

See accompanying notes to consolidated statements.

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Consolidated Statements of Operations

	Year Ended December 31,		Three Months Ended March 31,		June 10, 2008 (Inception) to March 31,
	2012	2011	2013	2012	2013
			(unaudited)		(unaudited)
Revenue					
Grant awards	$ 3,110	$ 187,787	$ —	$ —	$ 585,589
Operating Expenses					
Research and development	902,938	1,246,587	440,289	170,765	$ 3,797,771
Clinical and regulatory	253,189	255,210	62,057	46,807	489,900
General and administration	1,189,660	720,790	268,136	226,057	2,563,662
Total Operating Expenses	2,345,787	2,222,587	770,482	443,629	6,851,333
Loss from Operations	(2,342,677)	(2,034,800)	(770,482)	(443,629)	(6,265,744)
Nonoperating Income (Expenses)					
Interest income	2	517	1	—	688
Other (expense) income	(7,257)	(1,526)	10,362	(1,660)	1,579
Interest expense	(101,086)	(63,173)	(28,342)	(1,759)	(247,803)
Total Nonoperating Expenses	(108,341)	(64,182)	(17,979)	(3,419)	(245,536)
Loss from Continuing Operations	(2,451,018)	(2,098,982)	(788,461)	(447,048)	(6,511,280)
Loss from Discontinued Operations	(20,129)	(14,160)	—	(1,100)	(288,724)
Net Loss Before Income Tax Expense	(2,471,147)	(2,113,142)	(788,461)	(448,148)	(6,800,004)
Income Tax Expense	—	—	—	—	—
Net Loss	(2,471,147)	(2,113,142)	(788,461)	(448,148)	(6,800,004)
Less: net loss - non-controlling interest	(50,947)	(8,258)	(24,605)	(6,464)	(100,866)
Net Loss Attributable to Heat Biologics, Inc. and Subsidiaries	$ (2,420,200)	$ (2,104,884)	$ (763,856)	$ (441,684)	$ (6,699,138)
Basic and diluted loss per common share	$ (1.32)	$ (1.15)	$ (0.41)	$ (0.24)	
Basic and diluted weighted average common shares outstanding during the period	1,831,769	1,824,927	1,859,929	1,830,597	

See accompanying notes to consolidated statements.

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Consolidated Statements of Stockholders' (Deficit) Equity

	Preferred Stock Series 1 Amount	Preferred Stock Series A Amount	Preferred Stock Series B Amount	Common Stock Amount	Additional Paid In Capital	Deficit Accumulated During Development Stage	Non-Controlling Interest	Total Stockholders' (Deficit) Equity
Common Stock Issued:								
June 10, 2008, 1,395,559 shares	$ —	$ —	$ —	$ 321	$ —	$ —	$ —	$ 321
July 11, 2008, 260,870 shares	—	—	—	60	—	—	—	60
July 11, 2008, 184,048 shares	—	—	—	42	—	—	—	42
Non-cash consideration for rent	—	—	—	—	4,104	—	—	4,104
Net loss	—	—	—	—	—	(281,971)	—	(281,971)
Balance, December 31, 2008	—	—	—	423	4,104	(281,971)	—	(277,444)
Common Stock Issued:								
January 1, 2009, 60,871 shares	—	—	—	14	—	—	—	14
April 20, 2009, 21,835 shares	—	—	—	5	—	—	—	5
April 29, 2009, 98,626 shares	—	—	—	23	—	—	—	23
Common Stock Cancelled:								
June 26, 2009, (282,672) shares	—	—	—	(65)	65	—	—	—
Preferred Stock Issued:								
November 3, 2009, 112,500 shares at $2.22 per share	—	11	—	—	249,989	—	—	250,000
Non-cash consideration for rent	—	—	—	—	5,760	—	—	5,760
Stock based compensation	—	—	—	—	13,364	—	—	13,364
Net loss	—	—	—	—	—	(416,789)	(6,650)	(423,439)
Balance, December 31, 2009	—	11	—	400	273,282	(698,760)	(6,650)	(431,717)
Non-cash consideration for rent	—	—	—	—	5,760	—	—	5,760
Stock based compensation	—	—	—	—	30,791	—	—	30,791
Stock issuance costs	—	—	—	—	(7,584)	—	—	(7,584)
Net loss	—	—	—	—	—	(711,438)	(10,406)	(721,844)
Balance, December 31, 2010	—	11	—	400	302,249	(1,410,198)	(17,056)	(1,124,594)
Notes Payable Converted to Preferred Stock:								
September 30, 2011, 1,273,800 shares at $2.10 per share	—	127	—	—	2,674,853	—	—	2,674,980
Preferred Stock Issued:								
December 20, 2011, 73,455 shares at $2.10 per share	—	7	—	—	154,248	—	—	154,255
Preferred Series A Converted to Preferred Series 1, December 16, 2011, 112,500 shares at $2.22 per share	11	(11)	—	—	—	—	—	—
Stock based compensation	—	—	—	—	91,984	—	—	91,984
Stock issuance costs	—	—	—	—	(17,581)	—	—	(17,581)
Net loss	—	—	—	—	—	(2,104,884)	(8,258)	(2,113,142)
Balance, December 31, 2011	$ 11	$ 134	$ —	$ 400	$ 3,205,753	$ (3,515,082)	$ (25,314)	$ (334,098)

See accompanying notes to consolidated statements.

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Consolidated Statements of Stockholders' (Deficit) Equity (Continued)

	Preferred Stock Series 1 Amount	Preferred Stock Series A Amount	Preferred Stock Series B Amount	Common Stock Amount	Additional Paid In Capital	Deficit Accumulated During Development Stage	Non-Controlling Interest	Total Stockholders' (Deficit) Equity
Balance, December 31, 2011	$ 11	$ 134	$ —	$ 400	$ 3,205,753	$ (3,515,082)	$ (25,314)	$ (334,098)
Preferred Stock Issued:								
March 7, 2012, 47,619 shares at $2.10 per share	—	5	—	—	99,995	—	—	100,000
April 3, 2012, 39,683 shares at $2.10 per share	—	4	—	—	83,330	—	—	83,334
April 27, 2012, 428,571 shares at $2.10 per share	—	43	—	—	899,957	—	—	900,000
Common Stock Issued:								
December 27, 2012, 1,087 shares	—	—	—	—	825	—	—	825
December 31, 2012, 21,740 shares	—	—	—	5	10,495	—	—	10,500
Stock based compensation	—	—	—	—	217,896	—	—	217,896
Stock issuance costs	—	—	—	—	(22,419)	—	—	(22,419)
Net loss	—	—	—	—	—	(2,420,200)	(50,947)	(2,471,147)
Balance, December 31, 2012	11	186	—	405	4,495,832	(5,935,282)	(76,261)	(1,515,109)
Preferred Stock Issued:								
March 25, 2013, 1,891,419 shares at $2.67 per share (unaudited)	—	—	189	—	5,049,901	—	—	5,050,090
Stock based compensation (unaudited)	—	—	—	—	26,793	—	—	26,793
Stock issuance costs (unaudited)	—	—	—	—	(129,321)	—	—	(129,321)
Net loss (unaudited)	—	—	—	—	—	(763,856)	(24,605)	(788,461)
Balance, March 31, 2013 (unaudited)	$ 11	$ 186	$ 189	$ 405	$ 9,443,205	$ (6,699,138)	$ (100,866)	$ 2,643,992

See accompanying notes to consolidated statements.

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Consolidated Statements of Cash Flows

	Year Ended December 31,		Three Months Ended March 31,		June 10, 2008 (Inception) to March 31,
	2012	2011	2013	2012	2013
			(unaudited)		(unaudited)
Operating Activities					
Net loss	$ (2,471,147)	$ (2,113,142)	$ (788,461)	$ (448,148)	$ (6,800,004)
Adjustments to reconcile net loss to net cash used by operations:					
Depreciation	2,587	624	814	646	4,025
Amortization of debt issuance costs	58,458	26,168	729	—	99,242
Remeasurement of fair value of preferred stock warrants liability	3,540	1,040	(14,850)	—	(10,270)
Non-cash consideration for rent	—	—	—	—	15,624
Stock based compensation	217,896	91,984	26,793	16,828	380,828
Increase (decrease) in cash arising from changes in assets and liabilities:					
Grants receivable	—	223,295	—	—	—
Related party receivable	(9,571)	—	9,571	—	—
Stock subscription receivable	—	—	(35,000)	—	(35,000)
Other receivables	—	—	(13,009)	—	(13,009)
Prepaid expenses and other current assets	(52,843)	(1,898)	(106,798)	(1,169)	(165,234)
Restricted cash	(24,502)	(1,712)	(1)	1,100	(26,215)
Deposits	200	(9,520)	—	200	(9,320)
Accounts payable	85,323	74,495	356,144	6,232	861,615
Accrued expenses and other payables	103,307	22,776	41,107	(12,316)	170,315
Accrued interest	13,077	36,791	18,878	858	83,912
Net Cash Used in Operating Activities	(2,073,675)	(1,649,099)	(504,083)	(435,769)	(5,443,491)
Cash Flows from Investing Activities					
Purchase of property and equipment	(1,780)	(12,213)	—	(1,780)	(13,993)
Decrease in loan receivable from officer	—	6,138	—	—	—
Net Cash Used in Investing Activities	(1,780)	(6,075)	—	(1,780)	(13,993)
Financing Activities					
Related party payable	(12,500)	—	—	—	—
Borrowings on notes payable	1,147,099	—	200,000	225,000	1,150,000
Borrowings on line of credit	—	—	—	66,442	273,427
Payments on notes payable	(225,000)	—	—	—	(225,000)
Payments on line of credit	—	—	—	—	(273,427)
Issuance of convertible notes payable, net of issuance costs	—	1,447,709	268,007	—	3,049,643
Issuance of common stock	11,325	—	—	—	11,790
Issuance of series A preferred stock	1,083,334	154,255	—	99,389	1,487,589
Issuance of series B-1 preferred stock	—	—	5,050,090	—	5,050,090
Stock issuance costs	(22,419)	(17,581)	(129,321)	—	(176,905)
Net Cash Provided by Financing Activities	1,981,839	1,584,383	5,388,776	390,831	10,347,207
Net (Decrease) Increase in Cash and Cash Equivalents	(93,616)	(70,791)	4,884,693	(46,718)	4,889,723
Cash and Cash Equivalents - Beginning of Period	98,646	169,437	5,030	98,646	—
Cash and Cash Equivalents - End of Period	$ 5,030	$ 98,646	$ 4,889,723	$ 51,928	$ 4,889,723

See accompanying notes to consolidated statements.

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)

Consolidated Statements of Cash Flows (Continued)

	Year Ended December 31,		Three Months Ended March 31,		June 10, 2008 (Inception) to March 31,
	2012	2011	2013	2012	2013
			(unaudited)		(unaudited)
Supplemental Disclosure for Cash Flow Information					
Interest paid	$ 29,049	$ —	$ 5,593	$ —	$ 83,359
Supplemental Schedule of Noncash Investing and Financing Activities					
Notes payable converted to series A preferred stock	$ —	$ 2,674,980	$ —	$ —	$ 2,674,980
Issuance of preferred stock warrants and debt issuance costs	$ 31,680	$ 55,890	$ —	$ —	$ 119,250
Cancellation of common stock	$ —	$ —	$ —	$ —	$ 65
Non-cash consideration for rent	$ —	$ —	$ —	$ —	$ 15,624

See accompanying notes to consolidated statements.

1. Organization

Heat Biologics, Inc., ("Heat"), was incorporated in 2008 pursuant to the laws of the state of Delaware. Heat Biologics, Inc. is a development stage company focused on the development and commercialization of *ImPact* Therapy, a platform technology that offers a novel approach to treating cancer and other diseases by using live, modified cell lines to activate the immune system against specific defined targets. Heat is currently in Phase 2 clinical trials with its first drug for patients with advanced non-small cell lung cancer. During 2010 and part of 2011, Heat was based in Miami Beach, Florida. In July 2011, Heat moved all administrative operations to Chapel Hill, North Carolina.

Heat has owned 92.5% interests in two subsidiaries, Heat Biologics I, Inc. and Heat Biologics II, Inc. since their incorporation in the state of Delaware and commencement of operations on April 28, 2009. In April of 2012, the Board of Directors approved the sale of Heat's entire 92.5% interest in Heat II. An independent appraisal report, issued on April 18, 2012, was concurrently approved by the Board as an accurate assessment of Heat II's fair market value of $0.0025 per share. On June 25, 2012 a stock purchase agreement was executed for the purchase of 3,700,000 shares of Heat II common stock by a related party. The operations of Heat II through June 25, 2012, including fiscal year 2012 and 2011, and inception to date, are presented in the accompanying consolidated statements of operations as a loss from discontinued operations and on the consolidated balance sheets as liabilities related to discontinued operations.

On May 30, 2012, Heat formed two-wholly owned subsidiaries, Heat Biologics III, Inc. ("Heat III") and Heat Biologics, IV, Inc. ("Heat IV"). Heat also formed Heat Biologics GmbH (Heat GmbH), a wholly-owned limited liability company, organized in Germany on September 11, 2012. As of March 31, 2013, there had been no activity within Heat III, Heat IV, and Heat GmbH other than their formations.

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

Basis of Accounting

Heat prepares its consolidated financial statements on the accrual basis of accounting in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP"). Activities during the development stage include developing the business plan, raising capital, and developing the Company's platform technology.

Principles of Consolidation

The consolidated financial statements include the accounts of Heat Biologics, Inc. and its subsidiaries, Heat Biologics I, Inc. ("Heat I") and Heat Biologics II, Inc ("Heat II"), Heat Biologics III, Inc ("Heat III"), Heat Biologics IV, Inc. ("Heat IV") and Heat Biologics GmbH. All significant intercompany accounts and transactions have been eliminated in consolidation. At December 31, 2012 and 2011 and March 31, 2013 (unaudited), 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 interests as a component of stockholders' deficit on its consolidated balance sheets and reports non-controlling interest net income (loss) under the heading "net income (loss) – non-controlling interest" in the consolidated statements of operations. In June 2012, the Company sold its entire 92.5% interest in Heat II. The operations of Heat II through June 25, 2012, including fiscal year 2012 and 2011, and inception to date, are presented in the accompanying consolidated statements of operations as a loss from discontinued operations and on the consolidated balance sheets as liabilities related to discontinued 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 reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates.

Unaudited Interim Financial Information

The accompanying consolidated balance sheets as of March 31, 2013, consolidated statements of operations, consolidated cash flows and consolidated stockholders' (deficit) equity for the three months ended March 31, 2012 and 2013 and the cumulative period from inception (June 10, 2008) to March 31, 2013, are unaudited. The interim unaudited consolidated financial statements have been prepared on the same basis as the annual audited consolidated financial statements and, in the opinion of management, reflect all adjustments, which include only normal recurring adjustments, necessary for the fair statement of the Company's financial position as of March 31, 2013 and the results of its operations and its cash flows for the three months ended March 31, 2012 and 2013 and the cumulative period from inception (June 10, 2008) to March 31, 2013. The financial data and other information disclosed in these notes related to the three months ended March 31, 2012 and 2013 and the cumulative period from inception (June 10, 2008) to March 31, 2013 are unaudited. The results for the three months ended March 31, 2013 are not necessarily indicative of results to be expected for the year ending December 31, 2013, any other interim periods, or any future year or period.

Cash and Cash Equivalents and Restricted Cash

The Company considers all cash and other highly liquid investments with initial maturities of three months or less from the date of purchase to be cash and cash equivalents. The Company had a restricted cash balance of $26,214 and $1,712 at December 31, 2012 and 2011, respectively, and $26,215 at March 31, 2012 (unaudited). 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 requires a minimum $25,000 cash balance to be maintained with the lending bank.

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. All of the Company's cash balances were fully insured at December 31, 2012 and 2011. As of March 31, 2013, any cash balance above $250,000 is not fully insured. Uninsured cash balance at March 31, 2013 (unaudited) was $4,639,723. The Company believes it is not exposed to significant credit risk on cash and cash equivalents.

Debt Issuance Costs, net

Debt issuance costs include the costs incurred to obtain financing, including the fair value of preferred stock warrants at the date of issuance, and are amortized using the straight-line method, which approximates the effective interest method, over the life of the related debt. Debt issuance costs are included in the accompanying consolidated balance sheets net of amortization.

Property and Equipment

Property and equipment are stated at cost and are capitalized if the cost exceeds $500. Depreciation is calculated using the straight-line method and is based on estimated useful lives of 3 years for computer equipment and seven years for furniture and fixtures.

Preferred Stock Warrant Liability

In December 2011 and August 2012, the Company entered into a promissory note with each of two lenders and issued preferred stock warrants to each lender as consideration. The Company accounts for these freestanding warrants to purchase the Company's Series A Preferred Stock as liabilities at fair value on the accompanying consolidated balance sheets. The warrants may only be settled in shares of Series A Preferred Stock. The warrants are subject to re-measurement at each balance sheet date, and the change in fair value, if any, is recognized as other income (expense). The Company will continue to adjust the liability for changes in fair value until the earlier of (i) exercise of the warrants, (ii) conversion of the warrants into warrants to purchase common stock upon an event such as the completion of an initial public offering or (iii) expiration of the warrants. Upon conversion, the preferred stock warrant liability will be reclassified into additional paid-in capital. The Monte Carlo simulation is a generally accepted statistical method used to generate a defined number of stock price paths in order to develop a reasonable estimate of the range of the Company's future expected stock prices and minimizes standard error.

Significant assumptions used in the valuation of the warrants were as follows:

	March 31, 2013	December 31,	
		2012	2011
	(Unaudited)		
Exercise price	$4.83	$4.83	$4.83
Risk-free interest rate	1.56% – 1.87%	1.78%	1.65% – 1.92%
Expected volatility	76.2 – 76.3%	75.6 – 76.3%	75.1 – 76.7%
Expected life (years)	10	10	10
Expected dividend yield	0%	0%	0%

Net Loss per Share

Basic net loss per share is computed by dividing net income 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 prepaid expenses and other current assets, other assets, deposits, accounts payable, accrued expenses and other payables, and related party payable approximate fair value due to their short maturities. The carrying value of the Company's notes payable approximated fair value because the interest rates under those obligations approximate 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's financial instruments that are measured at fair value on a recurring basis consist only of the preferred stock warrant liability. The Company's preferred stock warrant liability is classified within Level III of the fair value hierarchy.

The change in the fair value of the Level III preferred stock warrant liability is summarized below:

	December 31,		March 31,	
	2012	2011	2013	2012
			(unaudited)	
Fair value at beginning of period	$ 56,930	$ —	$ 92,150	$ 56,930
Issuances	31,680	55,890	—	—
Change in fair value at end of period	3,540	1,040	(14,850)	—
Fair value at end of period	$ 92,150	$ 56,930	$ 77,300	$ 56,930

Marketing

Marketing costs are expensed as incurred. Marketing expense totaled $5,921 and $18,380 for the years ended December 31, 2012 and 2011, respectively. Marketing expense totaled $1,600 and $4,200 for the three months ended March 31, 2013 and 2012 (unaudited), 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 financial statements 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, 2012 and 2011 and March 31, 2013 (unaudited), 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 income. As of December 31, 2012 and 2011 and March 31, 2013 (unaudited), 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 option-pricing model on the date of grant for stock options and 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, 2012 and 2011 the three month ended March 31, 2013 and 2012 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 over 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's ownership in Heat I, and its ownership of in Heat II before the divestiture of Heat II.

Revenue Recognition

The Company recognizes government grants when there is reasonable assurance that they will comply with the conditions attached to the grants and that 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 legal 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.

Recent Accounting Pronouncements

In May 2011, the Financial Accounting Standards Board (“FASB”) amended the FASB Accounting Standards Codification (“ASC”) to converge the fair value measurement guidance in U.S. GAAP and International Financial Reporting Standards. Some of the amendments clarify the application of existing fair value measurement requirements, while other amendments change particular principles in fair value measurement guidance. In addition, the amendments require additional fair value disclosures. The amendments are effective for fiscal years beginning after December 15, 2011 and should be applied prospectively. These amendments impact the Company’s financial statement disclosures only and became effective in 2012. The amendments did not have a material impact on the Company’s consolidated financial statements.

In August 2012, the Financial Accounting Standards Board ("FASB") issued ASU 2012-03,*Technical Amendments and Corrections* to SEC Sections to amend various SEC sections in the Accounting Standards Codification as a result of (1) the issuance of SEC Staff Accounting Bulletin No. 114; (2) the issuance of SEC Release No. 33-9250; and (3) corrections related to ASU 2010-22, *Technical Corrections to SEC Paragraphs.* The new guidance was effective upon issuance, and the adoption of this guidance did not have an impact on the Company's consolidated financial statements.

In October 2012, the FASB issued ASU 2012-04 –*Technical Corrections and Improvements*. The amendments in this Update cover a wide range of topics within the codification, as they incorporate multiple improvements provided through the codification's feedback process. Amendments have been made to source literature, guidance clarification, reference corrections and relocations of guidance. Amendments that do not have transition guidance were effective upon issuance. Amendments subject to transition guidance will be effective for fiscal periods beginning after December 15, 2012. The Company adopted the guidance effective January 1, 2013 and the adoption of this guidance did not have an impact on the Company's consolidated financial statements.

3. Discontinued Operations

In April of 2012, the Company's board approved a plan to sell its 92.5% interest in Heat II to a related party entity. On June 25, 2012, the Company sold all of its interest to the related party in exchange for $9,250 in cash and a receivable from the related party of $296,244. The receivable is due in full approximately seven years from the date of the transaction with interest accruing at a rate of 6% per annum. The Company performed a fair value analysis of the receivable from the related party and determined that due to the uncertainty surrounding the collectibility of the receivable, the fair value was $0. The Company's estimate of the fair value of the receivable is based upon several factors including the long-term maturity of the receivable, an analysis of the related party's ability and willingness to pay the receivable given the current financial position, and that fact that Heat II is likely years away from generating product revenues.

The $9,250 in cash was recorded as a reduction to the loss from discontinued operations in the consolidated statement of operations for the year ended December 31, 2012. The operations of Heat II through June 25, 2012, including fiscal years 2012 and 2011, and inception to date, are presented in the accompanying consolidated statements of operations as a loss from discontinued operations and on the consolidated balance sheets as liabilities related to discontinued operations.

4. Property and Equipment

Property and equipment consist of the following at:

	Year ended December 31,		Three months ended March 31,
	2012	2011	2013
			(unaudited)
Computer equipment	$ 3,213	$ 3,213	$ 3,213
Furniture and fixtures	10,780	9,000	10,780
Less: accumulated deprecation	(3,211)	(624)	(4,025)
	$ 10,782	$ 11,589	$ 9,968

Depreciation expense for the years ended December 31, 2012 and 2011 was $2,587 and $624, respectively. Depreciation expense for the three months ended March 31, 2013 and 2012 (unaudited) was $814 and $646, respectively.

5. Debt Issuance Costs

In connection with the issuance of convertible notes payable, the Company incurred debt acquisition costs in the amount of $39,172. The Company capitalized these costs and amortized them over the life of the note payable, using the straight-line method of amortization. The outstanding notes payable were all converted to preferred stock during the year-ended December 31, 2011 at which time the remaining debt issuance costs related to the issuance of these convertible notes payable were written-off.

In December 2011, the Company recorded $55,890 of debt issuance costs related to the issuance of warrants to purchase Series A Preferred Stock to a lender. The warrants were issued in conjunction with a promissory note issued to the lender. In December 2011, the Company began amortizing the debt issuance costs over the three year term of the promissory note resulting in $883 of interest expense for the year ended December 31, 2011. The note payable associated with the preferred stock warrants was paid in full and terminated during 2012. The remaining balance of $55,007 was amortized and written off during 2012.

In August 2012, the Company recorded $31,680 of debt issuance costs related to the issuance of warrants to purchase Series A Preferred Stock to a lender. The warrants were issued in conjunction with a promissory note issued to the lender. At this time, the Company began amortizing the debt issuance costs over the four year term of the promissory note resulting in interest expense of $3,451 the year ended December 31, 2012. Unaudited interest expense for the three month period ended March 31, 2013 was $729 related to the amortization of these debt issuance costs.

Total amortization expense for the debt issuance costs was $58,548 and $26,168 during fiscal year 2012 and 2011, respectively. Unaudited amortization expense was $729 for the three month period ended March 31, 2013. Accumulated amortization at December 31, 2012 and 2011 was $3,451 and $39,172, respectively. Unaudited accumulated amortization at March 31, 2013 and 2012 was $4,180 related to the amortization of these debt issuance costs.

6. Convertible Notes Payable

On May 18, 2010, the Company issued a convertible note payable to an investor in the amount of $250,000 with an interest rate of 3% per annum, accruing monthly. The note is convertible into the Company's Series A Preferred Stock at a price per share of $2.10. The note was scheduled to mature in November 2011; however, the note payable, along with accrued interest of $10,273, was converted to Series A Preferred Stock on September 30, 2011. The conversion resulted in 123,939 shares of preferred stock issued and $260,260 of additional paid-in capital.

On May 24, 2010, the Company issued a convertible note payable to a related party in the amount of $350,000 with an interest rate of 3% per annum, accruing monthly. The note is convertible into the Company's Series A Preferred Stock at a price per share of $2.10. The note was scheduled to mature in November 2011; however, the note payable, along with accrued interest of $14,210, was converted to Series A Preferred Stock on September 30, 2011. The conversion resulted in 173,433 shares of preferred stock issued and $364,192 of additional paid-in capital.

On September 30, 2010, the Company issued a convertible note payable to a related party in the amount of $576,000 with an interest rate of 3% per annum, accruing monthly. The note is convertible into the Company's Series A Preferred Stock at a price per share of $2.10. The note was scheduled to mature in March 2012; however, the note payable, along with the accrued interest of $17,279, was converted to Series A Preferred Stock on September 30, 2011. The conversion resulted in 282,514 shares of preferred stock issued and $593,252 of additional paid-in capital.

On May 9, 2011, the Company issued a convertible note payable to a related party in the amount of $425,000 with an interest rate of 3% per annum, accruing monthly. The note is convertible into the Company's Series A Preferred Stock at a price per share of $2.10. The note was scheduled to mature in November 2012; however, the note payable, along with the accrued interest of $5,029, was converted to Series A Preferred Stock on September 30, 2011. The conversion resulted in 204,776 shares of preferred stock issued and $430,009 of additional paid-in capital.

On June 1, 2011, the Company issued a convertible note payable to a related party in the amount of $100,000 with an interest rate of 3% per annum, accruing monthly. The note is convertible into the Company's Series A Preferred Stock at a price per share of $2.10. The note was scheduled to mature in December 2012; however, the note payable, along with accrued interest of $993, was converted to Series A Preferred Stock on September 30, 2011. The conversion resulted in 48,092 shares of preferred stock issued and $100,988 of additional paid-in capital.

On August 15, 2011, the Company issued a convertible note payable to a related party in the amount of $922,709 with an interest rate of 3% per annum, accruing monthly. The note is convertible into the Company's Series A Preferred Stock at a price per share of $2.10. The note was scheduled to mature in February 2013; however, the note payable, along with accrued interest of $3,487, was converted to Series A Preferred Stock on September 30, 2011. The conversion resulted in 441,046 shares of preferred stock issued and $926,152 of additional paid-in capital.

On October 20, 2011, the Company entered into a convertible note agreement with a vendor for an amount up to $950,000. The note accrues 12% simple interest per annum beginning on the day of the first advance. The note is convertible into common or Series A preferred stock at the latest valuation. The type of security converted will depend on whether common or Series A preferred stock is issued as part of a successful future equity raise of at least $7.5 million at the qualified offering price. Unless earlier converted into equity, the note will be payable upon demand after the eighth anniversary of the execution date of the vendor agreement which occurs in October 2019. The agreement allows the vendor to treat unpaid invoices as advances of principal under the promissory note. As of December 31, 2012 and 2011, the Company had drawn $197,099 and $0, respectively, on this note agreement. As of March 31, 2013 (unaudited), the Company had drawn $465,106 on this note agreement. The note matures on October 20, 2019 unless the agreement is terminated earlier or the note is converted to Series A preferred stock or common stock.

Accrued interest on outstanding debt obligations was $13,763 and $686 at December 31, 2012 and 2011, respectively. Unaudited accrued interest at March 31, 2013 was $32,641.

7. Notes Payable

On December 14, 2011, the Company entered into a loan agreement with the North Carolina Biotechnology Center (the "Center") for an amount up to $250,000 to be used by the Company to develop certain of its proprietary technology and processes as defined by the loan agreement during a one year period ended December 14, 2012. The principal of the loan, plus accrued interest, is due in full on December 14, 2014, with annual installments of 5% of the outstanding balance due on December 14, 2012 and 2013. The loan agreement accrues interest at 4.25% per annum beginning on the day of the first advance. As of December 31, 2011, the outstanding balance was $0 and no draw downs occurred during fiscal year 2011. During the year ended December 31, 2012, the Company drew down $225,000 of the loan and then repaid the principal balance, including accrued interest, in full in August 2012. The loan agreement was canceled upon the repayment.

In conjunction with this loan agreement, the Company issued warrants to purchase 29,762 shares of Series A Preferred Stock with an exercise price of $4.83 per share and an expiration date of December 13, 2021. Per the terms of the warrant agreement, the exercise price of $4.83 per share is subject to adjustment if at any time subsequent to the date of the warrant agreement, Preferred Series A shares are issued at a price less than $4.83 per share. The warrants were recorded at fair value as a liability on the Company's consolidated balance sheet on the date of issuance and are revalued as of each balance sheet date. (See Note 9 Preferred Stock Warrants Liability).

On August 7, 2012, the Company and Heat I entered into a loan and security agreement ("the Loan and Security Agreement") with a bank. The terms of the agreement provide for a $1,000,000 term loan ("Tranche A") to be available to the Company and Heat I as of the date of the Loan and Security Agreement. The Tranche A term loan may be increased to $2,775,000 upon the Company receiving grant funding totaling at least $16,000,000. The Tranche A term loan accrues interest monthly at an interest rate of 3% plus Prime or 6% per annum, whichever is greater. The Tranche A term loan principal balance, along with any accrued interest, is to be paid in thirty-six equal monthly installments beginning September 7, 2013 and ending August 7, 2016. As of December 31, 2012, the Company's outstanding principal balance on the Tranche A term loan was $500,000. As of March 31, 2013 (unaudited), the outstanding principal balance on the Tranche A term loan was $500,000.

The Loan and Security Agreement provides for another term loan of $1,000,000 ("Tranche B") upon the receipt of at least $5,000,000 from the sale or issuance of the Company's equity securities to investors on or before December 15, 2012 ("Tranche B Equity Trigger Event"). The Tranche B term loan accrues interest monthly at an interest rate of 3% plus Prime or 6% per annum, whichever is greater. The Tranche B term loan principal balance, along with any accrued interest, is to be paid in equal monthly installments beginning on the 7th day of the month immediately following the 12 month period after the Tranche B Equity Trigger Event and ending August 7, 2016. As of March 31, 2013 (unaudited), the Company has not drawn on the Tranche B term loan.

Additionally, the Loan and Security Agreement provides for a term loan in an aggregate principal amount not to exceed $225,000 ("Term Loan B"). Payments of 5% of the outstanding principal balance, plus accrued interest are each due on August 2013 and 2014, with the remaining principal balance, plus all accrued interest, due December 14, 2014. The term loan accrues interest monthly at 4.25% per annum. Proceeds from the $225,000 Term Loan B were used to pay in full the principal balance of the loan with the Center as noted above. As of December 31, 2012, the Company's outstanding principal balance on the Term Loan B was $225,000. As of March 31, 2013, the unaudited outstanding principal balance on the Term Loan B was $225,000. At December 31, 2012, the Company was not in compliance with certain financial covenants related to this debt agreement. On March 31, 2013, the Company achieved the Equity Milestone covenant requirement which required the Company to obtain $4,500,000 in equity financing by March 31, 2013. As of March 31, 2013 (unaudited), the Company was in compliance with its financial covenants related to this debt agreement.

On January 10, 2013, the Company signed a Second Amendment to its Loan and Security Agreement which granted an extension of credit in the form of a Non-Formula Revolving Line ("the Non-Formula Line") for an amount up to $200,000. This increase in credit was through a limited guaranty by an investor who secured the additional obligation by maintaining as collateral a money market account of a minimum of $200,000 with the bank. This guarantee was only for the amounts arising from the Line. It was the intention of both the investor and the Company that the Line was to be repaid within a reasonable time period after the successful raise of capital but no later than January 9, 2014, the maturity date of the Line. The payoff of the Line would release the investor of its obligation to the bank. The outstanding balance on the Non-Formula Line was $200,000 as of March 31, 2013 (unaudited).

In conjunction with the Loan and Security Agreement, the Company issued the bank warrants to purchase 17,500 shares of Heat's Series A Preferred Stock. The warrants were issued on August 7, 2012 with an initial exercise price of $4.83 per share and expire on August 7, 2022. The warrants were recorded at fair value as a liability on the Company's consolidated balance sheet on the date of issuance and are revalued as of each balance sheet date. (See Note 9 Preferred Stock Warrants Liability).

As of March 31, 2013 (unaudited), future payments under the Company's notes payable agreements are:

2013	$ 308,472
2014	380,417
2015	166,667
2016	69,444
Total	$ 925,000

8. License Agreements

On July 11, 2008, Heat entered into two agreements with a research university (the "University") to license, from the University, certain technology and processes in various stages of patent pursuit on an exclusive basis for use in its research and development and commercial activities ("License Agreement 03-31, 05-39" and "License Agreement 97-14", or collectively "License Agreements"). Heat has the right to grant sublicenses under the License Agreements.

Heat is also responsible for all patent costs, past and future, associated with the preparation, filing, prosecution, issuance, and maintenance of United States patent applications. Heat is also required to make minimum royalty payments to the University under the terms of the License Agreements.

In connection with the License Agreements, Heat agreed to issue to the University 10% of all issued and outstanding common stock in each class and series on a fully-diluted basis together with rights to participate in future stock offerings.

In April 2009, Heat and the University agreed to amend the original License Agreements of July 11, 2008 to extend the terms of payments. For the additional consideration of $12,500 and additional stock of 2.5% of fully-dilutable shares issued and outstanding for each License Agreement, a revised extension date of August 11, 2009 was granted for all past due license fees and patent costs. Furthermore, the 10% original stock holdings were given assurance of anti-dilution protection until a "Qualified Investment" pursuant to this agreement. This anti-dilution protection has been distinguished with the subsequent agreement described below.

On June 26, 2009, Heat assigned all rights and obligations of License Agreement 03-31, 05-39 and License Agreement 97-14 to its subsidiaries, Heat II and Heat I, respectively. All previous stock ownership and rights of the University to participate in future stock offerings by Heat were mutually terminated. Heat I and Heat II agreed to issue the University 5% of each subsidiary's issued and outstanding common stock in each class and series on a fully-diluted basis, together with fully-dilutable common shares equal to 2.5% of the total number of shares in each class and series issued outstanding. As a result, the University owns 7.5% of Heat I and Heat II's issued and outstanding common stock. For each agreement, the Company agreed to make minimum royalty payments of $10,000 for three years beginning 2010 due on the anniversary date of the agreements. Beginning in 2013, and thereafter for the life of the agreements, the minimum royalty payments shall be $20,000 due on the same date. A milestone payment is due to the University from the Company no later than May 2017 of $250,000 for License Agreement 97-14.

In August 2009, Heat II and the University entered into a second amendment ("Amendment 2") to License Agreement 03-31, 05-39 to extend the foregoing payment due dates for all past due license fees and patent costs.

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.

In February 2010, Heat II and the University entered into a third amendment ("Amendment 4") to License Agreement 03-31, 05-39 to grant back to the University a certain non-exclusive license. In all other respects, the original agreement remained the same.

On August 30, 2010, Heat entered into an option agreement with another research university ("University II") to acquire the right to negotiate an exclusive license for certain materials which includes cancer bladder 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. Heat paid an option fee of $2,000, a license issue fee of $10,000 and is 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, the Company is 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 $250,000,000 or more. To date, the Company has paid $22,000 to University II with respect to such license. The license agreements provide that the University II has the right to terminate the license should Heat cease to carry on its business, fail to make a required payment or otherwise materially breach or default in its obligations under the license agreement following the giving of notice and an opportunity to cure any such breach. The license agreement provides that if the Company does not achieve the following milestones within the required period, University II 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 University II on or before January 1, 2020.

In October 2010, Heat II and the University entered into a fourth amendment ("Amendment 5") to License Agreement 03-31, 05-39 to grant to the licensor a non-exclusive license right for certain technology as research reagents and research tools.

On December 12, 2010, Heat II entered into a similar license agreement ("I-176") with the University for one component of complimentary technology to the July 11, 2008 agreement. Heat II agreed to pay the University a license fee of $50,000 and a reimbursement of $15,797 for past patent fees. Heat II also agreed to make a minimum royalty payment of $10,000 during 2012.

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 the license, 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 the license, 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 the license, 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.

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, the license agreement provides for an evaluation term of twelve months subject to two additional renewals, and a non-exclusive commercial use license upon termination of the evaluation period to utilize the products the Company obtains in the evaluation to develop, make, use and sell licensed products. The license agreement has a term of forty years. Heat paid an evaluation fee and 2 renewal evaluation fees totaling $15,000, and is 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, Heat is obligated to make milestone payments of $15,000, $30,000 and $60,000 upon initiation of a Phase I, Phase II, and Phase III trial, respectively; and $200,000 upon receipt of marketing authorization. To date, the Company has paid $15,000 to the not-for-profit corporation with respect to such license.

At December 31, 2011, Heat owed the University approximately $160,000 in unpaid license fees. At December 19, 2012, Heat owed the University approximately $102,784 in unpaid license fees. Heat entered into a payment agreement on December 19, 2012 to extend the payment due of Heat I obligations until the earlier of the closing of a Series B financing round or June 1, 2013. As consideration for the extension of payment Heat I shall make an additional payment to the University equal to 18% annual interest of the outstanding balance on or before the due date or at the University's option convert into shares of preferred stock according to the terms stipulated in the agreement.

Future minimum royalty payments that are required to be paid with the passage of time through December 31, 2022 are as follows:

Year ended December 31,	
2013	$ 30,000
2014	30,000
2015	30,000
2016	30,000
2017	280,000
Thereafter through 2022	150,000
Total	$ 550,000

These payments do not include payments that are contingent upon the Company meeting certain criteria or milestones or certain events occurring.

9. Preferred Stock Warrants Liability

The summary of warrant activity for the years ended December 31, 2012 and 2011 and three months ended March 31, 2013 is as follows:

	Number of Warrants	Weighted Average Exercise Price	Weighted Average Remaining Contractual Life (in years)	Weighted Average Grant Date Fair Value
Outstanding at January 1, 2011	—	$ —	—	—
Granted	29,762	4.83	9.9	$ 1.88
Exercised	—	—	—	—
Expired/cancelled	—	—	—	—
Outstanding at December 31, 2011	29,762	$ 4.83	9.9	$ 1.91
Granted	17,500	$ 4.83	9.9	$ 1.81
Exercised	—	—	—	—
Expired/cancelled	—	—	—	—
Outstanding at December 31, 2012	47,262	$ 4.83	9.4	$ 1.78
Granted, (unaudited)	—	—	—	—
Exercised, (unaudited)	—	—	—	—
Expired/cancelled, (unaudited)	—	—	—	—
Outstanding at March 31, 2013, (unaudited)	47,262	$ 4.83	8.9	$ 1.64

The aggregate intrinsic value of the preferred stock warrants in the table above is $0.00 at December 31, 2012, December 31, 2011, and March 31, 2013 (unaudited). The aggregate intrinsic value is before applicable income taxes and is calculated based on the difference between the exercise price of the warrants and the estimated fair market value of the Company's Series A Preferred Stock as of the respective dates.

10. Stockholders' (Deficit) Equity

Authorized Capital

Heat has authorized 2,112,500 shares of preferred stock (par value $0.0001) as of December 31, 2012 and 2011. Of the 2,112,500 preferred stock shares authorized, 2,000,000 are designated as Series A and 112,500 as Series 1. Of the Series A Preferred Stock, 1,863,128 and 112,500 and 1,347,255 and 112,500 are issued and outstanding as of December 31, 2012 and 2011, respectively and 1,863,128 and 112,500 are issued and outstanding as of March 31, 2013 (unaudited). In April 2011, an amended and restated Certificate of Incorporation was filed, and Heat reclassified and substituted 112,500 Series A preferred shares for Series 1 preferred shares. All of the original rights and preferences of the Series A were transferred to the Series 1 preferred stock. Of the Series 1 preferred stock, 112,500 are issued and outstanding as of December 31, 2012 and 2011 and March 31, 2013 (unaudited). In March 2013, an amended and restated Certificate of Incorporation was filed which authorized 8,212,500 shares of preferred stock which is designated as 2,000,000 shares of Series A, 112,500 shares of Series 1, 4,100,000 shares of Series B-1, and 2,000,000 shares of Series B-2. As of March 31, 2013 (unaudited), the Company had 1,891,419 and 0 shares of Series B-1 and Series B-2 Preferred Stock issued and outstanding, respectively. As of March 31, 2013, the Company recorded a receivable of $35,000, which represents the amount owed by a shareholder with respect to the purchase of the Series B-1 Preferred Stock. This amount has subsequently been paid to the Company by the shareholder.

Heat authorized 50,000,000 shares of common stock (par value $0.0002) as of December 31, 2012 and 2011 and March 31, 2013 (unaudited). Of the 50,000,000 common stock shares, 2,144,542 and 2,121,715 were issued and 1,858,971 and 1,827,449 were outstanding as December 31, 2012 and 2011, respectively. Of the 50,000,000 common stock shares, 2,144,542 and 1,861,145 are issued and outstanding, respectively, as of March 31, 2013 (unaudited).

Preferred Stock

Series 1, 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; (iii) with respect to the Series 1 Preferred Stock, if 2/3 of the Series 1 Preferred Stock holders vote in favor of a conversion then the Series 1 will automatically convert to common stock; and (iv) 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.

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, 1 and B Preferred Stock the dividends that would have been declared with respect to common stock issuable upon conversion of the Series A, 1 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 and pari passu with the holders of the Series 1 Preferred Stock 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 and pari passu with the holders of the Series 1 Preferred Stock an amount per share equal to $4.83 plus any dividends declared but unpaid. In the event of a liquidation, the holders of the Series 1 Preferred Stock are entitled to receive before any payment to the common stock holder and pari passu with any distribution to the Series A Preferred Stock an amount per share equal to $5.41 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.

Non-cash Consideration for Rent

Non-cash consideration for rent represents office space and other utilities provided by an unrelated entity on behalf of the Company during the years ended December 31, 2008 through December 31, 2010. No cash was transferred for the utilization of the space. The fair market value of the non-cash consideration was calculated using market rental rates and the square footage of office space provided.

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. As of December 31, 2012 and 2011, there were 590,047 and 471,905 stock options outstanding under the 2009 Plan, respectively. As of March 31, 2013 (unaudited), there were 590,047 stock options outstanding under the 2009 Plan.

The following table summarizes the components of the Company's stock-based compensation included in net loss:

	Year ended December 31,		Three months ended March 31,	
	2012	2011	2013	2012
			(unaudited)	
Employee stock options	$ 60,956	$ 51,686	$ 7,777	$ 6,106
Non-employee stock options	128,157	11,324	13,216	9,322
Restricted stock awards	28,783	16,540	5,800	1,400
	$ 217,896	$ 79,550	$ 26,793	$ 16,828

Stock Options

The fair market value of the stock options at the date of grant and re-measurement date was estimated using the Black-Scholes option-pricing model with the following assumptions:

	Year ended December 31,		Three months ended March 31, (unaudited)	
	2012	2011	2013	2012
Risk-free interest rate	0.72 – 0.97%	0.71 – 1.16%	0.76 – 0.88%	0.91 – 1.40%
Expected volatility	80-90%	70%	90%	70%
Expected life (years)	5.0 – 6.25	3.5 – 6.25	4.7 – 5.75	3.5 – 6.25
Expected dividend yield	0%	0%	0%	0%

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 did not have any 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 value stock option grants. 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 stock compensation expense of $217,896 and $79,550 for the years ended December 31, 2012 and 2011, respectively for the Company's stock option awards. The Company recognized stock compensation expense of $26,793 and $16,828 for the three month periods ended March 31, 2013 and 2012 (unaudited), respectively, for the Company's stock option awards.

The following tables summarize the stock option activity as of December 31, 2012 and 2011 and March 31, 2013 (unaudited):

	Shares	Weighted Average Exercise Price
Options at January 1, 2011	143,580	$ 0.58
Granted	334,031	0.67
Exercised	—	—
Expired/cancelled	(5,706)	0.64
Options at December 31, 2011	471,905	$ 0.64
Granted	178,742	0.76
Exercised	(22,827)	0.51
Expired/cancelled	(37,773)	0.02
Options at December 31, 2012	590,047	$ 0.71
Granted, (unaudited)	—	—
Exercised, (unaudited)	—	—
Expired/cancelled, (unaudited)	—	—
Options at March 31, 2013, (unaudited)	590,047	$ 0.71

The weighted average grant date fair value of stock options granted during the years ended December 31, 2012 and 2011 was $1.31 and $0.37, respectively. There were no stock options granted during the three months ended March 31, 2013 (unaudited).

The following table summarizes information about stock options outstanding at December 31, 2012:

Options Outstanding			Options Exercisable		
Balance as of December 31, 2012	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price	Balance as of December 31, 2012	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price
590,047	8.34	$0.74	431,951	8.70	$0.64

As of December 31, 2012, the unrecognized stock-based compensation expense related to unvested stock options was approximately $153,126, which is expected to be recognized over a weighted average period of approximately 34 months.

The aggregate intrinsic value of stock options outstanding and exercisable at December 31, 2012 was approximately $890,000 and $690,000, respectively. This amount is before applicable income taxes and represents the market price of the Company's common stock at December 31, 2012 less the grant price, multiplied by the number of stock options that had a grant price that is less than the market price. This amount represents the amount that would have been received by the optionees had these stock options been exercised on that date. During the year ended December 31, 2012, the aggregate intrinsic value of stock options exercised was $39,600.

The following table summarizes information about stock options outstanding at March 31, 2013 (unaudited):

Options Outstanding			Options Exercisable		
Balance as of March 31, 2013	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price	Balance as of March 31, 2013	Weighted Average Remaining Contractual Life (Years)	Weighted Average Exercise Price
590,047	8.09	$0.71	454,435	7.87	$0.74

As of March 31, 2013 (unaudited), the unrecognized stock-based compensation expense related to unvested stock options was approximately $146,000 which is expected to be recognized over a weighted average period of approximately 20 months.

The aggregate intrinsic value of stock options outstanding and exercisable at March 31, 2013 (unaudited) was approximately $1.3 million and $1.1 million, respectively. This amount is before applicable income taxes and represents the market price of the Company's common stock at March 31, 2013 less the grant price, multiplied by the number of stock options that had a grant price that is less than the market price. This amount represents the amount that would have been received by the optionees had these stock options been exercised on that date. During the year ended March 31, 2013 (unaudited), the aggregate intrinsic value of stock options exercised was zero.

A summary of the activity of the Company's unvested stock options is as follows:

	Options	Weighted Average Grant Date Fair Value
Balance at January 1, 2011	93,343	$ 0.37
Granted	334,031	0.37
Vested	(173,229)	0.37
Forfeited	(5,706)	0.41
Balance at December 31, 2011	248,439	$ 0.39
Granted	178,742	1.31
Vested	(257,510)	0.83
Forfeited	(11,594)	0.64
Balance at December 31, 2012	158,077	$ 0.97
Granted, (unaudited)	—	—
Vested, (unaudited)	(22,482)	0.94
Forfeited, (unaudited)	—	—
Balance at March 31, 2013, (unaudited)	135,593	$ 1.08

The total fair value of shares vested for the years ended December 31, 2012 and 2011 was $212,795 and $63,010, respectively. The unaudited total fair value of shares vested for the three month periods ended March 31, 2013 and 2012 was $20,993 and $15,933, respectively.

Restricted Stock

The following table summarizes restricted stock option activity at December 31, 2012 and 2011 and March 31, 2013 (unaudited):

	Shares	Weighted Average Grant Date Fair Value
Unvested at January 1, 2011	42,941	$ 0.48
Granted	—	$ —
Vested	(31,347)	0.53
Cancelled	—	—
Unvested at December 31, 2011	11,594	$ 0.64
Granted	—	$ —
Vested	(8,696)	2.23
Cancelled	—	—
Unvested at December 31, 2012	2,898	$ 2.23
Granted, (unaudited)	—	$ —
Vested, (unaudited)	(2,174)	2.67
Cancelled, (unaudited)	—	—
Unvested at March 31, 2013, (unaudited)	724	$ 2.67

At December 31, 2012 and March 31, 2013 (unaudited), unrecognized stock-based compensation expense related to unvested restricted stock was approximately $6,467 and $1,934, respectively, which is expected to be recognized over a weighted average period of approximately four and one months, respectively.

Common Stock Warrants

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. The fair market value of the warrants was calculated on the grant date based on the Black-Scholes-Merton option pricing model, and the Company recorded $12,434 of stock issuance costs for the year ended December 31, 2011.

11. Income Taxes

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

	Year ended December 31,	
	2012	2011
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:

	Year ended December 31,	
	2012	2011
Federal income tax expense at statutory rate	$ (840,190)	$ (718,468)
State and local income taxes, net of federal benefit	(105,170)	(93,678)
Non-deductible expenses	54,991	18,692
Prior-period true-up	(152,306)	—
Research & development credit	(57,293)	—
Increase in valuation allowance	1,099,968	793,454
	$ —	$ —

The income tax effects of temporary differences from continuing operations that give rise to significant portions of deferred income tax assets (liabilities) are presented below:

	December 31,	
	2012	2011
Deferred tax assets:		
Net operating loss carryforward	$ 2,186,432	$ 1,299,322
Research & development credit	189,350	—
Other	50,013	26,505
Valuation allowance	(2,425,795)	(1,325,827)
Deferred income taxes	$ —	$ —

During 2012, the Company's valuation allowance increased by $1,099,968 at December 31, 2012. This increase was primarily due to the generation of additional net operating loss carryforwards and income tax credits.

The Company has approximately $11,408,032 of federal and state operating loss carryforwards which begin to expire in 2023.

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, 2012, 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 income. As of December 31, 2012 and 2011, the Company had no such accruals.

The Company files income tax returns in the United States and various state jurisdictions. The Company is subject to examination by taxing authorities for the tax years ended December 31, 2008 through 2012.

12. Commitments

In January 2011, the Company entered into a twelve month lease agreement for office space commencing on January 1, 2011. The monthly base rent was $3,500. The Company cancelled the lease as of July 2011, when operations moved to North Carolina. Rent expense, net of sublease rental income of $2,750, related to this lease was $22,250 for 2011, which includes base rent of $24,500 and a $500 cancellation fee.

In November 2011, the Company entered into a thirteen month lease agreement for office space commencing on January 1, 2012. The monthly base rent is $3,870, which commences February 1, 2012. The lease term may be extended for an additional 24 months on substantially the same terms. Future minimum lease payments for the year ended December 31, 2013, under the above commitment, was $3,870.

In connection with the convertible note agreement entered into on October 20, 2011 with a vendor for an amount up to $950,000, the Company is required to use the vendor exclusively for the manufacture and supply of the material for the Company's Phase 3 clinical trials and commercialization efforts.

13. Related Party Transactions

In 2010, the Company issued convertible notes in the aggregate principal amount of $926,000 to an investor, the managing member of which is a member of the Company's Board of Directors. In 2011, the Company issued additional convertible notes in the aggregate principal amount of $1,347,709 to the same investor. In September 2011, all of the convertible notes were converted into 1,101,769 shares of Series A Preferred Stock.

The Chairman of the Company's Scientific and Clinical Advisory Board was paid $18,750, $43,750, and $140,625 in consulting fees for the years ended December 31, 2012 and 2011 and the period from inception through December 31, 2012, respectively.

A member of the Company's Scientific and Clinical Advisory Board was paid $0 and $50,000 in consulting fees for the years ended December 31, 2012 and 2011, respectively. The consulting fees paid since inception was $50,000.

A member of the Company's management was paid $30,910, $26,000, and $70,910 in consulting fees for the years ended December 31, 2012 and 2011 and the period from inception through December 31, 2012, respectively.

The Company had a related party payable balance of $0 and $12,371 as of December 31, 2012 and 2011, respectively.

In April 2010, a related party entity advanced the Company $12,500. Interest is calculated on the outstanding balance annually at 3.25%. As of December 31, 2012 and 2011, the outstanding balance was $0 and $12,500, respectively as the entire principal balance was paid in full during 2012. At December 31, 2012 and 2011, accrued interest on this payable was $0 and $686, respectively.

In June 2012, the Company sold its 92.5% ownership interest in Heat II to a related party in exchange for $9,250 in cash and a receivable of $296,224 to be paid in full in seven years from the date of the purchase. Interest accrues on the receivable at a rate of 6% per annum. At December 31, 2012, the Company also has a related party receivable from this entity for $9,571 related to invoices received by the Company pertaining to expenses of Heat II incurred subsequent to the sale of Heat II.

In March 2013, two Board of Director members and the Chief Executive Officer each purchased 2,622 shares of the Company's Series B-1 Preferred Stock at a per share price of $2.67 in its private placement that consummated in March 2013.

See additional related party transactions in Note 6, Convertible Notes Payable and Note 10, Stockholders' Deficit.

14. Net Loss per Common Share

Basic net loss per common share is computed by dividing net loss 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 that are computed using the treasury stock method.

For the years ended December 31, 2012 and 2011 and three month periods ended March 31, 2013 and 2012 (unaudited), all of the Company's common stock options and warrants, preferred stock, and preferred stock warrants are anti-dilutive and therefore have been excluded from the diluted calculation.

15. Subsequent Events

On April 5, 2013, the Non-Formula Line described in Note 7 that was initiated in January of 2013 was paid in full and then extinguished, and thus the collateral funds were returned to the investor.

On May 3, 2013, the Company and the holder of the October 20, 2011 convertible note agreed to extinguish the note, and both parties acknowledged that no further payments were to be made pursuant to the agreement or any other promissory note. At that time, the Company owed the holder $694,479 including accrued interest. The holder of the convertible note agreed to extend the due date of the current payable in the amount of $694,479 to the earlier of July 15, 2013 or when the Company receives additional financing of gross proceeds of $2,500,000. If such financing does not occur prior to July 15, 2013 then one half of the payables owed as of July 15, 2013 shall be due July 15, 2013 and the balance shall remain payable until such a financing is consummated.

On May 29, 2013, the Company effected a 1-for-2.3 reverse stock split of its issued and outstanding shares of common stock. The reverse stock split resulted in an adjustment to the preferred stock conversion price to reflect a proportional decrease in the number of shares of common stock to be issued upon conversion. Accordingly, all share and per share amounts for all periods presented in these consolidated financial statements and notes thereto have been adjusted retrospectively, where applicable, to reflect the reverse stock split. The Company filed a Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation which made the reverse stock split effective and authorized 50,000,000 shares of $0.0002 par value common stock and 10,000,000 shares of $0.0001 par value preferred stock.

On May 29, 2013, the Company entered into an agreement with the holders of its Series B Preferred Stock pursuant to which it agreed that the terms of the Stock Purchase Agreement dated as of March 25, 2013 between the Company and the holders of the Series B Preferred Stock will be amended such that upon consummation of a Qualified Public Offering, the investors of the Series B-1 Preferred Stock will be issued shares of the Company's common stock having an aggregate value of $361,669 on such date and the Company's obligation to issue, and the investors obligation to purchase, Series B-2 Preferred Stock and warrants upon fulfillment of the conditions specified in our Stock Purchase Agreement with the investors will terminate.

On May 29, 2013, the Company entered into an amendment to its stock purchase warrants with North Carolina Biotechnology Center and Square 1 Bank pursuant to which the warrants previously issued to North Carolina Biotechnology Center that were exercisable for shares of Series A Preferred Stock were amended to be exercisable for a like number of shares of common stock.

1,650,000 Shares
Common Stock

PROSPECTUS

Sole Book-Running Manager

Aegis Capital Corp

Co-Manager

Cantor Fitzgerald & Co.

, 2013

Until , 2013, all dealers that buy, sell or trade our common stock may be required to deliver a prospectus, regardless of whether they are participating in this offering. This is in addition to the dealers' obligation to deliver a prospectus when acting as underwriters and with respect to their unsold allotments or subscriptions.

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 by the selling security holders) 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 Securities and Exchange Commission ("SEC") registration fee, FINRA filing fee and NADAQ listing fee are estimates.

SEC registration fee	$ 3,275
FINRA registration fee	4,102
NASDAQ listing fee	50,000
Accounting fees and expenses	150,000
Legal fees and expenses	80,000
Printing and related expenses	5,000
Transfer agent fees and expenses	2,000
Miscellaneous	212,348
Total	$ 506,725

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, or 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 and Issuances of Unregistered Securities.

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.

In March 2013, we issued an aggregate of 1,891,419 shares of our Series B-1 Preferred Stock to 20 investors for aggregate gross proceeds of $5,050,090.

In August 2012, we issued a warrant to Square 1 Bank exercisable for 7,609 shares of our Series A Preferred Stock in connection with the loan and security agreement that was entered into. The warrants have an exercise price of $4.83 and expire August 7, 2022.

In April 2012, May 2012, October 2012, and November 2012 we issued options exercisable for an aggregate of 178,742 shares of our common stock at an exercise price of $0.76 per share to six individuals and two entities for services rendered.

In December 2011, we issued a warrant exercisable for 12,940 shares of our Series A Preferred Stock to the North Carolina Biotechnology Center in connection with its loan to the Company of $250,000. The principal plus accrued interest was due on December 14, 1014 and the loan agreement accrued interest at a rate of 4.25% per annum. The warrant is exercisable for a period of ten years at a price per share of $4.83, contains a cashless exercise feature and contains a weighted average price adjustment feature.

In December 2011, we issued 73,455 shares of Series A Preferred Stock to one investor for a purchase price of $2.10 per share and aggregate proceeds of $154,256.

In October and November 2011, we issued options exercisable for an aggregate of 70,873 shares of our common stock at an exercise price of $0.64 per share to four individuals for services rendered.

In September 2011, one investor converted the outstanding debt owed to him that was evidenced by a convertible note into 53,887 shares of common stock. The issuance qualified for exemption under Section 3(a)(9) of the Securities Act.

In September 2011, one investor converted the outstanding debt owed to him that was evidenced by a convertible note into 20,910 shares of common stock. The issuance qualified for exemption under Section 3(a)(9) of the Securities Act.

In September 2011, one investor converted the outstanding debt owed to him that was evidenced by four convertible notes into 479,030 shares of common stock. The issuance qualified for exemption under Section 3(a)(9) of the Securities Act.

In August 2011, May 2011, September 2010 and May 2010 we issued to one investor a convertible promissory note in the principal amounts of $922,709, $425,000, $576,000 and $350,000, respectively, all with an interest rate of 3% per annum accruing monthly and all of which were subsequently converted into 1,101,769 shares of Series A Preferred Stock at a conversion price of $2.10 per share.

In June 2011 we issued a convertible promissory note in the principal amount of $100,000 with an interest rate of 3% per annum accruing monthly to one investor, which was subsequently converted into 48,092 shares of Preferred Stock.

In March and April 2011, we issued options exercisable for an aggregate of 263,158 shares of our common stock at an exercise price of $0.64 and $0.71 per share to ten individuals for services rendered.

In March 2011, we granted warrants exercisable for an aggregate of 32,610 shares of our common stock to 5 individuals for services rendered in connection with a placement agency agreement we had with Paramount BioCapital, a company no longer in existence. The warrants are exercisable at $0.48 per share, vested immediately upon exercise and expire on March 21, 2021.

In September and November 2010, we issued options exercisable for an aggregate of 78,266 shares of our common stock at exercise prices of $0.48 per share to ten individuals for services rendered.

In May 2010, we issued one convertible promissory note to one investor in the principal amount of $250,000 with an interest rate of 3% per annum accruing monthly, which was subsequently converted into 123,939 shares of Preferred Stock at a conversion price of $2.10 per share.

Unless otherwise stated, the sales of the above securities 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), 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. The recipients of the securities in each of these transactions represented their intentions to acquire the securities for investment only and not with a view to or for sale in connection with any distribution thereof, and appropriate legends were placed upon the stock certificates issued in these transactions.

Item 16. Exhibits.

Exhibit No.	Description
1.1	Form of Underwriting Agreement between Heat Biologics, Inc. and Aegis Capital Corp., as representative of the several underwriters
3.1 *	Certificate of Incorporation filed on June 10, 2008
3.2 *	Amended and Restated Bylaws, as currently in effect
3.3 *	Amended and Restated Certificate of Incorporation filed on October 16, 2009
3.4 *	Second Amended and Restated Certificate of Incorporation filed on December 16, 2011
3.5 *	Third Amended and Restated Certificate of Incorporation, as currently in effect
3.6	Certificate of Amendment to the Third Amended and Restated Certificate of Incorporation filed on May 29, 2013
4.1 *	2009 Stock Incentive Plan
4.2 *	First Amendment of the 2009 Stock Incentive Plan
4.3 *	Second Amendment of the 2009 Stock Incentive Plan
4.4 *	Third Amendment of the 2009 Stock Incentive Plan
4.5 *	Fourth Amendment of the 2009 Stock Incentive Plan
4.6 *	Warrant issued to Square 1 Bank
4.7	Warrant issued to North Carolina Biotechnology Center
4.8 *	Specimen Common Stock Certificate of Heat Biologics, Inc.
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)##
4.10	Form of Representative's Warrant
4.11	Amendment to Stock Warrant with North Carolina Biotechnology Center
4.12	Amendment to Stock Warrant with Square 1 Bank
5.1	Opinion of Gracin & Marlow, LLP
10.1 *	License Agreement (UMJ110) between the University of Miami and Heat Biologics, Inc. effective February 18, 2011 ##
10.2 *	License Agreement (97-14) between the University of Miami and its School of Medicine and Heat Biologics, Inc. effective July 11, 2008 ##
10.3 *	License Agreement (143) between the University of Miami and its School of Medicine and Heat Biologics I, Inc. effective February 11, 2011 ##
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 ##
10.5 *	License Agreement (SS114A) between the University of Miami and its School of Medicine and Heat Biologics I, Inc. effective February 18, 2011 ##
10.6 *	Promissory Note with North Carolina Biotechnology Center dated December 14, 2011
10.7 *	Loan Agreement with North Carolina Biotechnology Center dated December 14, 2011
10.8 *	Common Stock Subscription Agreement between the University of Miami and Heat Biologics I, Inc. dated July 7, 2009
10.9 *	Employment Agreement with Jeffrey Wolf dated December 18, 2009
10.10 *	Amendment to Employment Agreement with Jeffrey Wolf dated as of January 1, 2011
10.11 *	Lease with Europa Center dated as of November 18, 2011
10.12 *	Non-Exclusive Evaluation and Biological Material License Agreement with American Type Culture Collection effective April 12, 2011 ##
10.13 *	Manufacturing Services Agreement with Lonza Walkersville, Inc. dated as of October 20, 2011
10.14 *	Assignment and Assumption Agreement dated June 26, 2009
10.15 *	Termination Agreement UM97-114 dated June 26, 2009
10.16 *	Loan and Security Agreement with Square 1 Bank dated August 7, 2012
10.17	Employment Agreement with Jennifer Harris dated November 3, 2011 and amendment thereto dated May 1, 2013
10.18 *	Amendment to License Agreement (UM97-14) dated April 29, 2009
10.19 *	First Amendment to Loan and Security Agreement with Square 1 Bank dated November 30, 2012
10.20 *	Second Amendment to License Agreement (UMSS-114) dated August 11, 2009
10.21 *	Exclusive License between Heat Biologics, Inc. and the University of Michigan dated July 22, 2011
10.22 *	1st Lease Modification Agreement dated December 19, 2012
10.23 *	Form of Co Sale and First Refusal Agreement by and among Heat Biologics, Inc and the Series B investors
10.24 *	Form of Voting Agreement by and among Heat Biologics, Inc. and the Series B investors
10.25 *	Form of Investor's Rights Agreement by and among Heat Biologics, Inc. and the Series B investors
10.26 *	Second Amendment to Loan and Security Agreement with Square 1 Bank dated January 14, 2013
10.27 *	Third Amendment to Loan and Security Agreement with Square 1 Bank dated February 28, 2013
10.28 *	Fourth Amendment to Loan and Security Agreement with Square 1 Bank dated March 19, 2013

10.29 *	Option Contract for Exclusive License between Heat Biologics, Inc. and the University of Miami dated April 1, 2013
10.30 *	Fifth Amendment to the Loan and Security Agreement with Square 1 Bank dated April 18, 2013
10.31	Employment Agreement with Matthew Czajkowski dated May 15, 2013
10.32	Form of Lock-up Agreement
10.33	Form of Agreement with Series B Preferred Stockholders to amend Stock Purchase Agreement
21.1 *	Subsidiaries of Heat Biologics, Inc.
23.1	Consent of BDO USA, LLP
23.2	Consent of Gracin & Marlow, LLP (included in Exhibit 5.1)
24.1 *	Power of Attorney

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Confidential treatment has been requested as to certain portions of this exhibit. The omitted portions have been filed with the Securities and Exchange Commission.

* Previously filed with the Securities and Exchange Commission on May 6, 2013

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. 1 to the Registration Statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Chapel Hill, State of North Carolina, May 30, 2013.

HEAT BIOLOGICS, INC.

By: */s/ Jeffrey Wolf*
Name: Jeffrey Wolf
Title: Chairman and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, this Amendment No. 1 to the Registration Statement has been signed by the following persons in the capacities and on the dates indicated.

Date: May 30, 2013

By: */s/ Jeffrey Wolf*
Jeffrey Wolf
Chairman and Chief Executive Officer
(Principal Executive Officer)

Date: May 30, 2013

By: */s/ Matthew Czajkowski*
Matthew Czajkowski
Chief Financial Officer
(Principal Financial and Accounting Officer)

Date: May 30, 2013

By: /s/ *John Monahan, Ph.D.**
John Monahan, Ph.D.
Director

Date: May 30, 2013

By: /s/ *Michael Kharitonov, Ph.D.**
Michael Kharitonov, Ph.D.
Director

Date: May 30, 2013

By: /s/ *Paul Belsky, MD**
Paul Belsky, MD
Director

Date: May 30, 2013

By: /s/ *Edward B. Smith**
Edward B. Smith
Director

*By: /s/ Jeffrey Wolf
as attorney-in-fact

EXHIBIT 1.1

UNDERWRITING AGREEMENT

between

HEAT BIOLOGICS, INC.

and

AEGIS CAPITAL CORP.,

as Representative of the Several Underwriters

HEAT BIOLOGICS, INC.

UNDERWRITING AGREEMENT

New York, New York
[•], 2013

Aegis Capital Corp.
As Representative of the several Underwriters named on Schedule 1 attached hereto
810 Seventh Avenue, 18th Floor
New York, New York 10019

Ladies and Gentlemen:

The undersigned, Heat Biologics, Inc., a corporation formed under the laws of the State of Delaware (collectively with its subsidiaries and affiliates, including, without limitation, all entities disclosed or described in the Registration Statement (as hereinafter defined) as being subsidiaries or affiliates of Heat Biologics, Inc., the "**Company**"), hereby confirms its agreement (this "**Agreement**") with Aegis Capital Corp. (hereinafter referred to as "you" (including its correlatives) or the "**Representative**") and with the other underwriters named on Schedule 1 hereto for which the Representative is acting as representative (the Representative and such other underwriters being collectively called the "**Underwriters**" or, individually, an "**Underwriter**") as follows:

1. Purchase and Sale of Shares.

1.1 Firm Shares.

1.1.1. Nature and Purchase of Firm Shares.

(i) On the basis of the representations and warranties herein contained, but subject to the terms and conditions herein set forth, the Company agrees to issue and sell to the several Underwriters, an aggregate of [•] shares ("**Firm Shares**") of the Company's common stock, par value $0.0002 per share (the "**Common Stock**").

(ii) The Underwriters, severally and not jointly, agree to purchase from the Company the number of Firm Shares set forth opposite their respective names on Schedule 1 attached hereto and made a part hereof at a purchase price of $[•] per share (93% of the per Firm Share offering price). The Firm Shares are to be offered initially to the public at the offering price set forth on the cover page of the Prospectus (as defined in Section 2.1.1 hereof).

1.1.2. Shares Payment and Delivery.

(i) Delivery and payment for the Firm Shares shall be made at 10:00 a.m., Eastern time, on the third (3rd) Business Day following the effective date (the "**Effective Date**") of the Registration Statement (as defined in Section 2.1.1 below) (or the fourth (4th) Business Day following the Effective Date if the Registration Statement is declared effective after 4:01 p.m., Eastern time) or at such earlier time as shall be agreed upon by the Representative and the Company, at the offices of Reed Smith LLP, 599 Lexington Avenue, New York, New York 10022 (" **Representative Counsel**"), or at such other place (or remotely by facsimile or other electronic transmission) as shall be agreed upon by the Representative and the Company. The hour and date of delivery and payment for the Firm Shares is called the "**Closing Date**."

(ii) Payment for the Firm Shares shall be made on the Closing Date by wire transfer in Federal (same day) funds, payable to the order of the Company upon delivery of the certificates (in form and substance satisfactory to the Underwriters) representing the Firm Shares (or through the facilities of the Depository Trust Company ("**DTC**")) for the account of the Underwriters. The Firm Shares shall be registered in such name or names and in such authorized denominations as the Representative may request in writing at least two (2) full Business Days prior to the Closing Date. The Company shall not be obligated to sell or deliver the Firm Shares except upon tender of payment by the Representative for all of the Firm Shares. The term "**Business Day**" means any day other than a Saturday, a Sunday or a legal holiday or a day on which banking institutions are authorized or obligated by law to close in New York, New York.

1.2 Over-allotment Option.

1.2.1. Option Shares. For the purposes of covering any over-allotments in connection with the distribution and sale of the Firm Shares, the Company hereby grants to the Underwriters an option to purchase up to [•] additional shares of Common Stock, representing fifteen percent (15%) of the Firm Shares sold in the offering, from the Company (the "**Over-allotment Option**"). Such [•] additional shares of Common Stock, the net proceeds of which will be deposited with the Company's account, are hereinafter referred to as "**Option Shares**." The purchase price to be paid per Option Share shall be equal to the price per Firm Share set forth in Section 1.1.1 hereof. The Firm Shares and the Option Shares are hereinafter referred to together as the "**Public Securities**." The offering and sale of the Public Securities is hereinafter referred to as the "**Offering**."

1.2.2. Exercise of Option. The Over-allotment Option granted pursuant to Section 1.2.1 hereof may be exercised by the Representative as to all (at any time) or any part (from time to time) of the Option Shares within 45 days after the Effective Date. The Underwriters shall not be under any obligation to purchase any Option Shares prior to the exercise of the Over-allotment Option. The Over-allotment Option granted hereby may be exercised by the giving of oral notice to the Company from the Representative, which must be confirmed in writing by overnight mail or facsimile or other electronic transmission setting forth the number of Option Shares to be purchased and the date and time for delivery of and payment for the Option Shares (the "**Option Closing Date**"), which shall not be later than five (5) full Business Days after the date of the notice or such other time as shall be agreed upon by the Company and the Representative, at the offices of Representative Counsel or at such other place (including remotely by facsimile or other electronic transmission) as shall be agreed upon by the Company and the Representative. If such delivery and payment for the Option Shares does not occur on the Closing Date, the Option Closing Date will be as set forth in the notice. Upon exercise of the Over-allotment Option with respect to all or any portion of the Option Shares, subject to the terms and conditions set forth herein, (i) the Company shall become obligated to sell to the Underwriters the number of Option Shares specified in such notice and (ii) each of the Underwriters, acting severally and not jointly, shall purchase that portion of the total number of Option Shares then being purchased as set forth in Schedule 1 opposite the name of such Underwriter.

1.2.3. Payment and Delivery. Payment for the Option Shares shall be made on the Option Closing Date by wire transfer in Federal (same day) funds, payable to the order of the Company upon delivery to you of certificates (in form and substance satisfactory to the Underwriters) representing the Option Shares (or through the facilities of DTC) for the account of the Underwriters. The Option Shares shall be registered in such name or names and in such authorized denominations as the Representative may request in writing at least two (2) full Business Days prior to the Option Closing Date. The Company shall not be obligated to sell or deliver the Option Shares except upon tender of payment by the Representative for applicable Option Shares.

1.3 Representative's Warrants.

1.3.1. Purchase Warrants. The Company hereby agrees to issue and sell to the Representative (and/or its designees) on the Closing Date an option ("**Representative's Warrant** ") for the purchase of an aggregate of [•] shares of Common Stock, representing 5.0% of the Firm Shares (excluding the Option Shares), for an aggregate purchase price of $100.00. The Representative's Warrant agreement, in the form attached hereto as Exhibit A (the "**Representative's Warrant Agreement**"), shall be exercisable, in whole or in part, commencing on a date which is one (1) year after the Effective Date and expiring on the five-year anniversary of the Effective Date at an initial exercise price per shares of Common Stock of $[•], which is equal to 125.0% of the initial public offering price of the Firm Shares. The Representative's Warrant Agreement and the shares of Common Stock issuable upon exercise thereof are hereinafter referred to together as the "**Representative's Securities**." The Representative understands and agrees that there are significant restrictions pursuant to FINRA Rule 5110 against transferring the Representative's Warrant Agreement and the underlying shares of Common Stock during the one hundred eighty (180) days after the Effective Date and by its acceptance thereof shall agree that it will not sell, transfer, assign, pledge or hypothecate the Representative's Warrant Agreement, or any portion thereof, or be the subject of any hedging, short sale, derivative, put or call transaction that would result in the effective economic disposition of such securities for a period of one hundred eighty (180) days following the Effective Date to anyone other than (i) an Underwriter or a selected dealer in connection with the Offering, or (ii) a bona fide officer or partner of the Representative or of any such Underwriter or selected dealer; and only if any such transferee agrees to the foregoing lock-up restrictions.

1.3.2. Delivery. Delivery of the Representative's Warrant Agreement shall be made on the Closing Date and shall be issued in the name or names and in such authorized denominations as the Representative may request.

2. Representations and Warranties of the Company. The Company represents and warrants to the Underwriters as of the Applicable Time (as defined below), as of the Closing Date and as of the Option Closing Date, if any, as follows:

2.1 Filing of Registration Statement.

2.1.1. Pursuant to the Securities Act. The Company has filed with the U.S. Securities and Exchange Commission (the " **Commission**") a registration statement, and an amendment or amendments thereto, on Form S-1 (File No. 333-188365), including any related prospectus or prospectuses, for the registration of the Public Securities and the Representative's Securities under the Securities Act of 1933, as amended (the "**Securities Act**"), which registration statement and amendment or amendments have been prepared by the Company in all material respects in conformity with the requirements of the Securities Act and the rules and regulations of the Commission under the Securities Act (the "**Securities Act Regulations**") and will contain all material statements that are required to be stated therein in accordance with the Securities Act and the Securities Act Regulations. Except as the context may otherwise require, such registration statement, as amended, on file with the Commission at the time the registration statement became effective (including the Preliminary Prospectus included in the registration statement, financial statements, schedules, exhibits and all other documents filed as a part thereof or incorporated therein and all information deemed to be a part thereof as of the Effective Date pursuant to paragraph (b) of Rule 430A of the Securities Act Regulations (the "**Rule 430A Information**")), is referred to herein as the "**Registration Statement**." If the Company files any registration statement pursuant to Rule 462(b) of the Securities Act Regulations, then after such filing, the term "**Registration Statement**" shall include such registration statement filed pursuant to Rule 462(b). The Registration Statement has been declared effective by the Commission on the date hereof.

Each prospectus used prior to the effectiveness of the Registration Statement, and each prospectus that omitted the Rule 430A Information that was used after such effectiveness and prior to the execution and delivery of this Agreement, is herein called a "**Preliminary Prospectus**." The Preliminary Prospectus, subject to completion, dated [•], 2013, that was included in the Registration Statement immediately prior to the Applicable Time is hereinafter called the "**Pricing Prospectus**." The final prospectus in the form first furnished to the Underwriters for use in the Offering is hereinafter called the "**Prospectus**." Any reference to the "most recent Preliminary Prospectus" shall be deemed to refer to the latest Preliminary Prospectus included in the Registration Statement.

"**Applicable Time**" means [TIME] [a.m./p.m.], Eastern time, on the date of this Agreement.

"**Issuer Free Writing Prospectus**" means any "issuer free writing prospectus," as defined in Rule 433 of the Securities Act Regulations ("**Rule 433**"), including without limitation any "free writing prospectus" (as defined in Rule 405 of the Securities Act Regulations) relating to the Public Securities that is (i) required to be filed with the Commission by the Company, (ii) a "road show that is a written communication" within the meaning of Rule 433(d)(8)(i), whether or not required to be filed with the Commission, or (iii) exempt from filing with the Commission pursuant to Rule 433(d)(5)(i) because it contains a description of the Public Securities or of the Offering that does not reflect the final terms, 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).

"**Issuer General Use Free Writing Prospectus**" means any Issuer Free Writing Prospectus that is intended for general distribution to prospective investors (other than a "*bona fide* electronic road show," as defined in Rule 433 (the " **Bona Fide Electronic Road Show**")), as evidenced by its being specified in Schedule 2-B hereto.

"**Issuer Limited Use Free Writing Prospectus**" means any Issuer Free Writing Prospectus that is not an Issuer General Use Free Writing Prospectus.

"**Pricing Disclosure Package**" means any Issuer General Use Free Writing Prospectus issued at or prior to the Applicable Time, the Pricing Prospectus and the information included on Schedule 2-A hereto, all considered together.

2.1.2. Pursuant to the Exchange Act. The Company has filed with the Commission a Form 8-A (File Number 000-[•]) providing for the registration pursuant to Section 12(b) under the Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), of the shares of Common Stock; and such Form 8-A has become effective under the Exchange Act. The Company has taken no action designed to, or likely to have the effect of, terminating the registration of the shares of Common Stock under the Exchange Act, nor has the Company received any notification that the Commission is contemplating terminating such registration.

2.2 Stock Exchange Listing. The shares of Common Stock have been approved for listing on The NASDAQ Capital Market (the "**Exchange**"), and the Company has taken no action designed to, or likely to have the effect of, delisting the shares of Common Stock from the Exchange, nor has the Company received any notification that the Exchange is contemplating terminating such listing except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.3 No Stop Orders, etc. Neither the Commission nor, to the Company's knowledge, any state regulatory authority has issued any order preventing or suspending the use of the Registration Statement, any Preliminary Prospectus or the Prospectus or has instituted or, to the Company's

knowledge, threatened to institute, any proceedings with respect to such an order. The Company has complied with each request (if any) from the Commission for additional information.

2.4 Disclosures in Registration Statement.

2.4.1. Compliance with Securities Act and 10b-5 Representation.

(i) Each of the Registration Statement and any post-effective amendment thereto, at the time it became effective, complied in all material respects with the requirements of the Securities Act and the Securities Act Regulations. Each Preliminary Prospectus, including the prospectus filed as part of the Registration Statement as originally filed or as part of any amendment or supplement thereto, and the Prospectus, at the time each was filed with the Commission, complied in all material respects with the requirements of the Securities Act and the Securities Act Regulations. Each Preliminary Prospectus delivered to the Underwriters for use in connection with this Offering and the Prospectus was or will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T.

(ii) Neither the Registration Statement nor any amendment thereto, at its effective time, as of the Applicable Time, at the Closing Date or at any Option Closing Date (if any), contained, contains or will contain an untrue statement of a material fact or omitted, omits or will omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading.

(iii) The Pricing Disclosure Package, as of the Applicable Time, at the Closing Date or at any Option Closing Date (if any), did not, does not and will not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; and each Issuer Limited Use Free Writing Prospectus hereto does not conflict with the information contained in the Registration Statement, any Preliminary Prospectus, the Pricing Prospectus or the Prospectus, and each such Issuer Limited Use Free Writing Prospectus, as supplemented by and taken together with the Pricing Prospectus as of the Applicable Time, did not include an untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading; provided, however, that this representation and warranty shall not apply to statements made or statements omitted in reliance upon and in conformity with written information furnished to the Company with respect to the Underwriters by the Representative expressly for use in the Registration Statement, the Pricing Prospectus or the Prospectus or any amendment thereof or supplement thereto. The parties acknowledge and agree that such information provided by or on behalf of any Underwriter consists solely of the following disclosure contained in the "Underwriting" section of the Prospectus: (i) the second sentence of the second paragraph under the heading "Discounts" and (ii) the first sentence under the heading "Stabilization" (collectively, the "**Underwriters' Information**"); and

(iv) Neither the Prospectus nor any amendment or supplement thereto (including any prospectus wrapper), as of its issue date, at the time of any filing with the Commission pursuant to Rule 424(b), at the Closing Date or at any Option Closing Date, included, includes or will include an untrue statement of a material fact or omitted, omits or will omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading; provided, however, that this representation and warranty shall not apply to the Underwriters' Information.

2.4.2. Disclosure of Agreements. The agreements and documents described in the Registration Statement, the Pricing Disclosure Package and the Prospectus conform in all material respects to the descriptions thereof contained therein and there are no agreements or other documents

required by the Securities Act and the Securities Act Regulations to be described in the Registration Statement, the Pricing Disclosure Package and the Prospectus or to be filed with the Commission as exhibits to the Registration Statement, that have not been so described or filed. Each agreement or other instrument (however characterized or described) to which the Company is a party or by which it is or may be bound or affected and (i) that is referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus, or (ii) is material to the Company's business, has been duly authorized and validly executed by the Company, is in full force and effect in all material respects and is enforceable against the Company and, to the Company's knowledge, the other parties thereto, in accordance with its terms, except (x) as such enforceability may be limited by bankruptcy, insolvency, reorganization or similar laws affecting creditors' rights generally, (y) as enforceability of any indemnification or contribution provision may be limited under the federal and state securities laws, and (z) that the remedy of specific performance and injunctive and other forms of equitable relief may be subject to the equitable defenses and to the discretion of the court before which any proceeding therefor may be brought. None of such agreements or instruments has been assigned by the Company, and neither the Company nor, to the Company's knowledge, any other party is in default thereunder and, to the Company's knowledge, no event has occurred that, with the lapse of time or the giving of notice, or both, would constitute a default thereunder. To the best of the Company's knowledge, performance by the Company of the material provisions of such agreements or instruments will not result in a violation of any existing applicable law, rule, regulation, judgment, order or decree of any governmental agency or court, domestic or foreign, having jurisdiction over the Company or any of its assets or businesses (each, a "**Governmental Entity**"), including, without limitation, those relating to environmental laws and regulations.

2.4.3. Prior Securities Transactions. No securities of the Company have been sold by the Company or by or on behalf of, or for the benefit of, any person or persons controlling, controlled by or under common control with the Company, except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Preliminary Prospectus.

2.4.4. Regulations. The disclosures in the Registration Statement, the Pricing Disclosure Package and the Prospectus concerning the effects of federal, state, local and all foreign regulation on the Offering and the Company's business as currently contemplated are correct in all material respects and no other such regulations are required to be disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus which are not so disclosed.

2.5 Changes After Dates in Registration Statement.

2.5.1. No Material Adverse Change. Since the respective dates as of which information is given in the Registration Statement, the Pricing Disclosure Package and the Prospectus, except as otherwise specifically stated therein: (i) there has been no material adverse change in the financial position or results of operations of the Company, nor any change or development that, singularly or in the aggregate, would involve a material adverse change or a prospective material adverse change, in or affecting the condition (financial or otherwise), results of operations, business, assets or prospects of the Company (a "**Material Adverse Change**"); (ii) there have been no material transactions entered into by the Company, other than as contemplated pursuant to this Agreement; and (iii) no officer or director of the Company has resigned from any position with the Company.

2.5.2. Recent Securities Transactions, etc. Subsequent to the respective dates as of which information is given in the Registration Statement, the Pricing Disclosure Package and the Prospectus, and except as may otherwise be indicated or contemplated herein or disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has not: (i) issued any securities or incurred any liability or obligation, direct or contingent, for borrowed money other than under its existing loan agreements or in the ordinary course of business; or (ii) declared or paid any dividend or made any other distribution on or in respect to its capital stock.

2.6 [*Reserved*.]

2.7 Independent Accountants. To the knowledge of the Company, BDO USA, LLP (the " **Auditor**"), whose report is filed with the Commission as part of the Registration Statement, the Pricing Disclosure Package and the Prospectus, is an independent registered public accounting firm as required by the Securities Act and the Securities Act Regulations and the Public Company Accounting Oversight Board. The Auditor has not, during the periods covered by the financial statements included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, provided to the Company any non-audit services, as such term is used in Section 10A(g) of the Exchange Act.

2.8 Financial Statements, etc. The financial statements, including the notes thereto and supporting schedules included in the Registration Statement, the Pricing Disclosure Package and the Prospectus, fairly present the financial position and the results of operations of the Company at the dates and for the periods to which they apply; and such financial statements have been prepared in conformity with U.S. generally accepted accounting principles ("**GAAP**"), consistently applied throughout the periods involved (provided that unaudited interim financial statements are subject to year-end audit adjustments that are not expected to be material in the aggregate and do not contain all footnotes required by GAAP); and the supporting schedules included in the Registration Statement present fairly the information required to be stated therein. Except as included therein, no historical or pro forma financial statements are required to be included in the Registration Statement, the Pricing Disclosure Package or the Prospectus under the Securities Act or the Securities Act Regulations. The pro forma and pro forma as adjusted financial information and the related notes, if any, included in the Registration Statement, the Pricing Disclosure Package and the Prospectus have been properly compiled and prepared in accordance with the applicable requirements of the Securities Act and the Securities Act Regulations and present fairly the information shown therein, and the assumptions used in the preparation thereof are reasonable and the adjustments used therein are appropriate to give effect to the transactions and circumstances referred to therein. All disclosures contained in the Registration Statement, the Pricing Disclosure Package or the Prospectus regarding "non-GAAP financial measures" (as such term is defined by the rules and regulations of the Commission), if any, comply with Regulation G of the Exchange Act and Item 10 of Regulation S-K of the Securities Act, to the extent applicable. Each of the Registration Statement, the Pricing Disclosure Package and the Prospectus discloses all material off-balance sheet transactions, arrangements, obligations (including contingent obligations), and other relationships of the Company with unconsolidated entities or other persons that may have a material current or future effect on the Company's financial condition, changes in financial condition, results of operations, liquidity, capital expenditures, capital resources, or significant components of revenues or expenses. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, (a) neither the Company nor any of its direct and indirect subsidiaries, including each entity disclosed or described in the Registration Statement, the Pricing Disclosure Package and the Prospectus as being a subsidiary of the Company (each, a "**Subsidiary**" and, collectively, the "**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 , or, other than in the course of business, any grants under any stock compensation pla n, and (d) there has not been any material adverse change in the Company's long-term or short-term debt.

2.9 Authorized Capital; Options, etc. The Company had, at the date or dates indicated in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the duly authorized, issued and outstanding capitalization as set forth therein. Based on the assumptions stated in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company will have on the Closing Date the adjusted stock capitalization set forth therein. Except as set forth in, or contemplated by, the Registration Statement, the Pricing Disclosure Package and the Prospectus, on the Effective Date, as of

the Applicable Time and on the Closing Date and any Option Closing Date, there will be no stock options, warrants, or other rights to purchase or otherwise acquire any authorized, but unissued shares of Common Stock of the Company or any security convertible or exercisable into shares of Common Stock of the Company, or any contracts or commitments to issue or sell shares of Common Stock or any such options, warrants, rights or convertible securities.

2.10 Valid Issuance of Securities, etc.

2.10.1. Outstanding Securities. All issued and outstanding securities of the Company issued prior to the transactions contemplated by this Agreement have been duly authorized and validly issued and are fully paid and non-assessable; the holders thereof have no rights of rescission with respect thereto, and are not subject to personal liability by reason of being such holders; and none of such securities were issued in violation of the preemptive rights of any holders of any security of the Company or similar contractual rights granted by the Company. The authorized shares of Common Stock conform in all material respects to all statements relating thereto contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus. The offers and sales of the outstanding shares of Common Stock were at all relevant times either registered under the Securities Act and the applicable state securities or "blue sky" laws or, based in part on the representations and warranties of the purchasers of such Shares, exempt from such registration requirements.

2.10.2. Securities Sold Pursuant to this Agreement. The Public Securities and Representative's Securities have been duly authorized for issuance and sale and, when issued and paid for, will be validly issued, fully paid and non-assessable; the holders thereof are not and will not be subject to personal liability by reason of being such holders; the Public Securities and Representative's Securities are not and will not be subject to the preemptive rights of any holders of any security of the Company or similar contractual rights granted by the Company; and all corporate action required to be taken for the authorization, issuance and sale of the Public Securities and Representative's Securities has been duly and validly taken. The Public Securities and Representative's Securities conform in all material respects to all statements with respect thereto contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus. All corporate action required to be taken for the authorization, issuance and sale of the Representative's Warrant Agreement has been duly and validly taken; the shares of Common Stock issuable upon exercise of the Representative's Warrant have been duly authorized and reserved for issuance by all necessary corporate action on the part of the Company and when paid for and issued in accordance with the Representative's Warrant and the Representative's Warrant Agreement, such shares of Common Stock will be validly issued, fully paid and non-assessable; the holders thereof are not and will not be subject to personal liability by reason of being such holders; and such shares of Common Stock are not and will not be subject to the preemptive rights of any holders of any security of the Company or similar contractual rights granted by the Company.

2.11 Registration Rights of Third Parties. Except as set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus, no holders of any securities of the Company or any rights exercisable for or convertible or exchangeable into securities of the Company have the right to require the Company to register any such securities of the Company under the Securities Act or to include any such securities in a registration statement to be filed by the Company.

2.12 Validity and Binding Effect of Agreements. This Agreement and the Representative's Warrant Agreement have been duly and validly authorized by the Company, and, when executed and delivered, will constitute, the valid and binding agreements of the Company, enforceable against the Company in accordance with their respective terms, except: (i) as such enforceability may be limited by bankruptcy, insolvency, reorganization or similar laws affecting creditors' rights generally; (ii) as enforceability of any indemnification or contribution provision may be limited under the federal and state securities laws; and (iii) that the remedy of specific performance and injunctive and other forms of

equitable relief may be subject to the equitable defenses and to the discretion of the court before which any proceeding therefor may be brought.

2.13 No Conflicts, etc. The execution, delivery and performance by the Company of this Agreement, the Representative's Warrant Agreement and all ancillary documents, the consummation by the Company of the transactions herein and therein contemplated and the compliance by the Company with the terms hereof and thereof do not and will not, with or without the giving of notice or the lapse of time or both: (i) result in a material breach of, or conflict with any of the terms and provisions of, or constitute a material default under, or result in the creation, modification, termination or imposition of any lien, charge or encumbrance upon any property or assets of the Company pursuant to the terms of any agreement or instrument to which the Company is a party; (ii) result in any violation of the provisions of the Company's Certificate of Incorporation (as the same may be amended or restated from time to time, the "**Charter**") or the by-laws of the Company (as the same may be amended or restated from time to time); or (iii) violate any existing applicable law, rule, regulation, judgment, order or decree of any Governmental Entity as of the date hereof (including, without limitation, those promulgated 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 regulatory authority performing functions similar to those performed by the FDA).

2.14 No Defaults; Violations. No material default exists in the due performance and observance of any term, covenant or condition of any material license, contract, indenture, mortgage, deed of trust, note, loan or credit agreement, or any other agreement or instrument evidencing an obligation for borrowed money, or any other material agreement or instrument to which the Company is a party or by which the Company may be bound or to which any of the properties or assets of the Company is subject. The Company is not in violation of any term or provision of its Charter or by-laws, or in violation of any franchise, license, permit, applicable law, rule, regulation, judgment or decree of any Governmental Entity.

2.15 Corporate Power; Licenses; Consents.

2.15.1. Conduct of Business. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has all requisite corporate power and authority, and has all necessary authorizations, approvals, orders, licenses, certificates and permits of and from all governmental regulatory officials and bodies that it needs as of the date hereof to conduct its business purpose as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.15.2. Transactions Contemplated Herein. The Company has all corporate power and authority to enter into this Agreement and to carry out the provisions and conditions hereof, and all consents, authorizations, approvals and orders required in connection therewith have been obtained. No consent, authorization or order of, and no filing with, any court, government agency or other body is required for the valid issuance, sale and delivery of the Public Securities and the consummation of the transactions and agreements contemplated by this Agreement and the Representative's Warrant Agreement and as contemplated by the Registration Statement, the Pricing Disclosure Package and the Prospectus, except with respect to applicable federal and state securities laws and the rules and regulations of the Financial Industry Regulatory Authority, Inc. ("**FINRA**").

2.16 D&O Questionnaires. To the Company's knowledge, all information contained in the questionnaires (the " **Questionnaires**") completed by each of the Company's directors and officers immediately prior to the Offering, as supplemented by all information concerning the Company's directors, officers and principal shareholders as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, provided to the Underwriters, is true and correct in all material

respects and the Company has not become aware of any information which would cause the information disclosed in the Questionnaires to become materially inaccurate and incorrect.

2.17 Litigation; Governmental Proceedings. There is no action, suit, proceeding, inquiry, arbitration, investigation, litigation or governmental proceeding pending or, to the Company's knowledge, threatened against, or involving the Company or, to the Company's knowledge, any executive officer or director which has not been disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus or in connection with the Company's listing application for the listing of the Public Securities on the Exchange.

2.18 Good Standing. The Company has been duly organized and is validly existing as a corporation and is in good standing under the laws of the State of Delaware as of the date hereof, and is duly qualified to do business and is in good standing in each other jurisdiction in which its ownership or lease of property or the conduct of business requires such qualification, except where the failure to qualify, singularly or in the aggregate, would not have or reasonably be expected to result in a Material Adverse Change.

2.19 Insurance. The Company carries or is entitled to the benefits of insurance, with reputable insurers, in such amounts and covering such risks which the Company believes are adequate, and all such insurance is in full force and effect. The Company has no reason to believe that it will not be able (i) to renew its existing insurance coverage as and when such policies expire or (ii) to obtain comparable coverage from similar institutions as may be necessary or appropriate to conduct its business as now conducted and at a cost that would not result in a Material Adverse Change.

2.20 Transactions Affecting Disclosure to FINRA.

2.20.1. Finder's Fees. Except as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, there are no claims, payments, arrangements, agreements or understandings relating to the payment of a finder's, consulting or origination fee by the Company or any Insider with respect to the sale of the Public Securities hereunder or any other arrangements, agreements or understandings of the Company or, to the Company's knowledge, any of its shareholders that may affect the Underwriters' compensation, as determined by FINRA.

2.20.2. Payments Within Twelve (12) Months. Except as described in the Registration Statement, the Pricing 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, consulting fee or otherwise, in consideration of such person raising capital for the Company or introducing to the Company persons who raised or 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 twelve (12) months prior to the Effective Date, other than the payment to the Underwriters as provided hereunder in connection with the Offering.

2.20.3. Use of Proceeds. None of the net proceeds of the Offering will be paid by the Company to any participating FINRA member or its affiliates, except as specifically authorized herein.

2.20.4. FINRA Affiliation. There is no (i) officer or director of the Company, (ii) beneficial owner of 5% or more of any class of the Company's securities or (iii) beneficial owner of the Company's unregistered equity securities which were acquired during the 180-day period immediately preceding the filing of the Registration Statement that is an affiliate or associated person of a FINRA member participating in the Offering (as determined in accordance with the rules and regulations of FINRA).

2.20.5. Information. All information provided by the Company in its FINRA questionnaire to Representative Counsel specifically for use by Representative Counsel in connection with its Public Offering System filings (and related disclosure) with FINRA is true, correct and complete in all material respects.

2.21 Foreign Corrupt Practices Act . None of the Company and its Subsidiaries or, to the Company's knowledge, any director, officer, agent, employee or affiliate of the Company and its Subsidiaries or any other person acting on behalf of the Company and its Subsidiaries, has, directly or indirectly, given or agreed to give any money, gift or similar benefit (other than legal price concessions to customers in the ordinary course of business) to any customer, supplier, employee or agent of a customer or supplier, or official or employee of any governmental agency or instrumentality of any government (domestic or foreign) or any political party or candidate for office (domestic or foreign) or other person who was, is, or may be in a position to help or hinder the business of the Company (or assist it in connection with any actual or proposed transaction) that (i) might subject the Company to any damage or penalty in any civil, criminal or governmental litigation or proceeding, (ii) if not given in the past, might have had a Material Adverse Change or (iii) if not continued in the future, might adversely affect the assets, business, operations or prospects of the Company. The Company has taken reasonable steps to ensure that its accounting controls and procedures are sufficient to cause the Company to comply in all material respects with the Foreign Corrupt Practices Act of 1977, as amended.

2.22 Compliance with OFAC. None of the Company and its Subsidiaries or, to the Company's knowledge, any director, officer, agent, employee or affiliate of the Company and its Subsidiaries or any other person acting on behalf of the Company and its Subsidiaries, is currently subject to any U.S. sanctions administered by the Office of Foreign Assets Control of the U.S. Department of the Treasury ("**OFAC**"), and the Company will not, directly or indirectly, use the proceeds of the Offering hereunder, or lend, contribute or otherwise make available such proceeds to any subsidiary, joint venture partner or other person or entity, for the purpose of financing the activities of any person currently subject to any U.S. sanctions administered by OFAC.

2.23 Money Laundering Laws. The operations of the Company and its Subsidiaries are and have been conducted at all times in compliance with applicable financial recordkeeping and reporting requirements of the Currency and Foreign Transactions Reporting Act of 1970, as amended, the money laundering statutes of all jurisdictions, the rules and regulations thereunder and any related or similar rules, regulations or guidelines, issued, administered or enforced by any Governmental Entity (collectively, the "**Money Laundering Laws**"); and no action, suit or proceeding by or before any Governmental Entity involving the Company with respect to the Money Laundering Laws is pending or, to the best knowledge of the Company, threatened.

2.24 Regulatory. All preclinical and clinical studies conducted by or on behalf of the Company that are material to the Company and its Subsidiaries, taken as a whole, are or have been adequately described in the Registration Statement, the Pricing Disclosure Package and the Prospectus in all material respects. The clinical and preclinical studies conducted by or on behalf of the Company and its Subsidiaries that are described in the Registration Statement, the Pricing Disclosure Package and the Prospectus or the results of which are referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus were and, if still ongoing, are being conducted in material compliance with all laws and regulations applicable thereto in the jurisdictions in which they are being conducted and with all laws and regulations applicable to preclinical and clinical studies from which data will be submitted to support marketing approval. The descriptions in the Registration Statement, the Pricing Disclosure Package and the Prospectus of the results of such studies are accurate and complete in all material respects and fairly present the data derived from such studies, and the Company has no knowledge of, or reason to believe that, any large well-controlled clinical study the aggregate results of which are inconsistent with or otherwise call into question the results of any clinical study conducted by or on

behalf of the Company that are described in the Registration Statement, the Pricing Disclosure Package and the Prospectus or the results of which are referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has not received any written notices or statements from the FDA, the European Medicines Agency ("**EMA**") or any other governmental agency or authority imposing, requiring, requesting or suggesting a clinical hold, termination, suspension or material modification for or of any clinical or preclinical studies that are described in the Registration Statement, the Pricing Disclosure Package and the Prospectus or the results of which are referred to in the Registration Statement, the Pricing Disclosure Package and the Prospectus. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company has not received any written notices or statements from the FDA, the EMA or any other governmental agency, and otherwise has no knowledge of, or reason to believe that, (i) any investigational new drug application for any potential product of the Company is or has been rejected or placed on clinical hold; and (ii) any license, approval, permit or authorization to conduct any clinical trial of any potential product of the Company has been, will be or may be suspended, revoked, modified or limited.

2.25 Officers' Certificate. Any certificate signed by any duly authorized officer of the Company and delivered to you or to Representative Counsel shall be deemed a representation and warranty by the Company to the Underwriters as to the matters covered thereby.

2.26 Lock-Up Agreements. Schedule 3 hereto contains a complete and accurate list of the Company's officers, directors and each holder of the Company's outstanding shares of Common Stock (or securities convertible or exercisable into shares of Common Stock) (collectively, the "**Lock-Up Parties**"). The Company has caused each of the Lock-Up Parties to deliver to the Representative an executed Lock-Up Agreement, in the form attached hereto as Exhibit B **(**the "**Lock-Up Agreement**"), prior to the execution of this Agreement.

2.27 Subsidiaries. All direct and indirect Subsidiaries of the Company are duly organized and in good standing under the laws of the place of organization or incorporation, and each Subsidiary is in good standing in each jurisdiction in which its ownership or lease of property or the conduct of business requires such qualification, except where the failure to qualify would not have a material adverse effect on the assets, business or operations of the Company taken as a whole. The Company's ownership and control of each Subsidiary is as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.28 Related Party Transactions. There are no business relationships or related party transactions involving the Company or any other person required to be described in the Registration Statement, the Pricing Disclosure Package and the Prospectus that have not been described as required.

2.29 Board of Directors. The Board of Directors of the Company is comprised of the persons set forth under the heading of the Pricing Prospectus and the Prospectus captioned "Management." The qualifications of the persons serving as board members and the overall composition of the board comply with the Exchange Act and the rules and regulations of the Commission promulgated thereunder (the "**Exchange Act Regulations**"), the Sarbanes-Oxley Act of 2002 and the rules promulgated thereunder (the "**Sarbanes-Oxley Act**") applicable to the Company and the listing rules of the Exchange. At least one member of the Audit Committee of the Board of Directors of the Company qualifies as an "audit committee financial expert," as such term is defined under Regulation S-K and the listing rules of the Exchange. In addition, at least a majority of the persons serving on the Board of Directors qualify as "independent," as defined under the listing rules of the Exchange.

2.30 Sarbanes-Oxley Compliance.

2.30.1. Disclosure Controls. Except as set forth in the Registration Statement, the General Disclosure Package and the Prospectus, the Company has developed and currently maintains disclosure controls and procedures that will comply with Rule 13a-15 or 15d-15 under the Exchange Act Regulations, and such controls and procedures are effective to ensure that all material information concerning the Company will be made known on a timely basis to the individuals responsible for the preparation of the Company's Exchange Act filings and other public disclosure documents.

2.30.2. Compliance. Except as set forth in the Registration Statement, the General Disclosure Package and the Prospectus, the Company is, or at the Applicable Time and on the Closing Date will be, in material compliance with the provisions of the Sarbanes-Oxley Act applicable to it, and has implemented or will implement such programs and taken reasonable steps to ensure the Company's future compliance (not later than the relevant statutory and regulatory deadlines therefor) with all of the material provisions of the Sarbanes-Oxley Act.

2.31 Accounting Controls. The Company and its Subsidiaries maintain systems of "internal control over financial reporting" (as defined under Rules 13a-15 and 15d-15 under the Exchange Act Regulations) that comply with the requirements of the Exchange Act and have been designed by, or under the supervision of, their respective principal executive and principal financial officers, or persons performing similar functions, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with GAAP, including, but not limited to, internal accounting controls sufficient to provide reasonable assurance that (i) transactions are executed in accordance with management's general or specific authorizations; (ii) transactions are recorded as necessary to permit preparation of financial statements in conformity with GAAP and to maintain asset accountability; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with the existing assets at reasonable intervals and appropriate action is taken with respect to any differences. Except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company is not aware of any material weaknesses in its internal controls. The Company's auditors and the Audit Committee of the Board of Directors of the Company have been advised of: (i) all significant deficiencies and material weaknesses in the design or operation of internal controls over financial reporting which are known to the Company's management and that have adversely affected or are reasonably likely to adversely affect the Company' ability to record, process, summarize and report financial information; and (ii) any fraud known to the Company's management, whether or not material, that involves management or other employees who have a significant role in the Company's internal controls over financial reporting.

2.32 No Investment Company Status. The Company is not and, after giving effect to the Offering and the application of the proceeds thereof as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, will not be, required to register as an "investment company," as defined in the Investment Company Act of 1940, as amended.

2.33 No Labor Disputes. No labor dispute with the employees of the Company or any of its Subsidiaries exists or, to the knowledge of the Company, is imminent.

2.34 Intellectual Property Rights. The Company or its Subsidiaries owns or possesses or has valid rights 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 Rights**") 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 Pricing Disclosure

Package and the Prospectus. To the knowledge of the Company, no action or use by the Company or any of its Subsidiaries necessary for the conduct of its business as currently carried on and as described in the Registration Statement, the Pricing Disclosure Package and the Prospectus will involve or give rise to any infringement of, or license or similar fees (other than license or similar fees described or contemplated in the Registration Statement, the Pricing Disclosure Package and the Prospectus) for, any Intellectual Property Rights of others. Neither the Company nor any of its Subsidiaries has received any notice alleging any such infringement of, license or simlar fees for, or conflict with, any asserted Intellectual Property Rights of others. Except as would not reasonably be expected to result, individually or in the aggregate, in a Material Adverse Change, (A) to the knowledge of the Company, there is no infringement, misappropriation or violation by third parties of any of the Intellectual Property Rights owned by the Company; (B) there is no pending or, to the knowledge of the Company, threatened action, suit, proceeding or claim by others challenging the rights of the Company in or to any such Intellectual Property Rights, and the Company is unaware of any facts which would form a reasonable basis for any such claim, that would, individually or in the aggregate, together with any other claims in this Section 2.34, reasonably be expected to result in a Material Adverse Change; (C) the Intellectual Property Rights owned by the Company and, to the knowledge of the Company, the Intellectual Property Rights licensed to the Company have not been adjudged by a court of competent jurisdiction invalid or unenforceable, in whole or in part, and there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others challenging the validity or scope of any such Intellectual Property Rights, and the Company is unaware of any facts which would form a reasonable basis for any such claim that would, individually or in the aggregate, together with any other claims in this Section 2.34, reasonably be expected to result in a Material Adverse Change; (D) there is no pending or, to the Company's knowledge, threatened action, suit, proceeding or claim by others that the Company infringes, misappropriates or otherwise violates any Intellectual Property Rights or other proprietary rights of others, the Company has not received any written notice of such claim and the Company is unaware of any other facts which would form a reasonable basis for any such claim that would, individually or in the aggregate, together with any other claims in this Section 2.34, reasonably be expected to result in a Material Adverse Change; and (E) to the Company's knowledge, no employee of the Company is in or has ever been in violation in any material respect of any term of any employment contract, patent disclosure agreement, invention assignment agreement, non-competition agreement, non-solicitation agreement, nondisclosure agreement or any restrictive covenant to or with a former employer where the basis of such violation relates to such employee's employment with the Company, or actions undertaken by the employee while employed with the Company and could reasonably be expected to result, individually or in the aggregate, in a Material Adverse Change. To the Company's knowledge, all material technical information developed by and belonging to the Company which has not been disclosed in a filed patent application has been kept confidential. The Company is not a party to or bound by any options, licenses or agreements with respect to the Intellectual Property Rights of any other person or entity that are required to be set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus and are not described therein. The Registration Statement, the Pricing Disclosure Package and the Prospectus contain in all material respects the same description of the matters set forth in the preceding sentence. None of the technology employed by the Company has been obtained or is being used by the Company in violation of any contractual obligation binding on the Company or, to the Company's knowledge, any of its officers, directors or employees, or otherwise in violation of the rights of any persons..

2.35 Taxes. Each of the Company and its Subsidiaries has 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. Each of the Company and its Subsidiaries has 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. 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. Except as disclosed in writing to the Underwriters, (i) 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 (ii) 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.

2.36 ERISA Compliance. The Company and any "employee benefit plan" (as defined under the Employee Retirement Income Security Act of 1974, as amended, and the regulations and published interpretations thereunder (collectively, "**ERISA**")) established or maintained by the Company or its "ERISA Affiliates" (as defined below) are in compliance in all material respects with ERISA. "**ERISA Affiliate**" means, with respect to the Company, any member of any group of organizations described in Sections 414(b),(c),(m) or (o) of the Internal Revenue Code of 1986, as amended, and the regulations and published interpretations thereunder (the "**Code**") of which the Company is a member. No "reportable event" (as defined under ERISA) has occurred or is reasonably expected to occur with respect to any "employee benefit plan" established or maintained by the Company or any of its ERISA Affiliates. No "employee benefit plan" established or maintained by the Company or any of its ERISA Affiliates, if such "employee benefit plan" were terminated, would have any "amount of unfunded benefit liabilities" (as defined under ERISA). Neither the Company nor any of its ERISA Affiliates has incurred or reasonably expects to incur any material liability under (i) Title IV of ERISA with respect to termination of, or withdrawal from, any "employee benefit plan" or (ii) Sections 412, 4971, 4975 or 4980B of the Code. Each "employee benefit plan" established or maintained by the Company or any of its ERISA Affiliates that is intended to be qualified under Section 401(a) of the Code is so qualified and, to the knowledge of the Company, nothing has occurred, whether by action or failure to act, which would cause the loss of such qualification.

2.37 Compliance with Laws. The Company: (A) is and at all times has been in compliance with all statutes, rules, or regulations applicable to the ownership, testing, development, manufacture, packaging, processing, use, distribution, storage or disposal of any product manufactured or distributed by the Company ("**Applicable Laws**"), except as could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Change; (B) has not received any FDA Form 483, notice of adverse finding, warning letter, untitled letter or other correspondence or written notice from the FDA or any other governmental authority alleging or asserting noncompliance with any Applicable Laws or any licenses, certificates, approvals, clearances, authorizations, permits and supplements or amendments thereto required by any such Applicable Laws ("**Authorizations**"); (C) possesses all material Authorizations and such Authorizations are valid and in full force and effect and are not in material violation of any term of any such Authorizations; (D) has not received written notice of any claim, action, suit, proceeding, hearing, enforcement, investigation, arbitration or other action from any governmental authority or third party alleging that any product operation or activity is in violation of any Applicable Laws or Authorizations and has no knowledge that any such governmental authority or third party is considering any such claim, litigation, arbitration, action, suit, investigation or proceeding, except as could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Change; (E) has not received written notice that any governmental authority has taken, is taking or intends to take action to limit, suspend, modify or revoke any Authorizations and has no knowledge that any such governmental authority is considering such action, except as could not, individually or in the aggregate, reasonably be expected to have a Material Adverse Change; and (F) has filed, obtained, maintained or submitted all material reports, documents, forms, notices, applications, records, claims, submissions and

supplements or amendments as required by any Applicable Laws or Authorizations and that all such reports, documents, forms, notices, applications, records, claims, submissions and supplements or amendments were complete and correct in all material respects on the date filed (or were corrected or supplemented by a subsequent submission).

2.38 Environmental Laws. The Company and its Subsidiaries are in compliance with all foreign, federal, state and local rules, laws and regulations relating to the use, treatment, storage and disposal of hazardous or toxic substances or waste and protection of health and safety or the environment which are applicable to their businesses ("**Environmental Laws**"), except where the failure to comply would not, singularly or in the aggregate, result in a Material Adverse Change. There has been no storage, generation, transportation, handling, treatment, disposal, discharge, emission, or other release of any kind of toxic or other wastes or other hazardous substances by, due to, or caused by the Company or any of its Subsidiaries (or, to the Company's knowledge, any other entity for whose acts or omissions the Company or any of its Subsidiaries is or may otherwise be liable) upon any of the property now or previously owned or leased by the Company or any of its Subsidiaries, or upon any other property, in violation of any law, statute, ordinance, rule, regulation, order, judgment, decree or permit or which would, under any law, statute, ordinance, rule (including rule of common law), regulation, order, judgment, decree or permit, give rise to any liability, except for any violation or liability which would not have, singularly or in the aggregate with all such violations and liabilities, a Material Adverse Change; and there has been no disposal, discharge, emission or other release of any kind onto such property or into the environment surrounding such property of any toxic or other wastes or other hazardous substances with respect to which the Company has knowledge, except for any such disposal, discharge, emission, or other release of any kind which would not have, singularly or in the aggregate with all such discharges and other releases, a Material Adverse Change. In the ordinary course of business, the Company and its Subsidiaries conduct periodic reviews of the effect of Environmental Laws on their business and assets, in the course of which they identify and evaluate associated costs and liabilities (including, without limitation, any capital or operating expenditures required for clean-up, closure of properties or compliance with Environmental Laws or governmental permits issued thereunder, any related constraints on operating activities and any potential liabilities to third parties). On the basis of such reviews, the Company and its Subsidiaries have reasonably concluded that such associated costs and liabilities would not have, singularly or in the aggregate, a Material Adverse Change.

2.39 Real Property. Except as set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus, the Company and each of its Subsidiaries have good and marketable title in fee simple to, or have valid rights to lease or otherwise use, all items of real or personal property which are material to the business of the Company and its Subsidiaries taken as a whole, in each case free and clear of all liens, encumbrances, security interests, claims and defects that do not, singly or in the aggregate, materially affect the value of such property and do not interfere with the use made and proposed to be made of such property by the Company or any of its Subsidiaries; and all of the leases and subleases material to the business of the Company and its subsidiaries, considered as one enterprise, and under which the Company or any of its subsidiaries holds properties described in the Registration Statement, the Pricing Disclosure Package and the Prospectus, are in full force and effect, and neither the Company nor any Subsidiary has received any notice of any material claim of any sort that has been asserted by anyone adverse to the rights of the Company or any Subsidiary under any of the leases or subleases mentioned above, or affecting or questioning the rights of the Company or such Subsidiary to the continued possession of the leased or subleased premises under any such lease or sublease.

2.40 Contracts Affecting Capital. There are no transactions, arrangements or other relationships between and/or among the Company, any of its affiliates (as such term is defined in Rule 405 of the Securities Act Regulations) and any unconsolidated entity, including, but not limited to, any structured finance, special purpose or limited purpose entity that could reasonably be expected to materially affect the Company's or any of its Subsidiaries' liquidity or the availability of or requirements

for their capital resources required to be described or incorporated by reference in the Registration Statement, the Pricing Disclosure Package and the Prospectus which have not been described or incorporated by reference as required.

2.41 Loans to Directors or Officers. There are no outstanding loans, advances (except normal advances for business expenses in the ordinary course of business) or guarantees or indebtedness by the Company or any of its Subsidiaries to or for the benefit of any of the officers or directors of the Company, any of its Subsidiaries or any of their respective family members, except as disclosed in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

2.42 Ineligible Issuer. At the time of filing the Registration Statement and any post-effective amendment thereto, at the time of effectiveness of the Registration Statement and any amendment thereto, at the earliest time thereafter that the Company or another offering participant made a bona fide offer (within the meaning of Rule 164(h)(2) of the Securities Act Regulations) of the Public Securities and at the date hereof, the Company was not and is not an "ineligible issuer," as defined in Rule 405, without taking account of any determination by the Commission pursuant to Rule 405 that it is not necessary that the Company be considered an ineligible issuer.

2.43 Smaller Reporting Company. As of the time of filing of the Registration Statement, the Company was a "smaller reporting company," as defined in Rule 12b-2 of the Exchange Act Regulations.

2.44 Industry Data. The statistical and market-related data included in each of the Registration Statement, the Pricing Disclosure Package and the Prospectus are based on or derived from sources that the Company reasonably and in good faith believes are reliable and accurate or represent the Company's good faith estimates that are made on the basis of data derived from such sources.

2.45 Emerging Growth Company. From the time of the initial confidential submission of the Registration Statement to the Commission (or, if earlier, the first date on which the Company engaged directly in or through any Person authorized to act on its behalf in any Testing-the Waters Communication) through the date hereof, the Company has been and is an "emerging growth company," as defined in Section 2(a) of the Securities Act (an "**Emerging Growth Company**"). "**Testing-the-Waters Communication**" means any oral or written communication with potential investors undertaken in reliance on Section 5(d) of the Securities Act.

2.46 Testing-the-Waters Communications. The Company has not (i) alone engaged in any Testing-the-Waters Communications, other than Testing-the-Waters Communications with the written consent of the Representative and with entities that are qualified institutional buyers within the meaning of Rule 144A under the Securities Act or institutions that are accredited investors within the meaning of Rule 501 under the Securities Act and (ii) authorized anyone other than the Representative to engage in Testing-the-Waters Communications. The Company confirms that the Representative has been authorized to act on its behalf in undertaking Testing-the-Waters Communications. The Company has not distributed any Written Testing-the-Waters Communications other than those listed on Schedule 2-C hereto. "**Written Testing-the-Waters Communication**" means any Testing-the-Waters Communication that is a written communication within the meaning of Rule 405 under the Securities Act.

2.47 Electronic Road Show. The Company has made available a Bona Fide Electronic Road Show in compliance with Rule 433(d)(8)(ii) of the Securities Act Regulations such that no filing of any "road show" (as defined in Rule 433(h) of the Securities Act Regulations) is required in connection with the Offering.

2.48 Margin Securities. The Company owns no "margin securities" as that term is defined in Regulation U of the Board of Governors of the Federal Reserve System (the "**Federal Reserve Board**"), and none of the proceeds of Offering will be used, directly or indirectly, for the purpose of purchasing or carrying any margin security, for the purpose of reducing or retiring any indebtedness which was originally incurred to purchase or carry any margin security or for any other purpose which might cause any of the shares of Common Stock to be considered a "purpose credit" within the meanings of Regulation T, U or X of the Federal Reserve Board.

2.49 Minute Books. The minute books of the Company have been made available to the Underwriters and counsel for the Underwriters, and such books (i) contain a complete summary of all meetings and actions of the board of directors (including each board committee) and stockholders of the Company (or analogous governing bodies and interest holders, as applicable), and each of its Subsidiaries since the time of its respective incorporation or organization through the date of the latest meeting and action, and (ii) accurately in all material respects reflect all transactions referred to in such minutes. There are no material transactions, agreements, dispositions or other actions of the Company that are not properly approved and/or accurately and fairly recorded in the minute books of the Company, as applicable.

2.50 Reverse Stock Split. The Company has taken all necessary corporate action to effectuate a reverse stock split of its shares of Common Stock on the basis of one (1) such share for each 2.3089 issued and outstanding shares thereof (the "**Reverse Stock Split**"), such Reverse Stock Split to be effective no later than the first trading day of the Firm Shares following the date hereof.

3. Covenants of the Company. The Company covenants and agrees as follows:

3.1 Amendments to Registration Statement. The Company shall deliver to the Representative, prior to filing, any amendment or supplement to the Registration Statement or Prospectus proposed to be filed after the Effective Date and not file any such amendment or supplement to which the Representative shall reasonably object in writing.

3.2 Federal Securities Laws.

3.2.1. Compliance. The Company, subject to Section 3.2.2, shall comply with the requirements of Rule 430A of the Securities Act Regulations, and will notify the Representative promptly, and confirm the notice in writing, (i) when any post-effective amendment to the Registration Statement shall become effective or any amendment or supplement to the Prospectus shall have been filed; (ii) of the receipt of any comments from the Commission; (iii) of any request by the Commission for any amendment to the Registration Statement or any amendment or supplement to the Prospectus or for additional information; (iv) of the issuance by the Commission of any stop order suspending the effectiveness of the Registration Statement or any post-effective amendment or of any order preventing or suspending the use of any Preliminary Prospectus or the Prospectus, or of the suspension of the qualification of the Public Securities and Representative's Securities for offering or sale in any jurisdiction, or of the initiation or threatening of any proceedings for any of such purposes or of any examination pursuant to Section 8(d) or 8(e) of the Securities Act concerning the Registration Statement and (v) if the Company becomes the subject of a proceeding under Section 8A of the Securities Act in connection with the Offering of the Public Securities and Representative's Securities. The Company shall effect all filings required under Rule 424(b) of the Securities Act Regulations, in the manner and within the time period required by Rule 424(b) (without reliance on Rule 424(b)(8)), and shall take such steps as it deems necessary to ascertain promptly whether the form of prospectus transmitted for filing under Rule 424(b) was received for filing by the Commission and, in the event that it was not, it will promptly file such prospectus. The Company shall use its best efforts to prevent the issuance of any stop order,

prevention or suspension and, if any such order is issued, to obtain the lifting thereof at the earliest possible moment.

3.2.2. Continued Compliance. The Company shall comply with the Securities Act, the Securities Act Regulations, the Exchange Act and the Exchange Act Regulations so as to permit the completion of the distribution of the Public Securities as contemplated in this Agreement and in the Registration Statement, the Pricing Disclosure Package and the Prospectus. If at any time when a prospectus relating to the Public Securities is (or, but for the exception afforded by Rule 172 of the Securities Act Regulations ("**Rule 172**"), would be) required by the Securities Act to be delivered in connection with sales of the Public Securities, any event shall occur or condition shall exist as a result of which it is necessary, in the opinion of counsel for the Underwriters or for the Company, to (i) amend the Registration Statement in order that the Registration Statement will not include an 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; (ii) amend or supplement the Pricing Disclosure Package or the Prospectus in order that the Pricing Disclosure Package or the Prospectus, as the case may be, will not include any untrue statement of a material fact or omit to state a material fact necessary in order to make the statements therein not misleading in the light of the circumstances existing at the time it is delivered to a purchaser or (iii) amend the Registration Statement or amend or supplement the Pricing Disclosure Package or the Prospectus, as the case may be, in order to comply with the requirements of the Securities Act or the Securities Act Regulations, the Company will promptly (A) give the Representative notice of such event; (B) prepare any amendment or supplement as may be necessary to correct such statement or omission or to make the Registration Statement, the Pricing Disclosure Package or the Prospectus comply with such requirements and, a reasonable amount of time prior to any proposed filing or use, furnish the Representative with copies of any such amendment or supplement and (C) file with the Commission any such amendment or supplement; provided that the Company shall not file or use any such amendment or supplement to which the Representative or counsel for the Underwriters shall reasonably object. The Company will furnish to the Underwriters such number of copies of such amendment or supplement as the Underwriters may reasonably request. The Company has given the Representative notice of any filings made pursuant to the Exchange Act or the Exchange Act Regulations within 48 hours prior to the Applicable Time. The Company shall give the Representative notice of its intention to make any such filing from the Applicable Time until the later of the Closing Date and the exercise in full or expiration of the Over-allotment Option specified in Section 1.2 hereof and will furnish the Representative with copies of the related document(s) a reasonable amount of time prior to such proposed filing, as the case may be, and will not file or use any such document to which the Representative or counsel for the Underwriters shall reasonably object.

3.2.3. Exchange Act Registration. For a period of three (3) years after the date of this Agreement, the Company shall use its best efforts to maintain the registration of the shares of Common Stock under the Exchange Act. The Company shall not deregister the shares of Common Stock under the Exchange Act without the prior written consent of the Representative.

3.2.4. Free Writing Prospectuses. The Company agrees that, unless it obtains the prior written consent of the Representative, it shall not make any offer relating to the Public Securities that would constitute an Issuer Free Writing Prospectus or that would otherwise constitute a "free writing prospectus," or a portion thereof, required to be filed by the Company with the Commission or retained by the Company under Rule 433; provided that the Representative shall be deemed to have consented to each Issuer General Use Free Writing Prospectus hereto and any "road show that is a written communication" within the meaning of Rule 433(d)(8)(i) that has been reviewed by the Representative. The Company represents that it has treated or agrees that it will treat each such free writing prospectus consented to, or deemed consented to, by the Underwriters as an "issuer free writing prospectus," as defined in Rule 433, and that it has complied and will comply with the applicable requirements of Rule 433 with respect thereto, including timely filing with the Commission where required, legending and

record keeping. If at any time following issuance of an Issuer Free Writing Prospectus there occurred or occurs an event or development as a result of which such Issuer Free Writing Prospectus conflicted or would conflict with the information contained in the Registration Statement 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 existing at that subsequent time, not misleading, the Company will promptly notify the Underwriters and will promptly amend or supplement, at its own expense, such Issuer Free Writing Prospectus to eliminate or correct such conflict, untrue statement or omission.

3.2.5. Testing-the-Waters Communications. If at any time following the distribution of any Written Testing-the-Waters Communication there occurred or occurs an event or development as a result of which such Written Testing-the-Waters Communication 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 existing at that subsequent time, not misleading, the Company shall promptly notify the Representative and shall promptly amend or supplement, at its own expense, such Written Testing-the-Waters Communication to eliminate or correct such untrue statement or omission.

3.3 Delivery to the Underwriters of Registration Statements. The Company has delivered or made available or shall deliver or make available to the Representative and counsel for the Representative, without charge, signed copies of the Registration Statement as originally filed and each amendment thereto (including exhibits filed therewith) and signed copies of all consents and certificates of experts, and will also deliver to the Underwriters, without charge, a conformed copy of the Registration Statement as originally filed and each amendment thereto (without exhibits) for each of the Underwriters. The copies of the Registration Statement and each amendment thereto furnished to the Underwriters will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T.

3.4 Delivery to the Underwriters of Prospectuses. The Company has delivered or made available or will deliver or make available to each Underwriter, without charge, as many copies of each Preliminary Prospectus as such Underwriter reasonably requested, and the Company hereby consents to the use of such copies for purposes permitted by the Securities Act. The Company will furnish to each Underwriter, without charge, during the period when a prospectus relating to the Public Securities is (or, but for the exception afforded by Rule 172, would be) required to be delivered under the Securities Act, such number of copies of the Prospectus (as amended or supplemented) as such Underwriter may reasonably request. The Prospectus and any amendments or supplements thereto furnished to the Underwriters will be identical to the electronically transmitted copies thereof filed with the Commission pursuant to EDGAR, except to the extent permitted by Regulation S-T.

3.5 Effectiveness and Events Requiring Notice to the Representative. The Company shall use its best efforts to cause the Registration Statement to remain effective with a current prospectus for at least nine (9) months after the Applicable Time, and shall notify the Representative immediately and confirm the notice in writing: (i) of the effectiveness of the Registration Statement and any amendment thereto; (ii) of the issuance by the Commission of any stop order or of the initiation, or the threatening, of any proceeding for that purpose; (iii) of the issuance by any state securities commission of any proceedings for the suspension of the qualification of the Public Securities for offering or sale in any jurisdiction or of the initiation, or the threatening, of any proceeding for that purpose; (iv) of the mailing and delivery to the Commission for filing of any amendment or supplement to the Registration Statement or Prospectus; (v) of the receipt of any comments or request for any additional information from the Commission; and (vi) of the happening of any event during the period described in this Section 3.5 that, in the judgment of the Company, makes any statement of a material fact made in the Registration Statement, the Pricing Disclosure Package or the Prospectus untrue or that requires the making of any

changes in (a) the Registration Statement in order to make the statements therein not misleading, or (b) in the Pricing Disclosure Package or the Prospectus in order to make the statements therein, in light of the circumstances under which they were made, not misleading. If the Commission or any state securities commission shall enter a stop order or suspend such qualification at any time, the Company shall make every reasonable effort to obtain promptly the lifting of such order.

3.6 Review of Financial Statements. For a period of five (5) years after the date of this Agreement, the Company, at its expense, shall cause its regularly engaged independent registered public accounting firm to review (but not audit) the Company's financial statements for each of the three fiscal quarters immediately preceding the announcement of any quarterly financial information.

3.7 Listing. The Company shall use its best efforts to maintain the listing of the shares of Common Stock (including the Public Securities) on the Exchange for at least three years from the date of this Agreement.

3.8 Financial Public Relations Firm. As of the Effective Date, the Company shall have retained a financial public relations firm reasonably acceptable to the Representative and the Company, which shall initially be [ ], which firm shall be experienced in assisting issuers in initial public offerings of securities and in their relations with their security holders, and shall retain such firm or another firm reasonably acceptable to the Representative for a period of not less than two (2) years after the Effective Date.

3.9 Reports to the Representative.

3.9.1. Periodic Reports, etc. For a period of three (3) years after the date of this Agreement, the Company shall furnish to the Representative copies of such financial statements and other periodic and special reports as the Company from time to time furnishes generally to holders of any class of its securities and also promptly furnish to the Representative: (i) a copy of each periodic report the Company shall be required to file with the Commission under the Exchange Act and the Exchange Act Regulations; (ii) a copy of every press release and every news item and article with respect to the Company or its affairs which was released by the Company; (iii) a copy of each Form 8-K prepared and filed by the Company; (iv) five copies of each registration statement filed by the Company under the Securities Act; and (v) such additional documents and information with respect to the Company and the affairs of any future subsidiaries of the Company as the Representative may from time to time reasonably request; provided the Representative shall sign, if requested by the Company, a Regulation FD compliant confidentiality agreement which is reasonably acceptable to the Representative and Representative Counsel in connection with the Representative's receipt of such information. Documents filed with the Commission pursuant to its EDGAR system shall be deemed to have been delivered to the Representative pursuant to this Section 3.9.1.

3.9.2. Transfer Agent; Transfer Sheets. For a period of three (3) years after the date of this Agreement, the Company shall retain a transfer agent and registrar acceptable to the Representative (the "**Transfer Agent**") and shall furnish to the Representative at the Company's sole cost and expense such transfer sheets of the Company's securities as the Representative may reasonably request, including the daily and monthly consolidated transfer sheets of the Transfer Agent and DTC. VStock Transfer, LLC is acceptable to the Representative to act as Transfer Agent for the shares of Common Stock.

3.9.3. Trading Reports. During such time as the Public Securities are listed on the Exchange, the Company shall provide to the Representative, at the Company's expense, such reports published by Exchange relating to price trading of the Public Securities, as the Representative shall reasonably request.

3.10 Payment of Expenses

3.10.1. General Expenses Related to the Offering. The Company hereby agrees to pay on each of the Closing Date and the Option Closing Date, if any, to the extent not paid at the Closing Date, all expenses incident to the performance of the obligations of the Company under this Agreement, including, but not limited to: (a) all filing fees and communication expenses relating to the registration of the shares of Common Stock to be sold in the Offering (including the Over-allotment Shares) with the Commission; (b) all Public Filing System filing fees associated with the review of the Offering by FINRA (and the reasonable fees of FINRA counsel, but only up to $15,000); (c) all fees and expenses relating to the listing of such Public Securities on the Exchange and such other stock exchanges as the Company and the Representative together determine; (d) all fees, expenses and disbursements relating to background checks of the Company's officers and directors in an amount not to exceed $2,500 per individual and $15,000 in the aggregate; (e) all fees, expenses and disbursements relating to the registration or qualification of the Public Securities under the "blue sky" securities laws of such states and other jurisdictions as the Representative with the consent of the Company may designate (including, without limitation, all filing and registration fees, it being agreed that if the Offering is commenced on the Exchange, the Company shall make a payment of $5,000 to such counsel at Closing, or if the Offering is commenced on the Over-the-Counter Bulletin Board, the Company shall make a payment of $15,000 to such counsel upon the commencement of "blue sky" work by such counsel and an additional $5,000 at Closing); (f) all fees, expenses and disbursements relating to the registration, qualification or exemption of the Public Securities under the securities laws of such foreign jurisdictions as the Representative may reasonably designate; (g) the costs of all mailing and printing of the underwriting documents (including, without limitation, the Underwriting Agreement, any Blue Sky Surveys and, if appropriate, any Agreement Among Underwriters, Selected Dealers' Agreement, Underwriters' Questionnaire and Power of Attorney), Registration Statements, Prospectuses and all amendments, supplements and exhibits thereto and as many preliminary and final Prospectuses as the Representative may reasonably deem necessary; (h) the costs and expenses of a public relations firm; (i) the costs of preparing, printing and delivering certificates representing the Public Securities; (j) fees and expenses of the transfer agent for the shares of Common Stock; (k) stock transfer and/or stamp taxes, if any, payable upon the transfer of securities from the Company to the Underwriters; (l) the costs associated with post-Closing advertising of the Offering in the national editions of the Wall Street Journal and New York Times; (m) the costs associated with one set of bound volumes of the public offering materials as well as commemorative mementos and lucite tombstones, each of which the Company or its designee shall provide within a reasonable time after the Closing Date in such quantities as the Representative may reasonably request; (n) the fees and expenses of the Company's accountants; (o) the fees and expenses of the Company's legal counsel and other agents and representatives; (p) the $21,775 cost associated with the Underwriter's use of Ipreo's book-building, prospectus tracking and compliance software for the Offering; and (q) up to $20,000 of the Underwriter's actual accountable "road show" expenses for the Offering. The Representative may deduct from the net proceeds of the Offering payable to the Company on the Closing Date, or the Option Closing Date, if any, the expenses set forth herein to be paid by the Company to the Underwriters.

3.10.2. Non-accountable Expenses. The Company further agrees that, in addition to the expenses payable pursuant to Section 3.10.1, on the Closing Date it shall pay to the Representative, by deduction from the net proceeds of the Offering contemplated herein, a non-accountable expense allowance equal to one percent (1%) of the gross proceeds received by the Company from the sale of the Firm Shares (excluding the Option Shares), less the Advance (as such term is defined in Section 8.3 hereof), provided, however, that in the event that the Offering is terminated, the Company agrees to reimburse the Underwriters pursuant to Section 8.3 hereof.

3.11 Application of Net Proceeds. The Company shall apply the net proceeds from the Offering received by it in a manner consistent with the application thereof described under the caption "Use of Proceeds" in the Registration Statement, the Pricing Disclosure Package and the Prospectus.

3.12 Delivery of Earnings Statements to Security Holders. The Company shall make generally available to its security holders as soon as practicable, but not later than the first day of the fifteenth (15^{th}) full calendar month following the date of this Agreement, an earnings statement (which need not be certified by independent registered public accounting firm unless required by the Securities Act or the Securities Act Regulations, but which shall satisfy the provisions of Rule 158(a) under Section 11(a) of the Securities Act) covering a period of at least twelve (12) consecutive months beginning after the date of this Agreement.

3.13 Stabilization. Neither the Company nor, to its knowledge, any of its employees, directors or shareholders (without the consent of the Representative) has taken or shall take, directly or indirectly, any action designed to or that has constituted or that might reasonably be expected to cause or result in, under Regulation M of the Exchange Act, or otherwise, stabilization or manipulation of the price of any security of the Company to facilitate the sale or resale of the Public Securities.

3.14 Internal Controls. The Company shall maintain a system of internal accounting controls sufficient to provide reasonable assurances that: (i) transactions are executed in accordance with management's general or specific authorization; (ii) transactions are recorded as necessary in order to permit preparation of financial statements in accordance with GAAP and to maintain accountability for assets; (iii) access to assets is permitted only in accordance with management's general or specific authorization; and (iv) the recorded accountability for assets is compared with existing assets at reasonable intervals and appropriate action is taken with respect to any differences.

3.15 Accountants. As of the date of this Agreement, the Company shall retain an independent registered public accounting firm reasonably acceptable to the Representative, and the Company shall continue to retain a nationally recognized independent registered public accounting firm for a period of at least three (3) years after the date of this Agreement. The Representative acknowledges that the Auditor is acceptable to the Representative.

3.16 FINRA. The Company shall advise the Representative (who shall make an appropriate filing with FINRA) if it is or becomes aware that (i) any officer or director of the Company, (ii) any beneficial owner of 5% or more of any class of the Company's securities or (iii) any beneficial owner of the Company's unregistered equity securities which were acquired during the 180 days immediately preceding the filing of the Registration Statement is or becomes an affiliate or associated person of a FINRA member participating in the Offering (as determined in accordance with the rules and regulations of FINRA).

3.17 No Fiduciary Duties. The Company acknowledges and agrees that the Underwriters' responsibility to the Company is solely contractual in nature and that none of the Underwriters or their affiliates or any selling agent shall be deemed to be acting in a fiduciary capacity, or otherwise owes any fiduciary duty to the Company or any of its affiliates in connection with the Offering and the other transactions contemplated by this Agreement.

3.18 Company Lock-Up Agreements.

3.18.1. Restriction on Sales of Capital Stock. The Company, on behalf of itself and any successor entity, agrees that, without the prior written consent of the Representative, it will not, for a period of 180 days after the date of this Agreement (the "**Lock-Up Period**"), (i) offer, pledge, sell, contract to sell, sell any option or contract to purchase, purchase any option or contract to sell, grant any

option, right or warrant to purchase, lend, or otherwise transfer or dispose of, directly or indirectly, any shares of capital stock of the Company or any securities convertible into or exercisable or exchangeable for shares of capital stock of the Company other than the filing of a Registration Statement on Form S-8; (ii) file or cause to be filed any registration statement with the Commission relating to the offering of any shares of capital stock of the Company or any securities convertible into or exercisable or exchangeable for shares of capital stock of the Company; or (iii) enter into any swap or other arrangement that transfers to another, in whole or in part, any of the economic consequences of ownership of capital stock of the Company, whether any such transaction described in clause (i), (ii) or (iii) above is to be settled by delivery of shares of capital stock of the Company or such other securities, in cash or otherwise.

The restrictions contained in this Section 3.18.1 shall not apply to (i) the shares of Common Stock to be sold hereunder, (ii) the issuance by the Company of shares of Common Stock upon the exercise of a stock option or warrant or the conversion of a security outstanding on the date hereof, of which the Representative has been advised in writing or (iii) the issuance by the Company of stock options or shares of capital stock of the Company under any equity compensation plan of the Company.

Notwithstanding the foregoing, if (i) during the last 17 days of the Lock-Up Period, the Company issues an earnings release or material news or a material event relating to the Company occurs, or (ii) prior to the expiration of the Lock-Up Period, the Company announces that it will release earnings results or becomes aware that material news or a material event will occur during the 16-day period beginning on the last day of the Lock-Up Period, the restrictions imposed by this Section 3.18.1 shall continue to apply until the expiration of the 18-day period beginning on the issuance of the earnings release or the occurrence of such material news or material event, as applicable, unless the Representative waives, in writing, such extension; *provided, however*, that this extension of the Lock-Up Period shall not apply to the extent that FINRA has amended or repealed NASD Rule 2711(f)(4), or has otherwise provided written interpretive guidance regarding such rule, in each case, so as to eliminate the prohibition of any broker, dealer, or member of a national securities association from publishing or distributing any research report, with respect to the securities of an Emerging Growth Company prior to or after the expiration of any agreement between the broker, dealer, or member of a national securities association and the Emerging Growth Company or its shareholders that restricts or prohibits the sale of securities held by the Emerging Growth Company or its shareholders after the initial public offering date.

3.18.2. Restriction on Continuous Offerings. Notwithstanding the restrictions contained in Section 3.18.1, the Company, on behalf of itself and any successor entity, agrees that, without the prior written consent of the Representative, it will not, for a period of 12 months after the date of this Agreement, directly or indirectly in any "at-the-market" or continuous equity transaction, offer to sell, sell, contract to sell, grant any option to sell or otherwise dispose of shares of capital stock of the Company or any securities convertible into or exercisable or exchangeable for shares of capital stock of the Company.

3.19 Release of D&O Lock-up Period. If the Representative, in its sole discretion, agrees to release or waive the restrictions set forth in the Lock-Up Agreements described in Section 2.26 hereof for an officer or director of the Company and provide the Company with notice of the impending release or waiver at least three (3) Business Days before the effective date of the release or waiver, the Company agrees to announce the impending release or waiver by a press release substantially in the form of Exhibit C hereto through a major news service at least two (2) Business Days before the effective date of the release or waiver.

3.20 Blue Sky Qualifications. The Company shall use its best efforts, in cooperation with the Underwriters, if necessary, to qualify the Public Securities for offering and sale under the applicable securities laws of such states and other jurisdictions (domestic or foreign) as the Representative may designate with the consent of the Company and to maintain such qualifications in effect so long as

required to complete the distribution of the Public Securities; provided, however, that the Company shall not be obligated to file any general consent to service of process or to qualify as a foreign corporation or as a dealer in securities in any jurisdiction in which it is not so qualified or to subject itself to taxation in respect of doing business in any jurisdiction in which it is not otherwise so subject.

3.21 Reporting Requirements. The Company, during the period when a prospectus relating to the Public Securities is (or, but for the exception afforded by Rule 172, would be) required to be delivered under the Securities Act, will file all documents required to be filed with the Commission pursuant to the Exchange Act within the time periods required by the Exchange Act and Exchange Act Regulations. Additionally, the Company shall report the use of proceeds from the issuance of the Public Securities as may be required under Rule 463 under the Securities Act Regulations.

3.22 Emerging Growth Company Status. The Company shall promptly notify the Representative if the Company ceases to be an Emerging Growth Company at any time prior to the later of (i) completion of the distribution of the Public Securities within the meaning of the Securities Act and (ii) fifteen (15) days following the completion of the Lock-Up Period.

4. Conditions of Underwriters' Obligations. The obligations of the Underwriters to purchase and pay for the Public Securities, as provided herein, shall be subject to (i) the continuing accuracy of the representations and warranties of the Company as of the date hereof and as of each of the Closing Date and the Option Closing Date, if any; (ii) the accuracy of the statements of officers of the Company made pursuant to the provisions hereof; (iii) the performance by the Company of its obligations hereunder; and (iv) the following conditions:

4.1 Regulatory Matters.

4.1.1. Effectiveness of Registration Statement; Rule 430A Information. The Registration Statement has become effective not later than 5:00 p.m., Eastern time, on the date of this Agreement or such later date and time as shall be consented to in writing by you, and, at each of the Closing Date and any Option Closing Date, no stop order suspending the effectiveness of the Registration Statement or any post-effective amendment thereto has been issued under the Securities Act, no order preventing or suspending the use of any Preliminary Prospectus or the Prospectus has been issued and no proceedings for any of those purposes have been instituted or are pending or, to the Company's knowledge, contemplated by the Commission. The Company has complied with each request (if any) from the Commission for additional information. The Prospectus containing the Rule 430A Information shall have been filed with the Commission in the manner and within the time frame required by Rule 424(b) (without reliance on Rule 424(b)(8)) or a post-effective amendment providing such information shall have been filed with, and declared effective by, the Commission in accordance with the requirements of Rule 430A.

4.1.2. FINRA Clearance. On or before the date of this Agreement, the Representative shall have received clearance from FINRA as to the amount of compensation allowable or payable to the Underwriters as described in the Registration Statement.

4.1.3. Exchange Stock Market Clearance. On the Closing Date, the Company's shares of Common Stock, including the Firm Shares, shall have been approved for listing on the Exchange, subject only to official notice of issuance. On the first Option Closing Date (if any), the Company's shares of Common Stock, including the Option Shares, shall have been approved for listing on the Exchange, subject only to official notice of issuance.

4.2 Company Counsel Matters.

4.2.1. Closing Date Opinion of Counsel. On the Closing Date, the Representative shall have received the favorable opinion of Gracin & Marlow, LLP, counsel to the Company, dated the Closing Date and addressed to the Representative, in a form reasonably acceptable to the Representative.

4.2.2. Opinion of Special Intellectual Property Counsel for the Company. On the Closing Date, the Representative shall have received the opinion of Stanley A. Kim, P.A., special intellectual property counsel for the Company, dated the Closing Date and addressed to the Representative, in a form reasonably acceptable to the Representative.

4.2.3. Opinion of Special Regulatory Counsel for the Company. On the Closing Date, the Representative shall have received the opinion of Hyman, Phelps & McNamara, P.C., special regulatory counsel for the Company, dated the Closing Date and addressed to the Representative, in a form reasonably acceptable to the Representative

4.2.4. Option Closing Date Opinions of Counsel. On the Option Closing Date, if any, the Representative shall have received the favorable opinions of each counsel listed in Sections 4.2.1, 4.2.2 and 4.2.3, dated the Option Closing Date, addressed to the Representative and in form and substance reasonably satisfactory to the Representative, confirming as of the Option Closing Date, the statements made by such counsels in their respective opinions delivered on the Closing Date.

4.2.5. Reliance. In rendering such opinions, such counsel may rely: (i) as to matters involving the application of laws other than the laws of the United States and jurisdictions in which they are admitted, to the extent such counsel deems proper and to the extent specified in such opinion, if at all, upon an opinion or opinions (in form and substance reasonably satisfactory to the Representative) of other counsel reasonably acceptable to the Representative, familiar with the applicable laws; and (ii) as to matters of fact, to the extent they deem proper, on certificates or other written statements of officers of the Company and officers of departments of various jurisdictions having custody of documents respecting the corporate existence or good standing of the Company, provided that copies of any such statements or certificates shall be delivered to Representative Counsel if requested. The opinions of each of Gracin & Marlow, LLP, Stanley A. Kim, P.A. and Hyman, Phelps & McNamara, P.C., and any opinion relied upon by either Gracin & Marlow, LLP, Stanley A. Kim, P.A. or Hyman, Phelps & McNamara, P.C., shall include a statement to the effect that it may be relied upon by Representative Counsel in its opinion delivered to the Underwriters.

4.3 Comfort Letters.

4.3.1. Cold Comfort Letter. At the time this Agreement is executed you shall have received a cold comfort letter containing statements and information of the type customarily included in accountants' comfort letters with respect to the financial statements and certain financial information contained in the Registration Statement, the Pricing Disclosure Package and the Prospectus, addressed to the Representative and in form and substance satisfactory in all respects to you and to the Auditor, dated as of the date of this Agreement.

4.3.2. Bring-down Comfort Letter. At each of the Closing Date and the Option Closing Date, if any, the Representative shall have received from the Auditor a letter, dated as of the Closing Date or the Option Closing Date, as applicable, to the effect that the Auditor reaffirms the statements made in the letter furnished pursuant to Section 4.3.1, except that the specified date referred to shall be a date not more than three (3) business days prior to the Closing Date or the Option Closing Date, as applicable.

4.4 Officers' Certificates.

4.4.1. Officers' Certificate. The Company shall have furnished to the Representative a certificate, dated the Closing Date and any Option Closing Date (if such date is other than the Closing Date), of its Executive Chairman of the Board, its Chief Executive Officer, its President and its Chief Financial Officer stating that (i) such officers have carefully examined the Registration Statement, the Pricing Disclosure Package, any Issuer Free Writing Prospectus and the Prospectus and, in their opinion, the Registration Statement and each amendment thereto, as of the Applicable Time and as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date) did not include any untrue statement of a material fact and did not omit to state a material fact required to be stated therein or necessary to make the statements therein not misleading, and the Pricing Disclosure Package, as of the Applicable Time and as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date), any Issuer Free Writing Prospectus as of its date and as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date), and the Prospectus and each amendment or supplement thereto, as of the respective date thereof and as of the Closing Date, did not include any untrue statement of a material fact and did not omit to state a material fact necessary in order to make the statements therein, in the light of the circumstances in which they were made, not misleading, (ii) since the effective date of the Registration Statement, no event has occurred which should have been set forth in a supplement or amendment to the Registration Statement, the Pricing Disclosure Package or the Prospectus, (iii) to the best of their knowledge after reasonable investigation, as of the Closing Date (or any Option Closing Date if such date is other than the Closing Date), the representations and warranties of the Company in this Agreement are true and correct and the Company has complied with all agreements and satisfied all conditions on its part to be performed or satisfied hereunder at or prior to the Closing Date (or any Option Closing Date if such date is other than the Closing Date), and (iv) there has not been, subsequent to the date of the most recent audited financial statements included or incorporated by reference in the Pricing Disclosure Package, any material adverse change in the financial position or results of operations of the Company, or any change or development that, singularly or in the aggregate, would involve a material adverse change or a prospective material adverse change, in or affecting the condition (financial or otherwise), results of operations, business, assets or prospects of the Company, except as set forth in the Prospectus.

4.4.2. Secretary's Certificate. At each of the Closing Date and the Option Closing Date, if any, the Representative shall have received a certificate of the Company signed by the Secretary of the Company, dated the Closing Date or the Option Date, as the case may be, respectively, certifying: (i) that each of the Charter and Bylaws is true and complete, has not been modified and is in full force and effect; (ii) that the resolutions of the Company's Board of Directors relating to the Offering are in full force and effect and have not been modified; (iii) as to the accuracy and completeness of all correspondence between the Company or its counsel and the Commission; and (iv) as to the incumbency of the officers of the Company. The documents referred to in such certificate shall be attached to such certificate.

4.5 No Material Changes. Prior to and on each of the Closing Date and each Option Closing Date, if any: (i) there shall have been no material adverse change or development involving a prospective material adverse change in the condition or prospects or the business activities, financial or otherwise, of the Company from the latest dates as of which such condition is set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus; (ii) no action, suit or proceeding, at law or in equity, shall have been pending or threatened against the Company or any Insider before or by any court or federal or state commission, board or other administrative agency wherein an unfavorable decision, ruling or finding may materially adversely affect the business, operations, prospects or financial condition or income of the Company, except as set forth in the Registration Statement, the Pricing Disclosure Package and the Prospectus; (iii) no stop order shall have been issued under the Securities Act and no proceedings therefor shall have been initiated or threatened by the Commission; and (iv) the Registration Statement,

the Pricing Disclosure Package and the Prospectus and any amendments or supplements thereto shall contain all material statements which are required to be stated therein in accordance with the Securities Act and the Securities Act Regulations and shall conform in all material respects to the requirements of the Securities Act and the Securities Act Regulations, and neither the Registration Statement, the Pricing Disclosure Package nor the Prospectus nor any amendment or supplement thereto shall contain any untrue statement of a material fact or omit to state any 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.

4.6 Delivery of Agreements.

4.6.1. Lock-Up Agreements. On or before the date of this Agreement, the Company shall have delivered to the Representative executed copies of the Lock-Up Agreements from each of the persons listed in Schedule 3 hereto.

4.6.2. Representative's Warrant Agreement . On the Closing Date, the Company shall have delivered to the Representative executed copies of the Representative's Warrant Agreement.

4.7 Additional Documents. At the Closing Date and at each Option Closing Date (if any) Representative Counsel shall have been furnished with such documents and opinions as they may require for the purpose of enabling Representative Counsel to deliver an opinion to the Underwriters, or in order to evidence the accuracy of any of the representations or warranties, or the fulfillment of any of the conditions, herein contained; and all proceedings taken by the Company in connection with the issuance and sale of the Public Securities and the Representative's Securities as herein contemplated shall be satisfactory in form and substance to the Representative and Representative Counsel.

4.8 Reverse Stock Split. Not later than the first trading day of the Firm Shares following the date hereof, the Reverse Stock Split shall be effective.

5. Indemnification.

5.1 Indemnification of the Underwriters.

5.1.1. General. Subject to the conditions set forth below, the Company agrees to indemnify and hold harmless each Underwriter, its affiliates and each of its and their respective directors, officers, members, employees, representatives and agents and each person, if any, who controls any such Underwriter within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act (collectively the "**Underwriter Indemnified Parties,**" and each an "**Underwriter Indemnified Party**"), against any and all loss, liability, claim, damage and expense whatsoever (including but not limited to any and all legal or other expenses reasonably incurred in investigating, preparing or defending against any litigation, commenced or threatened, or any claim whatsoever, whether arising out of any action between any of the Underwriter Indemnified Parties and the Company or between any of the Underwriter Indemnified Parties and any third party, or otherwise) to which they or any of them may become subject under the Securities Act, the Exchange Act or any other statute or at common law or otherwise or under the laws of foreign countries, arising out of or based upon any untrue statement or alleged untrue statement of a material fact contained in (i) the Registration Statement, the Pricing Disclosure Package, the Preliminary Prospectus, the Prospectus, any Issuer Free Writing Prospectus or any Written Testing-the-Waters Communication (as from time to time each may be amended and supplemented); (ii) any materials or information provided to investors by, or with the approval of, the Company in connection with the marketing of the Offering, including any "road show" or investor presentations made to investors by the Company (whether in person or electronically); or (iii) any application or other document or written communication (in this Section 5, collectively called "**application**") executed by the Company or based upon written information furnished by the Company in any jurisdiction in order to qualify the

Public Securities and Representative's Securities under the securities laws thereof or filed with the Commission, any state securities commission or agency, the Exchange or any other national securities exchange; or the omission or alleged omission therefrom of 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, unless such statement or omission was made in reliance upon, and in conformity with, the Underwriters' Information. With respect to any untrue statement or omission or alleged untrue statement or omission made in the Pricing Disclosure Package, the indemnity agreement contained in this Section 5.1.1 shall not inure to the benefit of any Underwriter Indemnified Party to the extent that any loss, liability, claim, damage or expense of such Underwriter Indemnified Party results from the fact that a copy of the Prospectus was not given or sent to the person asserting any such loss, liability, claim or damage at or prior to the written confirmation of sale of the Public Securities to such person as required by the Securities Act and the Securities Act Regulations, and if the untrue statement or omission has been corrected in the Prospectus, unless such failure to deliver the Prospectus was a result of non-compliance by the Company with its obligations under Section 3.3 hereof.

5.1.2. Procedure. If any action is brought against an Underwriter Indemnified Party in respect of which indemnity may be sought against the Company pursuant to Section 5.1.1, such Underwriter Indemnified Party shall promptly notify the Company in writing of the institution of such action and the Company shall assume the defense of such action, including the employment and fees of counsel (subject to the reasonable approval of such Underwriter Indemnified Party) and payment of actual expenses. Such Underwriter Indemnified Party shall have the right to employ its or their own counsel in any such case, but the fees and expenses of such counsel shall be at the expense of such Underwriter Indemnified Party unless (i) the employment of such counsel at the expense of the Company shall have been authorized in writing by the Company in connection with the defense of such action, or (ii) the Company shall not have employed counsel to have charge of the defense of such action, or (iii) such indemnified party or parties shall have reasonably concluded that there may be defenses available to it or them which are different from or additional to those available to the Company (in which case the Company shall not have the right to direct the defense of such action on behalf of the indemnified party or parties), in any of which events the reasonable fees and expenses of not more than one additional firm of attorneys selected by the Underwriter Indemnified Party (in addition to local counsel) shall be borne by the Company. Notwithstanding anything to the contrary contained herein, if any Underwriter Indemnified Party shall assume the defense of such action as provided above, the Company shall have the right to approve the terms of any settlement of such action, which approval shall not be unreasonably withheld.

5.2 Indemnification of the Company. Each Underwriter, severally and not jointly, agrees to indemnify and hold harmless the Company, its directors, its officers who signed the Registration Statement and persons who control the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act against any and all loss, liability, claim, damage and expense described in the foregoing indemnity from the Company to the several Underwriters, as incurred, but only with respect to untrue statements or omissions, or alleged untrue statements or omissions made in the Registration Statement, any Preliminary Prospectus, the Pricing Disclosure Package or Prospectus or any amendment or supplement thereto or in any application, in reliance upon, and in strict conformity with, the Underwriters' Information. In case any action shall be brought against the Company or any other person so indemnified based on any Preliminary Prospectus, the Registration Statement, the Pricing Disclosure Package or Prospectus or any amendment or supplement thereto or any application, and in respect of which indemnity may be sought against any Underwriter, such Underwriter shall have the rights and duties given to the Company, and the Company and each other person so indemnified shall have the rights and duties given to the several Underwriters by the provisions of Section 5.1.2. The Company agrees promptly to notify the Representative of the commencement of any litigation or proceedings against the Company or any of its officers, directors or any person, if any, who controls the Company within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act, in connection with the issuance and sale of the Public Securities or in connection with the Registration

Statement, the Pricing Disclosure Package, the Prospectus, any Issuer Free Writing Prospectus or any Written Testing-the-Waters Communication.

5.3 Contribution.

5.3.1. Contribution Rights. If the indemnification provided for in this Section 5 shall for any reason be unavailable to or insufficient to hold harmless an indemnified party under Section 5.1 or 5.2 in respect of any loss, claim, damage or liability, or any action in respect thereof, referred to therein, then each indemnifying party shall, in lieu of indemnifying such indemnified party, contribute to the amount paid or payable by such indemnified party as a result of such loss, claim, damage or liability, or action in respect thereof, (i) in such proportion as shall be appropriate to reflect the relative benefits received by the Company, on the one hand, and the Underwriters, on the other, from the Offering of the Public 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, with respect to the statements or omissions that resulted in such loss, claim, damage or liability, or action in respect thereof, 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, with respect to such Offering shall be deemed to be in the same proportion as the total net proceeds from the Offering of the Public Securities purchased under this Agreement (before deducting expenses) received by the Company, as set forth in the table on the cover page of the Prospectus, on the one hand, and the total underwriting discounts and commissions received by the Underwriters with respect to the shares of the Common Stock purchased under this Agreement, as set forth in the table on the cover page of the Prospectus, on the other hand. The relative fault shall be determined by reference to whether the untrue or alleged untrue statement of a material fact or omission or alleged omission to state a material fact relates to information supplied by the Company or the Underwriters, the intent of the parties and their relative knowledge, access to information and opportunity to correct or prevent such statement or omission. The Company and the Underwriters agree that it would not be just and equitable if contributions pursuant to this Section 5.3.1 were to be determined by pro rata allocation (even if the Underwriters were treated as one entity for such purpose) or by any other method of allocation that does not take into account the equitable considerations referred to herein. The amount paid or payable by an indemnified party as a result of the loss, claim, damage or liability, or action in respect thereof, referred to above in this Section 5.3.1 shall be deemed to include, for purposes of this Section 5.3.1, any legal or other expenses reasonably incurred by such indemnified party in connection with investigating or defending any such action or claim. Notwithstanding the provisions of this Section 5.3.1 in no event shall an Underwriter be required to contribute any amount in excess of the amount by which the total underwriting discounts and commissions received by such Underwriter with respect to the Offering of the Public Securities exceeds the amount of any damages that such Underwriter has otherwise been required to pay by reason of such untrue or alleged untrue statement or omission or alleged omission. 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.

5.3.2. Contribution Procedure. Within fifteen (15) days after receipt by any party to this Agreement (or its representative) of notice of the commencement of any action, suit or proceeding, such party will, if a claim for contribution in respect thereof is to be made against another party ("contributing party"), notify the contributing party of the commencement thereof, but the failure to so notify the contributing party will not relieve it from any liability which it may have to any other party other than for contribution hereunder. In case any such action, suit or proceeding is brought against any party, and such party notifies a contributing party or its representative of the commencement thereof within the aforesaid 15 days, the contributing party will be entitled to participate therein with the notifying party and any other contributing party similarly notified. Any such contributing party shall not be liable to any party seeking contribution on account of any settlement of any claim, action or

proceeding affected by such party seeking contribution on account of any settlement of any claim, action or proceeding affected by such party seeking contribution without the written consent of such contributing party. The contribution provisions contained in this Section 5.3.2 are intended to supersede, to the extent permitted by law, any right to contribution under the Securities Act, the Exchange Act or otherwise available. Each Underwriter's obligations to contribute pursuant to this Section 5.3 are several and not joint.

6. Default by an Underwriter.

6.1 Default Not Exceeding 10% of Firm Shares or Option Shares. If any Underwriter or Underwriters shall default in its or their obligations to purchase the Firm Shares or the Option Shares, if the Over-allotment Option is exercised hereunder, and if the number of the Firm Shares or Option Shares with respect to which such default relates does not exceed in the aggregate 10% of the number of Firm Shares or Option Shares that all Underwriters have agreed to purchase hereunder, then such Firm Shares or Option Shares to which the default relates shall be purchased by the non-defaulting Underwriters in proportion to their respective commitments hereunder.

6.2 Default Exceeding 10% of Firm Shares or Option Shares. In the event that the default addressed in Section 6.1 relates to more than 10% of the Firm Shares or Option Shares, you may in your discretion arrange for yourself or for another party or parties to purchase such Firm Shares or Option Shares to which such default relates on the terms contained herein. If, within one (1) Business Day after such default relating to more than 10% of the Firm Shares or Option Shares, you do not arrange for the purchase of such Firm Shares or Option Shares, then the Company shall be entitled to a further period of one (1) Business Day within which to procure another party or parties satisfactory to you to purchase said Firm Shares or Option Shares on such terms. In the event that neither you nor the Company arrange for the purchase of the Firm Shares or Option Shares to which a default relates as provided in this Section 6, this Agreement will automatically be terminated by you or the Company without liability on the part of the Company (except as provided in Sections 3.9 and 5 hereof) or the several Underwriters (except as provided in Section 5 hereof); provided, however, that if such default occurs with respect to the Option Shares, this Agreement will not terminate as to the Firm Shares; and provided, further, that nothing herein shall relieve a defaulting Underwriter of its liability, if any, to the other Underwriters and to the Company for damages occasioned by its default hereunder.

6.3 Postponement of Closing Date. In the event that the Firm Shares or Option Shares to which the default relates are to be purchased by the non-defaulting Underwriters, or are to be purchased by another party or parties as aforesaid, you or the Company shall have the right to postpone the Closing Date or Option Closing Date for a reasonable period, but not in any event exceeding five (5) Business Days, in order to effect whatever changes may thereby be made necessary in the Registration Statement, the Pricing Disclosure Package or the Prospectus or in any other documents and arrangements, and the Company agrees to file promptly any amendment to the Registration Statement, the Pricing Disclosure Package or the Prospectus that in the opinion of counsel for the Underwriter may thereby be made necessary. The term "**Underwriter**" as used in this Agreement shall include any party substituted under this Section 6 with like effect as if it had originally been a party to this Agreement with respect to such shares of Common Stock.

7. Additional Covenants.

7.1 Board Composition and Board Designations. The Company shall ensure that: (i) the qualifications of the persons serving as members of the Board of Directors and the overall composition of the Board comply with the Sarbanes-Oxley Act, with the Exchange Act and with the listing rules of the Exchange or any other national securities exchange, as the case may be, in the event the Company seeks to have its Public Securities listed on another exchange or quoted on an automated quotation system, and

(ii) if applicable, at least one member of the Audit Committee of the Board of Directors qualifies as an "audit committee financial expert," as such term is defined under Regulation S-K and the listing rules of the Exchange.

7.2 Prohibition on Press Releases and Public Announcements. The Company shall not issue press releases or engage in any other publicity, without the Representative's prior written consent, for a period ending at 5:00 p.m., Eastern time, on the first (1st) Business Day following the forty-fifth (45th) day after the Closing Date, other than normal and customary releases issued in the ordinary course of the Company's business.

7.3 Right of First Refusal. Provided that the Firm Shares are sold in accordance with the terms of this Agreement, the Representative shall have an irrevocable right of first refusal (the "**Right of First Refusal**"), for a period of twelve (12) months after the Effective Date, to act as lead or managing underwriter, exclusive placement agent, exclusive financial advisor or in any other similar capacity, on the Representative's customary terms and conditions, in the event the Company or any Subsidiary retains or otherwise uses (or seeks to retain or use) the services of an investment bank or similar financial advisor to pursue a registered, underwritten public offering of securities (in addition to the Offering), a private placement of securities, a merger, acquisition of another company or business, change of control, sale of substantially all assets or other similar transaction (regardless of whether the Company would be considered an acquiring party, a selling party or neither in such transaction) (each, a "**Subject Transaction**"). The Company shall notify the Representative of its intention to pursue a Subject Transaction, including the material terms thereof, by providing written notice thereof by registered mail or overnight courier service addressed to the Representative. If the Representative fails to exercise its Right of First Refusal with respect to any Subject Transaction within ten (10) Business Days after the mailing of such written notice, then the Representative shall have no further claim or right with respect to the Subject Transaction. The Representative may elect, in its sole and absolute discretion, not to exercise its Right of First Refusal with respect to any Subject Transaction; *provided* that any such election by the Representative shall not adversely affect the Representative's Right of First Refusal with respect to any other Subject Transaction. The terms and conditions of any such engagements shall be set forth in separate agreements and may be subject to, among other things, satisfactory completion of due diligence by the Representative, market conditions, the absence of a material adverse change to the Company's business, financial condition and prospects, approval of the Representative's internal committee and any other conditions that the Representative may deem appropriate for transactions of such nature. Notwithstanding the foregoing, in the event the Subject Transaction involves a public or private sale of securities, the Representative shall be entitled to receive as its compensation at least 50% of the compensation payable to the underwriting or placement agent group when serving as co-manager or co-placement agent and at least 33% of the compensation payable to the underwriting or placement agent group when serving as co-manager or co-placement agent with respect to a proposed financing in which there are three co-managing or lead underwriters or co-placement agents.

8. Effective Date of this Agreement and Termination Thereof.

8.1 Effective Date. This Agreement shall become effective when both the Company and the Representative have executed the same and delivered counterparts of such signatures to the other party.

8.2 Termination. The Representative shall have the right to terminate this Agreement at any time prior to any Closing Date, (i) if any domestic or international event or act or occurrence has materially disrupted, or in your opinion will in the immediate future materially disrupt, general securities markets in the United States; or (ii) if trading on the New York Stock Exchange or the Nasdaq Stock Market LLC shall have been suspended or materially limited, or minimum or maximum prices for trading shall have been fixed, or maximum ranges for prices for securities shall have been required by FINRA or by order of the Commission or any other government authority having jurisdiction; or (iii) if the United

States shall have become involved in a new war or an increase in major hostilities; or (iv) if a banking moratorium has been declared by a New York State or federal authority; or (v) if a moratorium on foreign exchange trading has been declared which materially adversely impacts the United States securities markets; or (vi) if the Company shall have sustained a material loss by fire, flood, accident, hurricane, earthquake, theft, sabotage or other calamity or malicious act which, whether or not such loss shall have been insured, will, in your opinion, make it inadvisable to proceed with the delivery of the Firm Shares or Option Shares; or (vii) if the Company is in material breach of any of its representations, warranties or covenants hereunder; or (viii) if the Representative shall have become aware after the date hereof of such a material adverse change in the conditions or prospects of the Company, or such adverse material change in general market conditions as in the Representative's judgment would make it impracticable to proceed with the offering, sale and/or delivery of the Public Securities or to enforce contracts made by the Underwriters for the sale of the Public Securities.

8.3 Expenses. Notwithstanding anything to the contrary in this Agreement, except in the case of a default by the Underwriters, pursuant to Section 6.2 above, in the event that this Agreement shall not be carried out for any reason whatsoever, within the time specified herein or any extensions thereof pursuant to the terms herein, the Company shall be obligated to pay to the Underwriters their actual and accountable out-of-pocket expenses related to the transactions contemplated herein then due and payable (including the fees and disbursements of Representative Counsel) up to $75,000, inclusive of the $25,000 advance for non-accountable expenses previously paid by the Company to the Representative (the "**Advance**") and upon demand the Company shall pay the full amount thereof to the Representative on behalf of the Underwriters; provided, however, that such expense cap in no way limits or impairs the indemnification and contribution provisions of this Agreement. Notwithstanding the foregoing, any advance received by the Representative will be reimbursed to the Company to the extent not actually incurred in compliance with FINRA Rule 5110(f)(2)(C).

8.4 Indemnification. Notwithstanding any contrary provision contained in this Agreement, any election hereunder or any termination of this Agreement, and whether or not this Agreement is otherwise carried out, the provisions of Section 5 shall remain in full force and effect and shall not be in any way affected by, such election or termination or failure to carry out the terms of this Agreement or any part hereof.

8.5 Representations, Warranties, Agreements to Survive. All representations, warranties and agreements contained in this Agreement or in certificates of officers of the Company submitted pursuant hereto, shall remain operative and in full force and effect regardless of (i) any investigation made by or on behalf of any Underwriter or its Affiliates or selling agents, any person controlling any Underwriter, its officers or directors or any person controlling the Company or (ii) delivery of and payment for the Public Securities.

9. Miscellaneous.

9.1 Notices. All communications hereunder, except as herein otherwise specifically provided, shall be in writing and shall be mailed (registered or certified mail, return receipt requested), personally delivered or sent by facsimile transmission and confirmed and shall be deemed given when so delivered or faxed and confirmed or if mailed, two (2) days after such mailing.

If to the Representative:

Aegis Capital Corp.
810 Seventh Avenue, 18th Floor
New York, New York 10019
Attn: Mr. David Bocchi, Managing Director of Investment Banking
Fax No.: (212) 813-1047

with a copy (which shall not constitute notice) to:

Reed Smith LLP
599 Lexington Avenue
New York, NY 10022
Attn: Yvan-Claude Pierre, Esq.
Fax No.: 212-521-5450

If to the Company:

Heat Biologics, Inc.
100 Europa Drive
Chapel Hill, North Carolina 27517
Attention: Jeffrey Wolf, Chief Executive Officer
Fax No: [•]

with a copy (which shall not constitute notice) to:

Gracin & Marlow, LLP
Chrysler Building
405 Lexington Avenue, 26th Floor
New York, New York 10174
Attention: Leslie Marlow, Esq.
Fax No: (212) 208-4657

9.2 Headings. The headings contained herein are for the sole purpose of convenience of reference, and shall not in any way limit or affect the meaning or interpretation of any of the terms or provisions of this Agreement.

9.3 Amendment. This Agreement may only be amended by a written instrument executed by each of the parties hereto.

9.4 Entire Agreement. This Agreement (together with the other agreements and documents being delivered pursuant to or in connection with this Agreement) constitutes the entire agreement of the parties hereto with respect to the subject matter hereof and thereof, and supersedes all prior agreements and understandings of the parties, oral and written, with respect to the subject matter hereof. Notwithstanding anything to the contrary set forth herein, it is understood and agreed by the parties hereto that all other terms and conditions of that certain engagement letter between the Company and Aegis Capital Corp., dated February 7, 2013 and amended [•], 2013, shall remain in full force and effect.

9.5 Binding Effect. This Agreement shall inure solely to the benefit of and shall be binding upon the Representative, the Underwriters, the Company and the controlling persons, directors and officers referred to in Section 5 hereof, and their respective successors, legal representatives, heirs and assigns, and no other person shall have or be construed to have any legal or equitable right, remedy or

claim under or in respect of or by virtue of this Agreement or any provisions herein contained. The term "successors and assigns" shall not include a purchaser, in its capacity as such, of securities from any of the Underwriters.

9.6 Governing Law; Consent to Jurisdiction; Trial by Jury . This Agreement shall be governed by and construed and enforced in accordance with the laws of the State of New York, without giving effect to conflict of laws principles thereof. The Company hereby agrees that any action, proceeding or claim against it arising out of, or relating in any way to this Agreement shall be brought and enforced in the New York Supreme Court, County of New York, or in the United States District Court for the Southern District of New York, and irrevocably submits to such jurisdiction, which jurisdiction shall be exclusive. The Company hereby waives any objection to such exclusive jurisdiction and that such courts represent an inconvenient forum. Any such process or summons to be served upon the Company may be served by transmitting a copy thereof by registered or certified mail, return receipt requested, postage prepaid, addressed to it at the address set forth in Section 9.1 hereof. Such mailing shall be deemed personal service and shall be legal and binding upon the Company in any action, proceeding or claim. The Company agrees that the prevailing party(ies) in any such action shall be entitled to recover from the other party(ies) all of its reasonable attorneys' fees and expenses relating to such action or proceeding and/or incurred in connection with the preparation therefor. The Company (on its behalf and, to the extent permitted by applicable law, on behalf of its stockholders and affiliates) and each of the Underwriters hereby irrevocably waives, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Agreement or the transactions contemplated hereby.

9.7 Execution in Counterparts. This Agreement may be executed in one or more counterparts, and by the different parties hereto in separate counterparts, each of which shall be deemed to be an original, but all of which taken together shall constitute one and the same agreement, and shall become effective when one or more counterparts has been signed by each of the parties hereto and delivered to each of the other parties hereto. Delivery of a signed counterpart of this Agreement by facsimile or email/pdf transmission shall constitute valid and sufficient delivery thereof.

9.8 Waiver, etc. The failure of any of the parties hereto to at any time enforce any of the provisions of this Agreement shall not be deemed or construed to be a waiver of any such provision, nor to in any way effect the validity of this Agreement or any provision hereof or the right of any of the parties hereto to thereafter enforce each and every provision of this Agreement. No waiver of any breach, non-compliance or non-fulfillment of any of the provisions of this Agreement shall be effective unless set forth in a written instrument executed by the party or parties against whom or which enforcement of such waiver is sought; and no waiver of any such breach, non-compliance or non-fulfillment shall be construed or deemed to be a waiver of any other or subsequent breach, non-compliance or non-fulfillment.

[*Signature Page Follows*]

If the foregoing correctly sets forth the understanding between the Underwriters and the Company, please so indicate in the space provided below for that purpose, whereupon this letter shall constitute a binding agreement between us.

Very truly yours,

HEAT BIOLOGICS, INC.

By: _____
Name:
Title:

Confirmed as of the date first written above mentioned, on behalf of itself and as Representative of the several Underwriters named on Schedule 1 hereto:

AEGIS CAPITAL CORP.

By: _____
Name:
Title:

SCHEDULE 1

Underwriter	Total Number of Firm Shares to be Purchased	Number of Additional Shares to be Purchased if the Over-Allotment Option is Fully Exercised
Aegis Capital Corp.		
Cantor Fitzgerald & Co.		
TOTAL		

SCHEDULE 2-A
Pricing Information

Number of Firm Shares: [•]

Number of Option Shares: [•]

Public Offering Price per Share: $[•]

Underwriting Discount per Share: $[•]

Underwriting Non-accountable expense allowance per Share: $[•]

Proceeds to Company per Share (before expenses): $[•]

SCHEDULE 2-B

Issuer General Use Free Writing Prospectuses

[ ]

SCHEDULE 2-C]

Written Testing-the-Waters Communications

[ ]

Exhibit 3.6

CERTIFICATE OF AMENDMENT
OF THE
THIRD AMENDED AND RESTATED
CERTIFICATE OF INCORPORATION
OF
HEAT BIOLOGICS, INC.

Heat Biologics, Inc., a corporation organized and existing under the laws of the State of Delaware (the "Corporation"), does hereby certify:

1. The name of the Corporation is "Heat Biologics, Inc." The original Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on June 10, 2008, the First Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on October 16, 2009, the Second Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on December 16, 2011, and the Third Amended and Restated Certificate of Incorporation was filed with the Secretary of State of the State of Delaware on March 21, 2013 (the "Third Amended and Restated Certificate of Incorporation").

2. The Board of Directors of the Corporation has duly adopted a resolution pursuant to Section 242 of the General Corporation Law of the State of Delaware setting forth a proposed amendment to the Third Amended and Restated Certificate of Incorporation of the Corporation and declaring said amendment to be advisable. The requisite stockholders of the Corporation have duly approved said proposed amendment in accordance with Section 242 and Section 228 of the General Corporation Law of the State of Delaware. The amendment amends the Third Amended and Restated Certificate of Incorporation of the Corporation as follows:

Article IV is hereby amended by deleting the first paragraph of Article IV and replacing such paragraph with the following two paragraphs:

"The total number of shares of all classes of capital stock which the Corporation is authorized to issue is 60,000,000 shares, consisting of 50,000,000 shares of common stock, par value $0.0002 per share (the ***"Common Stock"),*** and 10,000,000 shares of preferred stock, par value $0.0001 per share (the ***"Preferred Stock").***

"Effective upon the effective time of this Certificate of Amendment of the Third Amended and Restated Certificate of Incorporation with the Secretary of State of the State of Delaware (the "**Split Effective Time**"), the shares of Common Stock issued and outstanding immediately prior to the Split Effective Time and the shares of Common Stock issued and held in the treasury of the Corporation immediately prior to the Split Effective Time are reclassified into a smaller number of shares such that every 2.3 shares of issued Common Stock immediately prior to the Split Effective Time are reclassified into one (1) share of Common Stock. Notwithstanding the foregoing, no fractional shares of Common Stock shall be issued as a result of the reclassification and any fraction of a share of Common Stock that would otherwise have resulted from the foregoing stock split will be eliminated by rounding such fraction up to the nearest whole share. Each stock certificate that, immediately prior to the Split Effective Time, represented shares of Common Stock that were issued and outstanding immediately prior to the Split Effective Time shall, from and after the Split Effective Time, automatically and without the necessity of presenting the same for exchange, represent that number of whole shares of Common Stock after the Split Effective Time into which the shares of Common Stock formerly represented by such certificate shall have been reclassified, provided, however, that each person of record holding a certificate that represented shares of Common Stock that were issued and outstanding immediately prior to the Split Effective Time shall receive, upon surrender of such certificate, a new certificate evidencing and representing the number of whole shares of Common Stock after the Split Effective

Time into which the shares of Common Stock formerly represented by such certificate shall have been reclassified."

3. This Certificate of Amendment shall be effective May 29, 2013 at 5:00 P.M. Eastern Time.

4. All other sections in Article IV shall remain the same.

IN WITNESS WHEREOF, the Corporation has caused this Certificate of Amendment to the Certificate of Incorporation to be signed by Jeffrey Wolf, its President, this 29th day of May, 2013.

HEAT BIOLOGICS, INC.

By: /s/ Jeffrey Wolf

Jeffrey Wolf, President

THIS WARRANT AND THE UNDERLYING SECURITIES HAVE NOT BEEN REGISTERED UNDER THE SECURITIES ACT OF 1933. THEY MAY NOT BE SOLD, OFFERED FOR SALE, PLEDGED OR HYPOTHECATED IN THE ABSENCE OF AN EFFECTIVE REGISTRATION STATEMENT AS TO SUCH SECURITIES UNDER SAID ACT OR AN OPINION OF COUNSEL THAT SUCH REGISTRATION IS NOT REQUIRED.

STOCK WARRANT

Issue Date: December 14, 2011 Expiration Date: December 13, 2021

THIS CERTIFIES that, for value received,, the North Carolina Biotechnology Center (the "Center") is entitled to subscribe for and purchase from Heat Biologics, Inc. (the "Company"), 29.762 shares of the Company's Series A Preferred Stock (the "Shares"), subject to adjustment as set forth herein, at a price per Share of $2.10, subject to adjustment as set forth herein (the "Exercise Price").

Section 1 ***Method of Exercise and Expiration***

1.1 **Term and Expiration**. Subject to the terms and conditions set forth in this Warrant, this Warrant may be exercised in whole or in part at any time and from time to time from the date hereof through the Expiration Date (The "Exercise Period"). If this Warrant is exercised in part from time to time during the Exercise Period, it shall be exercised in minimum quantities of Shares equal to 100 shares (or such lesser number of shares which may then constitute the maximum number purchasable; such number being subject to adjustment as set forth herein).

1.2 **Deliverables by the Center Upon Exercise**. This Warrant shall be exercised by delivery of the following to the Company at the address of the Company in the Center's records, Attention: President / CEO (or at such other agency or office of the Company as it may designate by notice in writing to the Center at the address of the Center appearing in the books of the Company):

(a) an executed Notice of Exercise in the form attached hereto asExhibit A;

(b) payment of the Exercise Price for the aggregate amount of Shares being purchased (i) in cash or cashier's check, (ii) by cancellation by the Center of indebtedness or other obligations of the Company to the Center, (iii) by a combination of (i) and (ii) or (iv) pursuant to Section 1.4 below; and

(c) this Warrant.

1.3 **Deliverables by the Company Upon Exercise**. In the event of any exercise of the rights represented by this Warrant, a certificate or certificates for the Shares so purchased, registered in the name of the person or entity entitled to receive the same, shall be delivered to the Center within thirty (30) days (or such later time agreed to in writing by the Center) after the rights represented by this Warrant shall have been so exercised; provided, that if the Company does not customarily issue share certificates, an appropriate and binding entry in the stock ledger

of the Company may be made in lieu of the certificates called for by this Section 1.3 and the Company shall deliver to the Center a copy of such stock ledger certified by an appropriate officer of the Company. Unless this Warrant has expired or been fully exercised, a new warrant representing the Shares, if any, with respect to which this Warrant shall not then have been exercised shall also be issued to the Center within such time, containing the same terms and conditions specified herein. The person or entity in whose name any certificate or certificates for Shares are to be issued upon exercise of this Warrant shall for all purposes be deemed to have become the holder of record of such Shares on the date on which this Warrant was surrendered and payment of the Exercise Price was made, irrespective of the date of delivery or such certificate or certificates, except that, if the date of such surrender and payment is a date when the stock transfer books of the Company are closed, such person or entity shall be deemed to have become the holder of record of such Shares at the close of business on the next succeeding date on which the stock transfer books are open.

1.4 **Net Issue Exercise**. Notwithstanding any provisions herein to the contrary, if the fair market value of one (1) Share is greater than the Exercise Price (at the date of calculation as set forth below), in lieu of exercising this Warrant for cash, the Center may elect to receive shares equal to the value (as determined below) of this Warrant (or the portion thereof being exercised) (such election being referred to herein as a "Net Issue Exercise Election") by surrender of this Warrant at the principal office of the Company together with the properly endorsed Notice of Exercise and notice of such election in which event the company shall issue to Center a number of Shares computed using the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where X = the number of Shares to be issued to the Center.

Y = the number of Shares purchasable under this Warrant or, if only a portion of the Warrant is being exercised, the portion of the Warrant being exercised.

A = the "fair market value" (as defined below) of one (1) Share

B = the Exercise Price per Share (as adjusted to the date of such calculation).

For purposes of this Section 1.4, the fair market value per Share shall be the product of (i) the average of the closing bid and asked prices of the Shares quoted in any applicable over the counter market summary or the last reported sale price of the Shares or the average closing price quoted on any exchange on which the Shares are listed, whichever is applicable, for thirty (30) trading days prior to the date of determination of fair market value and (ii) the number of Shares into which each Share is convertible at the time of such exercise. If the Shares are not traded over the counter or on an exchange, the fair market value shall be the price per Share which the Company could obtain from a willing buyer for Shares sold by the Company from authorized but unissued shares, as such price shall be agreed in good faith by the Company and the Center. If the Company and the Center are unable to agree on the "fair market value" of the Shares within

ten (10) days of receipt of the Notice of Exercise required under Section 1.2(a) above, then the fair market value shall be determined by an independent valuation expert selected by the Company and reasonably acceptable to the Center. Notwithstanding the foregoing, in the event the Warrant is exercised in connection with the Company's initial public offering of Shares, the fair market value per Share shall be the product of (i) the per Share offering price to the public of the Company's initial public offering, and (ii) the number of Shares into which each Share is convertible at the time of exercise.

In the event that the Center makes a Net Issue Exercise Election pursuant to this Section 1.4, the provisions of Section 1.2 regarding certain delivery obligations of the Center, and Section 1.3 regarding certain delivery obligations of the Company, shall be fully applicable upon such election.

Section 2. ***Representations and Warranties of Company***

2.1 **Organization**. The Company is duly organized, validly existing and in good standing under the laws of the jurisdiction in which it is incorporated and is duly qualified and is in good standing as a foreign Company in those jurisdictions where the conduct of its business or ownership of its property requires qualification. The Company has the corporate power to carry out the business in which it is engaged.

2.2 **Valid Obligation**. The execution and delivery of this Warrant and any related documents have been duly authorized by all necessary action of the Board of Directors and shareholders of the Company under applicable law, and are not and will not be in contravention of any provision of law, nor in contravention of any certificate of authority, bylaw or other applicable corporate documents of the Company, nor result in the breach of any agreement, indenture or undertaking to which the Company is a party or by which it is bound.

2.3 **Shares**. All shares which may be issued upon the exercise of the rights represented by this Warrant will, upon issuance, be validly issued and outstanding, fully paid and nonassessable, with no personal liability attaching to the ownership thereof, and free from all taxes, liens and charges with respect to the issuance thereof.

Section 3. ***Covenants of Company***.

3.1 **Covenants as to Shares**. The Company covenants and agrees that the company shall authorize and reserve a sufficient number of Shares to provide for all permitted exercises of the rights represented by this Warrant. If at any time the number of authorized but unissued Shares shall not be sufficient to effect any permitted exercise of this Warrant, the Company shall take such corporate action as may, in the opinion of its counsel, be necessary to increase its authorized but unissued Shares to such number of shares as shall be sufficient for such purposes. The Company shall give the Center at least thirty (30) days prior written notice of the filing of a registration statement under the Securities Act of 1933, as amended (the "Act"), covering the offering and sale of the Company's securities.

3.2 **No Impairment**. Except and to the extent waived or consented to by the Center in writing, the Company will not, by amendment of its charter or through any reorganization, transfer of assets, consolidation, merger, dissolution, issue or sale of securities of any other

action, avoid or seek to avoid the observance or performances of any of the terms to be observed or performed hereunder by the Company, but will at all times in good faith assist in the carrying out of all the provisions in this Warrant and in the taking of all such action as may be necessary or appropriate in order to protect from impairment the rights of the Center to purchase the Shares hereunder.

3.3 **Notice of Record Date**. In the event the company establishes a record date in order to determine the holders of any class of securities of the Company as of such record date: (i) for the purpose of determining the holders thereof who are entitled to receive any dividend (other than a cash dividend which is the same as cash dividends paid in the previous two (2) quarters) or any other distribution as regards any securities of the Company (whether in cash, in securities, or pursuant to any spin-off, split-off or distribution of the Company's assets); (ii) for the purpose of entitling them to subscribe for or purchase any shares of any class of securities or to receive any other rights; (iii) for any classification, reclassification, or other reorganization of the securities which the Company is now or hereafter authorized to issue, the consolidation or merger of the Company with or into another Company, or the conveyance of all or substantially all of the assets of the Company; or (iv) for a voluntary or involuntary dissolution, liquidation or winding up of the Company; then, the Company shall provide written notice to the Center, at least thirty (30) days prior to the proposed record dates, specifying the record date.

3.4 **Adjustment Due to Change in Number of Outstanding Shares**. In any of the following events (each a "Triggering Event"), appropriate adjustment shall be made in the number of Shares which may be purchased by the Center upon the exercise of this Warrant, or in the Exercise Price per Share to be paid, so as to maintain the proportional interest of the Center in the ownership, on a fully diluted basis, of the Company, as follows:

(a) If the Company shall at any time subdivide any class of its equity securities by split-up or otherwise, or combine its outstanding equity securities, or issue additional shares of its equity securities in payment of a dividend in respect of its equity securities, the number of Shares underlying this Warrant shall be proportionately increased and the Exercise Price proportionately decreased in the case of a subdivision or stock dividend, and the number of Shares underlying this Warrant shall be proportionately decreased and the Exercise Price proportionally increased in the case of a combination.

(b) In case of any reclassification or change of the outstanding equity securities of the Company (other than as a result of a subdivision, combination or dividend), or in case of any consolidation of the Company with, or merger of the Company into, another company or other business organization (other than a consolidation or merger in which the Company is the continuing Company and which does not result in any reclassification or change of the outstanding equity securities of the Company or in the issuance of any other securities of the Company), or in case of any sale or conveyance to another Company or other business organization of the property of the Company as an entirety or substantially as an entirety, then the Center or other holder of this Warrant shall have the right to acquire the kind and amount of shares of capital stock and other securities and property receivable upon such reclassification, change, consolidation, merger, sale or conveyance by a holder of the number of Shares of the Company which might have been acquired by the Center upon exercise of this Warrant immediately prior to such reclassification, change, consolidation, merger, sale or conveyance

(c) If the Company shall, after the date hereof, at any time or from time to time issue or is deemed to have been issued (as defined below), any Shares for a purchase price per Share less than the then-current Exercise Price, then the Exercise Price shall immediately be reduced to the price determined using the following formula, on a fully diluted basis:

$$X = \frac{((A \times B) + C)}{Y}$$

Where X = the reduced Exercise Price

A = the number of Shares outstanding or deemed outstanding immediately prior to such issuance.

B = the Exercise Price in effect immediately prior to such issuance.

C = the aggregate fair value of the consideration, if any, received or receivable by the Company upon each and every issuance or deemed issuance of additional Shares (including without limitation consideration receivable upon the issuance of securities underlying any other securities).

Y = the aggregate number of Shares outstanding or deemed outstanding immediately after such issuance.

Upon termination or rights to purchase or acquire Shares, by lapse or otherwise, the shares theretofore issuable, but not issued, shall cease to be included in the formula set forth above, and the Exercise Price shall be readjusted to reflect such termination. Notwithstanding the foregoing, there shall be no adjustment to the Exercise Price or the number of Shares obtainable upon exercise of this Warrant with respect to a Permitted Issuance. A “Permitted Issuance” means (i) the granting of options to purchase Shares, or other stock-based benefits, to employees, directors or consultants of the Company or the exercise thereof, pursuant to any reservation under any employee benefit plan to the extent and as in effect on the date of this Warrant, or approved thereafter by the Board of Directors of the Company, in an aggregate amount not to exceed five percent (5%) of the Shares deemed outstanding s of the date hereof, or (ii) the issuance of Shares pursuant to the exercise of options, convertible equity securities, or other rights to acquire Shares that are outstanding on the date of this Warrant.

For purposes of this Warrant, additional Shares shall be “deemed to have been issued”, “deemed issued”, or “deemed outstanding”, if the Company shall at any time issue any of its Shares or other securities, or other rights, warrants, or options to subscribe for or purchase Shares of other securities, which, in any such case, ranks at an equal priority with the Shares, or which includes an option to acquire or a right to convert to Shares or other securities ranking at an equal priority with the Shares at a price per share after such acquisition or conversion less than the Exercise Price.

Upon any Triggering Event, adequate provision shall be made whereby the Center or other holder of this Warrant shall have the right to receive and acquire (upon exercise of this Warrant)

such Shares, securities, cash, or other property as would have been issuable or payable (as part of the Triggering Event) with respect to or in exchange for such number of outstanding Shares as would have been received had this Warrant been exercised immediately prior to such Triggering Event (as set for more specifically above), and the number of shares reserved by the Company for purposes of this Warrant shall be adjusted by the same proportion. In the event of a proportional adjustment under subparagraphs (a), (b) or (c) or this Section 3.4, no adjustment shall be made in the aggregate purchase price of the Shares then covered by this Warrant, and the per-share Exercise Price shall be adjusted accordingly. All such adjustments shall be made by the Company, whose determination upon the same shall be subject to review and approval by the Center. No fractional Shares shall be issued; and any fractional Share resulting from the computations pursuant to this Section 3.4 shall be rounded up to the next whole share. The Company shall provide thirty (30) days' prior written notice to the Center of a Triggering Event (to the extent legally permissible, but in no case later than five (5) days after the occurrence of a Triggering Event), its effective date, and the proposed adjustment for such Triggering Event.

Section 4. ***Shareholder Rights***. Until the valid exercise of this Warrant, the Center shall not be entitled to any rights of a stockholder with regard to the Shares, but immediately upon the exercise of this Warrant and upon payment of the Exercise Price as provided herein, the Center shall be deemed to be a record holder of the Company's Shares. Notwithstanding the foregoing, and provided the Center agrees in a manner reasonably satisfactory to the Company to maintain in confidence and confidential and proprietary information of the Company, the Company shall provide financial and operating information regarding the Company to the Center annually. In addition, the Center may request financial and operating information regarding the Company with thirty (30) days after its receipt of the each of the notices the Company is required to provide pursuant to Sections 3.3 and 3.4 above.

Section 5. ***Transfer of Warrant***

5.1 **Transfer**. Subject to compliance with applicable state and federal securities laws, and the terms of this Warrant, this Warrant shall be transferable, in whole or in part, by the Center or other holder of record upon surrender of this Warrant properly endorsed.

5.2 **Transferee Obligations**. Any transferee shall represent and warrant to the Company that it will hold this Warrant (or any portion thereof) subject to the provisions and upon the conditions specified herein.

5.3 **New Warrants**. On any transfer referenced in this Section 5, the Company shall issue (as applicable) a new Warrant or Warrants to the transferee (who shall then become a holder of record for all purposes under the terms of this Warrant) and to the Center (in the event the Warrant is only partially transferred) containing the same terms and conditions specified herein. The surrendered Warrant shall thereafter be canceled. Each such transferee shall succeed to all of the rights and assume all obligations of the Center under this Warrant.

Section 6. ***Lost, Stolen, Mutilated or Destroyed Warrant***. If this Warrant is lost, stolen, mutilated, or destroyed, the Company shall, on delivery of an indemnity agreement reasonably satisfactory to the Company (and, in the case of a mutilated Warrant, the surrender thereof), issue a new Warrant of like denomination and tenor as the Warrant so lost, stolen, mutilated or destroyed.

Section 7. ***Notices, etc.*** All notices and other communications required or permitted hereunder shall be in writing and shall be (i) personally delivered, (ii) sent by facsimile (with a copy sent the same day by certified mail, postage prepaid), or (iii) sent Federal Express or other express service addressed: (a) if to the Center, to the Center's address appearing in the records of the Company or such other address as the Center shall have furnished to the Company in writing, (b) if to any other holder of the Warrant, to such address as such holder shall have furnished the company in writing, or, until any such holder so furnishes an address to the Company, then to and at the address of the last holder of the Warrant who has so furnished an address to the Company, or (c) if to the Company, to the company's address appearing in the records of the Center, or at such other address as the Company shall have furnished to the Center and each such other holder in writing. Notice shall be deemed effective on the date dispatched if by personal delivery, on the date transmitted by facsimile (if confirmed by mail pursuant to this Section 7) or two (2) days after mailing if by Federal Express or express service.

Section 8. ***General Provisions***. The headings in this Warrant are for purposes of reference only and shall not limit or otherwise affect the meaning hereof. The provisions of this Warrant are deemed by the parties to be severable, and the unenforceability of any one or more provisions shall not invalidate or make unenforceable the other provisions. The rights, duties, and obligations of the parties shall inure to the benefit of and be binding on their respective successors and assigns. Neither this Warrant nor any term hereof may be changed, waived, discharged, or terminated orally, but only by an instrument in writing signed by the party against which enforcement of the change, waiver, discharge or termination is sought.

Section 9. **Choice of Law.** This Warrant shall be construed and governed by the laws of the State of North Carolina, excepting only its conflict of law principles.

Section 10. ***Acceptance***. Receipt of this Warrant by the Center shall constitute acceptance of and agreement to the foregoing terms and conditions by the parties hereto.

Section 11. ***Entire Agreement.*** This Warrant reflects the complete understanding of the parties and constitutes their entire agreement regarding the subject matter hereof, all prior negotiations, representations, agreements and understanding having been merged herein.

Form 052010

IN WITNESS WHEREOF, the Company has caused this Warrant to be executed by its duly authorized officers.

HEAT BIOLOGICS, INC.

By: /s/ Jeff Wolf

Printed Name: Jeff Wolf

Title: CEO

Form 052010

Exhibit A

NOTICE OF EXERCISE OF WARRANT

[To be signed only upon exercise of Warrant]

The undersigned, the holder of the within Warrant, hereby (i) irrevocably elects to exercise the right of purchase represented by such Warrant for, and to purchase thereunder, _____ Shares (as that term is defined in the within Warrant) pursuant to the terms of the Warrant, and (ii) hereby elects to make payment in full for the number of Shares so purchased by (a) payment of $_____ cash or cashier's check or, hereby serves notice that $_____ has been credited as payment in principal of the Company's loan from the Center in full payment of the aggregate purchase price for such Shares, or (b) in lieu of the payment of cash, the exchange of the Warrant for a lesser number of Shares as provided in the within Warrant.

The undersigned requests that the certificates for such Shares be issued in the name of, and be delivered to, _____, whose address is _____.

Dated:_____

[HOLDER]

By: _____

Printed Name: _____

Title: _____

Form0908

EXHIBIT 4.10

Form of Representative's Warrant Agreement

THE REGISTERED HOLDER OF THIS PURCHASE WARRANT BY ITS ACCEPTANCE HEREOF, AGREES THAT IT WILL NOT SELL, TRANSFER OR ASSIGN THIS PURCHASE WARRANT EXCEPT AS HEREIN PROVIDED AND THE REGISTERED HOLDER OF THIS PURCHASE WARRANT AGREES THAT IT WILL NOT SELL, TRANSFER, ASSIGN, PLEDGE OR HYPOTHECATE THIS PURCHASE WARRANT FOR A PERIOD OF ONE HUNDRED EIGHTY DAYS FOLLOWING THE EFFECTIVE DATE (DEFINED BELOW) TO ANYONE OTHER THAN (I) AEGIS CAPITAL CORP. OR AN UNDERWRITER OR A SELECTED DEALER IN CONNECTION WITH THE OFFERING, OR (II) A BONA FIDE OFFICER OR PARTNER OF AEGIS CAPITAL CORP. OR OF ANY SUCH UNDERWRITER OR SELECTED DEALER.

THIS PURCHASE WARRANT IS NOT EXERCISABLE PRIOR TO [_____] [**DATE THAT IS ONE YEAR FROM THE EFFECTIVE DATE OF THE OFFERING**]. VOID AFTER 5:00 P.M., EASTERN TIME, [_____] [**DATE THAT IS FIVE YEARS FROM THE EFFECTIVE DATE OF THE OFFERING**].

COMMON STOCK PURCHASE WARRANT

For the Purchase of [_____] Shares of Common Stock
of
HEAT BIOLOGICS, INC.

1. Purchase Warrant. THIS CERTIFIES THAT, in consideration of the payment of $100.00 and for other good and value consideration, Aegis Capital Corp. or its assigns ("**Holder**"), as registered owner of this Purchase Warrant, to Heat Biologics, Inc., a Delaware corporation (the " **Company**"), Holder is entitled, at any time or from time to time from [_____] [**DATE THAT IS ONE YEAR FROM THE EFFECTIVE DATE OF THE OFFERING**] (the "**Commencement Date**"), and at or before 5:00 p.m., Eastern time, [_____] [**DATE THAT IS FIVE YEARS FROM THE EFFECTIVE DATE OF THE OFFERING**] (the "**Expiration Date**"), but not thereafter, to subscribe for, purchase and receive, in whole or in part, up to [____] shares of common stock of the Company, par value $0.0002 per share (the "**Shares**"), subject to adjustment as provided in Section 6 hereof. If the Expiration Date is a day on which banking institutions are authorized by law to close, then this Purchase Warrant may be exercised on the next succeeding day which is not such a day in accordance with the terms herein. During the period ending on the Expiration Date, the Company agrees not to take any action that would terminate this Purchase Warrant. This Purchase Warrant is initially exercisable at $[___] per Share [**125% of the price of the Shares sold in the Offering**]; provided, however, that upon the occurrence of any of the events specified in Section 6 hereof, the rights granted by this Purchase Warrant, including the exercise price per Share and the number of Shares to be received upon such exercise, shall be adjusted as therein specified. The term "**Exercise Price**" shall mean the initial exercise price or the adjusted exercise price, depending on the context.

2. Exercise.

2.1 Exercise Form. In order to exercise this Purchase Warrant, the exercise form attached hereto must be duly executed and completed and delivered to the Company, together with this Purchase Warrant and payment of the Exercise Price for the Shares being purchased payable in cash by wire transfer of immediately available funds to an account designated by the Company or by certified check or official bank check. If the subscription rights represented hereby shall not be exercised at or before 5:00 p.m., Eastern time, on the Expiration Date, this Purchase Warrant shall become and be void without further force or effect, and all rights represented hereby shall cease and expire.

2.2 Cashless Exercise. If at any time after the Commencement Date there is no effective registration statement registering, or no current prospectus available for, the resale of the Shares by the Holder, then in lieu of exercising this Purchase Warrant by payment of cash or check payable to the order of the Company pursuant to Section 2.1 above, Holder may elect to receive the number of Shares equal to the value of this Purchase Warrant (or the portion thereof being exercised), by surrender of this Purchase Warrant to the Company, together with the exercise form attached hereto, in which event the issue to Holder, Shares in accordance with the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where,

X = The number of Shares to be issued to Holder;
Y = The number of Shares for which the Purchase Warrant is being exercised;
A = The fair market value of one Share; and
B = The Exercise Price.

For purposes of this Section 2.2, the fair market value of a Share is defined as follows:

(i) if the Company's common stock is traded on a securities exchange, the value shall be deemed to be the closing price on such exchange prior to the exercise form being submitted in connection with the exercise of the Purchase Warrant; or

(ii) if the Company's common stock is actively traded over-the-counter, the value shall be deemed to be the closing bid prior to the exercise form being submitted in connection with the exercise of the Purchase Warrant; if there is no active public market, the value shall be the fair market value thereof, as determined in good faith by the Company's Board of Directors.

2.3 Legend. Each certificate for the securities purchased under this Purchase Warrant shall bear a legend as follows unless such securities have been registered under the Securities Act of 1933, as amended (the "**Act**"):

"The securities represented by this certificate have not been registered under the Securities Act of 1933, as amended (the " **Act**"), or applicable state law. Neither the securities nor any interest therein may be offered for sale, sold or otherwise transferred except pursuant to an effective registration statement under the Securities Act, or pursuant to an exemption from registration under the Securities Act and applicable state law which, in the opinion of counsel to the Company, is available."

3. Transfer.

3.1 General Restrictions. The registered Holder of this Purchase Warrant agrees by his, her or its acceptance hereof, that such Holder will not: (a) sell, transfer, assign, pledge or hypothecate this Purchase Warrant for a period of one hundred eighty (180) days following the Effective Date to anyone other than: (i) Aegis Capital Corp. ("**Aegis**") or an underwriter or a selected dealer participating in the Offering, or (ii) a bona fide officer or partner of AEGIS or of any such underwriter or selected dealer, in each case in accordance with FINRA Conduct Rule 5110(g)(1), or (b) cause this Purchase Warrant or the securities issuable hereunder to be the subject of any hedging, short sale, derivative, put or call transaction that would result in the effective economic disposition of this Purchase Warrant or the securities hereunder, except as provided for in FINRA Rule 5110(g)(2). On and after 180 days after the Effective Date, transfers to others may be made subject to compliance with or exemptions from applicable securities laws. In order to make any permitted assignment, the Holder must deliver to the Company the assignment form attached hereto duly executed and completed, together with the Purchase Warrant and payment of all transfer taxes, if any, payable in connection therewith. The Company shall within five (5) Business Days transfer this Purchase Warrant on the books of the Company and shall execute and deliver a new Purchase Warrant or Purchase Warrants of like tenor to the appropriate assignee(s) expressly evidencing the right to purchase the aggregate number of Shares purchasable hereunder or such portion of such number as shall be contemplated by any such assignment.

3.2 Restrictions Imposed by the Securities Act . The securities evidenced by this Purchase Warrant shall not be transferred unless and until: (i) the Company has received the opinion of counsel for the Holder that the securities may be transferred pursuant to an exemption from registration under the Securities Act and applicable state securities laws, the availability of which is established to the reasonable satisfaction of the Company (the Company hereby agreeing that the opinion of Reed Smith LLP shall be deemed satisfactory evidence of the availability of an exemption), or (ii) a registration statement or a post-effective amendment to the Registration Statement relating to the offer and sale of such securities has been filed by the Company and declared effective by the U.S. Securities and Exchange Commission (the "**Commission**") and compliance with applicable state securities law has been established.

4. Registration Rights.

4.1 Demand Registration.

4.1.1 Grant of Right. The Company, upon written demand (a "**Demand Notice**") of the Holder(s) of at least 51% of the Purchase Warrants and/or the underlying Shares ("Majority Holders"), agrees to register, on one occasion, all or any portion of the Shares underlying the Purchase Warrants (collectively, the "**Registrable Securities**"). On such occasion, the Company will file a registration statement with the Commission covering the Registrable Securities within sixty (60) days after receipt of a Demand Notice and use its reasonable best efforts to have the registration statement declared effective promptly thereafter, subject to compliance with review by the Commission; provided, however, that the Company shall not be required to comply with a Demand Notice if the Company has filed a registration statement with respect to which the Holder is entitled to piggyback registration rights pursuant to Section 4.2 hereof and either: (i) the Holder has elected to participate in the offering covered by such registration statement or (ii) if such registration statement relates to an underwritten primary offering of securities of the Company, until the offering covered by such registration statement has been withdrawn or until thirty (30) days after such offering is consummated. The demand for registration may be made at any time during a period of four (4) years beginning on the Commencement Date. The Company covenants and agrees to give written notice of its receipt of any Demand Notice by any Holder(s) to all other registered

Holders of the Purchase Warrants and/or the Registrable Securities within ten (10) days after the date of the receipt of any such Demand Notice.

4.1.2 Terms. The Company shall bear all fees and expenses attendant to the registration of the Registrable Securities pursuant to Section 4.1.1, but the Holders shall pay any and all underwriting commissions and the expenses of any legal counsel selected by the Holders to represent them in connection with the sale of the Registrable Securities. The Company agrees to use its reasonable best efforts to cause the filing required herein to become effective promptly and to qualify or register the Registrable Securities in such States as are reasonably requested by the Holder(s); provided, however, that in no event shall the Company be required to register the Registrable Securities in a State in which such registration would cause: (i) the Company to be obligated to register or license to do business in such State or submit to general service of process in such State, or (ii) the principal shareholders of the Company to be obligated to escrow their shares of capital stock of the Company. The Company shall cause any registration statement filed pursuant to the demand right granted under Section 4.1.1 to remain effective for a period of at least twelve (12) consecutive months after the date that the Holders of the Registrable Securities covered by such registration statement are first given the opportunity to sell all of such securities. The Holders shall only use the prospectuses provided by the Company to sell the shares covered by such registration statement, and will immediately cease to use any prospectus furnished by the Company if the Company advises the Holder that such prospectus may no longer be used due to a material misstatement or omission. Notwithstanding the provisions of this Section 4.1.2, the Holder shall be entitled to a demand registration under this Section 4.1.2 on only one (1) occasion and such demand registration right shall terminate on the fifth anniversary of the effectiveness of the registration statement in accordance with FINRA Rule 5110(f)(2)(H)(iv).

4.2 "Piggy-Back" Registration.

4.2.1 Grant of Right. In addition to the demand right of registration described in Section 4.1 hereof, the Holder shall have the right, for a period of no more than seven (7) years from the date of effectiveness of the registration statement in accordance with FINRA Rule 5110(f)(2)(H)(v), to include the Registrable Securities as part of any other registration of securities filed by the Company (other than in connection with a transaction contemplated by Rule 145(a) promulgated under the Securities Act or pursuant to Form S-8 or any equivalent form); provided, however, that if, solely in connection with any primary underwritten public offering for the account of the Company, the managing underwriter(s) thereof shall, in its reasonable discretion, impose a limitation on the number of shares of Common Stock which may be included in the Registration Statement because, in such underwriter(s)' judgment, marketing or other factors dictate such limitation is necessary to facilitate public distribution, then the Company shall be obligated to include in such Registration Statement only such limited portion of the Registrable Securities with respect to which the Holder requested inclusion hereunder as the underwriter shall reasonably permit. Any exclusion of Registrable Securities shall be made pro rata among the Holders seeking to include Registrable Securities in proportion to the number of Registrable Securities sought to be included by such Holders; provided, however, that the Company shall not exclude any Registrable Securities unless the Company has first excluded all outstanding securities, the holders of which are not entitled to inclusion of such securities in such Registration Statement or are not entitled to pro rata inclusion with the Registrable Securities; provided, further, that all of the rights set forth above shall be subject to and subordinate to the preferred rights of the Preferred Stockholders, as set forth and defined in that certain Investor Rights Agreement, dated March 25, 2013, by and among the Company and the Preferred Stockholders (as defined therein).

4.2.2 Terms. The Company shall bear all fees and expenses attendant to registering the Registrable Securities pursuant to Section 4.2.1 hereof, but the Holders shall pay any and all underwriting commissions and the expenses of any legal counsel selected by the Holders to represent them in connection with the sale of the Registrable Securities. In the event of such a proposed registration, the Company shall furnish the then Holders of outstanding Registrable Securities with not less than thirty (30) days written notice prior to the proposed date of filing of such registration statement. Such notice to the Holders shall continue to be given for each registration statement filed by the Company until such time as all of the Registrable Securities have been sold by the Holder. The holders of the Registrable Securities shall exercise the "piggy-back" rights provided for herein by giving written notice within ten (10) days of the receipt of the Company's notice of its intention to file a registration statement. Except as otherwise provided in this Purchase Warrant, there shall be no limit on the number of times the Holder may request registration under this Section 4.2.2; provided, however, that such registration rights shall terminate on the sixth anniversary of the Commencement Date.

4.3 General Terms.

4.3.1 Indemnification. The Company shall indemnify the Holder(s) of the Registrable Securities to be sold pursuant to any registration statement hereunder and each person, if any, who controls such Holders within the meaning of Section 15 of the Securities Act or Section 20 (a) of the Securities Exchange Act of 1934, as amended ("**Exchange Act**"), against all loss, claim, damage, expense or liability (including all reasonable attorneys' fees and other expenses reasonably incurred in investigating, preparing or defending against any claim whatsoever) to which any of them may become subject under the Securities Act, the Exchange Act or otherwise, arising from such registration statement but only to the same extent and with the same effect as the provisions pursuant to which the Company has agreed to indemnify the Underwriters contained in Section 5.1 of the Underwriting Agreement between the Underwriters and the Company, dated as of [_____], 2013. The Holder(s) of the Registrable Securities to be sold pursuant to such registration statement, and their successors and assigns, shall severally, and not jointly, indemnify the Company, against all loss, claim, damage, expense or liability (including all reasonable attorneys' fees and other expenses reasonably incurred in investigating, preparing or defending against any claim whatsoever) to which they may become subject under the Securities Act, the Exchange Act or otherwise, arising from information furnished by or on behalf of such Holders, or their successors or assigns, in writing, for specific inclusion in such registration statement to the same extent and with the same effect as the provisions contained in Section 5.2 of the Underwriting Agreement pursuant to which the Underwriters have agreed to indemnify the Company.

4.3.2 Exercise of Purchase Warrants. Nothing contained in this Purchase Warrant shall be construed as requiring the Holder(s) to exercise their Purchase Warrants prior to or after the initial filing of any registration statement or the effectiveness thereof.

4.3.3 Documents Delivered to Holders. The Company shall furnish to each Holder participating in any of the foregoing offerings and to each underwriter of any such offering, if any, a signed counterpart, addressed to such Holder or underwriter, of: (i) an opinion of counsel to the Company, dated the effective date of such registration statement (and, if such registration includes an underwritten public offering, an opinion dated the date of the closing under any underwriting agreement related thereto), and (ii) a "cold comfort" letter dated the effective date of such registration statement (and, if such registration includes an underwritten public offering, a letter dated the date of the closing under the underwriting agreement) signed by the independent registered public accounting firm which has issued a report on the Company's financial statements included in such registration statement, in each case covering substantially the same matters with respect to such registration statement (and the prospectus included therein) and, in the case of such accountants' letter, with respect to events subsequent

to the date of such financial statements, as are customarily covered in opinions of issuer's counsel and in accountants' letters delivered to underwriters in underwritten public offerings of securities. The Company shall also deliver promptly to each Holder participating in the offering requesting the correspondence and memoranda described below and to the managing underwriter, if any, copies of all correspondence between the Commission and the Company, its counsel or auditors and all memoranda relating to discussions with the Commission or its staff with respect to the registration statement and permit each Holder and underwriter to do such investigation, upon reasonable advance notice, with respect to information contained in or omitted from the registration statement as it deems reasonably necessary to comply with applicable securities laws or rules of FINRA. Such investigation shall include access to books, records and properties and opportunities to discuss the business of the Company with its officers and independent auditors, all to such reasonable extent and at such reasonable times as any such Holder shall reasonably request.

4.3.4 Underwriting Agreement. The Company shall enter into an underwriting agreement with the managing underwriter(s), if any, selected by any Holders whose Registrable Securities are being registered pursuant to this Section 4, which managing underwriter shall be reasonably satisfactory to the Company. Such agreement shall be reasonably satisfactory in form and substance to the Company, each Holder and such managing underwriters, and shall contain such representations, warranties and covenants by the Company and such other terms as are customarily contained in agreements of that type used by the managing underwriter. The Holders shall be parties to any underwriting agreement relating to an underwritten sale of their Registrable Securities and may, at their option, require that any or all the representations, warranties and covenants of the Company to or for the benefit of such underwriters shall also be made to and for the benefit of such Holders. Such Holders shall not be required to make any representations or warranties to or agreements with the Company or the underwriters except as they may relate to such Holders, their Shares and their intended methods of distribution.

4.3.5 Documents to be Delivered by Holder(s). Each of the Holder(s) participating in any of the foregoing offerings shall furnish to the Company a completed and executed questionnaire provided by the Company requesting information customarily sought of selling security holders.

4.3.6 Damages. Should the registration or the effectiveness thereof required by Sections 4.1 and 4.2 hereof be delayed by the Company or the Company otherwise fails to comply with such provisions, the Holder(s) shall, in addition to any other legal or other relief available to the Holder(s), be entitled to obtain specific performance or other equitable (including injunctive) relief against the threatened breach of such provisions or the continuation of any such breach, without the necessity of proving actual damages and without the necessity of posting bond or other security.

5. New Purchase Warrants to be Issued.

5.1 Partial Exercise or Transfer. Subject to the restrictions in Section 3 hereof, this Purchase Warrant may be exercised or assigned in whole or in part. In the event of the exercise or assignment hereof in part only, upon surrender of this Purchase Warrant for cancellation, together with the duly executed exercise or assignment form and funds sufficient to pay any Exercise Price and/or transfer tax if exercised pursuant to Section 2.1 hereto, the Company shall cause to be delivered to the Holder without charge a new Purchase Warrant of like tenor to this Purchase Warrant in the name of the Holder evidencing the right of the Holder to purchase the number of Shares purchasable hereunder as to which this Purchase Warrant has not been exercised or assigned.

5.2 Lost Certificate. Upon receipt by the Company of evidence satisfactory to it of the loss, theft, destruction or mutilation of this Purchase Warrant and of reasonably satisfactory indemnification or the posting of a bond, the Company shall execute and deliver a new Purchase Warrant of like tenor and date. Any such new Purchase Warrant executed and delivered as a result of such loss, theft, mutilation or destruction shall constitute a substitute contractual obligation on the part of the Company.

6. Adjustments.

6.1 Adjustments to Exercise Price and Number of Securities. The Exercise Price and the number of Shares underlying the Purchase Warrant shall be subject to adjustment from time to time as hereinafter set forth:

6.1.1 Share Dividends; Split Ups. If, after the date hereof, and subject to the provisions of Section 6.3 below, the number of outstanding Shares is increased by a stock dividend payable in Shares or by a split up of Shares or other similar event, then, on the effective day thereof, the number of Shares purchasable hereunder shall be increased in proportion to such increase in outstanding Shares, and the Exercise Price shall be proportionately decreased.

6.1.2 Aggregation of Shares. If, after the date hereof, and subject to the provisions of Section 6.3 below, the number of outstanding Shares is decreased by a consolidation, combination or reclassification of Shares or other similar event, then, on the effective date thereof, the number of Shares purchasable hereunder shall be decreased in proportion to such decrease in outstanding Shares, and the Exercise Price shall be proportionately increased.

6.1.3 Replacement of Securities upon Reorganization, etc. In case of any reclassification or reorganization of the outstanding Shares other than a change covered by Section 6.1.1 or 6.1.2 hereof or that solely affects the par value of such Shares, or in the case of any share reconstruction or amalgamation or consolidation of the Company with or into another corporation (other than a consolidation or share reconstruction or amalgamation in which the Company is the continuing corporation and that does not result in any reclassification or reorganization of the outstanding Shares), or in the case of any sale or conveyance to another corporation or entity of the property of the Company as an entirety or substantially as an entirety in connection with which the Company is dissolved, the Holder of this Purchase Warrant shall have the right thereafter (until the expiration of the right of exercise of this Purchase Warrant) to receive upon the exercise hereof, for the same aggregate Exercise Price payable hereunder immediately prior to such event, the kind and amount of shares of stock or other securities or property (including cash) receivable upon such reclassification, reorganization, share reconstruction or amalgamation, or consolidation, or upon a dissolution following any such sale or transfer, by a Holder of the number of Shares of the Company obtainable upon exercise of this Purchase Warrant immediately prior to such event; and if any reclassification also results in a change in Shares covered by Section 6.1.1 or 6.1.2, then such adjustment shall be made pursuant to Sections 6.1.1, 6.1.2 and this Section 6.1.3. The provisions of this Section 6.1.3 shall similarly apply to successive reclassifications, reorganizations, share reconstructions or amalgamations, or consolidations, sales or other transfers.

6.1.4 Changes in Form of Purchase Warrant. This form of Purchase Warrant need not be changed because of any change pursuant to this Section 6.1, and Purchase Warrants issued after such change may state the same Exercise Price and the same number of Shares as are stated in the Purchase Warrants initially issued pursuant to this Agreement. The acceptance by any Holder of the issuance of new Purchase Warrants reflecting a required or permissive change shall not be deemed to waive any rights to an adjustment occurring after the Commencement Date or the computation thereof.

6.2 Substitute Purchase Warrant. In case of any consolidation of the Company with, or share reconstruction or amalgamation of the Company with or into, another corporation (other than a consolidation or share reconstruction or amalgamation which does not result in any reclassification or change of the outstanding Shares), the corporation formed by such consolidation or share reconstruction or amalgamation shall execute and deliver to the Holder a supplemental Purchase Warrant providing that the holder of each Purchase Warrant then outstanding or to be outstanding shall have the right thereafter (until the stated expiration of such Purchase Warrant) to receive, upon exercise of such Purchase Warrant, the kind and amount of shares of stock and other securities and property receivable upon such consolidation or share reconstruction or amalgamation, by a holder of the number of Shares of the Company for which such Purchase Warrant might have been exercised immediately prior to such consolidation, share reconstruction or amalgamation, sale or transfer. Such supplemental Purchase Warrant shall provide for adjustments which shall be identical to the adjustments provided for in this Section 6. The above provision of this Section shall similarly apply to successive consolidations or share reconstructions or amalgamations.

6.3 Elimination of Fractional Interests. The Company shall not be required to issue certificates representing fractions of Shares upon the exercise of the Purchase Warrant, nor shall it be required to issue scrip or pay cash in lieu of any fractional interests, it being the intent of the parties that all fractional interests shall be eliminated by rounding any fraction up or down, as the case may be, to the nearest whole number of Shares or other securities, properties or rights.

7. Reservation and Listing. The Company shall at all times reserve and keep available out of its authorized Shares, solely for the purpose of issuance upon exercise of the Purchase Warrants, such number of Shares or other securities, properties or rights as shall be issuable upon the exercise thereof. The Company covenants and agrees that, upon exercise of the Purchase Warrants and payment of the Exercise Price therefor, in accordance with the terms hereby, all Shares and other securities issuable upon such exercise shall be duly and validly issued, fully paid and non-assessable and not subject to preemptive rights of any shareholder. The Company further covenants and agrees that upon exercise of the Purchase Warrants and payment of the exercise price therefor, all Shares and other securities issuable upon such exercise shall be duly and validly issued, fully paid and non-assessable and not subject to preemptive rights of any shareholder. As long as the Purchase Warrants shall be outstanding, the Company shall use its commercially reasonable efforts to cause all Shares issuable upon exercise of the Purchase Warrants to be listed (subject to official notice of issuance) on all national securities exchanges (or, if applicable, on the OTC Bulletin Board or any successor trading market) on which the Shares issued to the public in the Offering may then be listed and/or quoted.

8. Certain Notice Requirements.

8.1 Holder's Right to Receive Notice. Nothing herein shall be construed as conferring upon the Holders the right to vote or consent or to receive notice as a shareholder for the election of directors or any other matter, or as having any rights whatsoever as a shareholder of the Company. If, however, at any time prior to the expiration of the Purchase Warrants and their exercise, any of the events described in Section 8.2 shall occur, then, in one or more of said events, the Company shall give written notice of such event at least fifteen days prior to the date fixed as a record date or the date of closing the transfer books for the determination of the shareholders entitled to such dividend, distribution, conversion or exchange of securities or subscription rights, or entitled to vote on such proposed dissolution, liquidation, winding up or sale. Such notice shall specify such record date or the date of the closing of the transfer books, as the case may be. Notwithstanding the foregoing, the Company shall deliver to each Holder a copy of each notice given to the other shareholders of the Company at the same time and in the same manner that such notice is given to the shareholders.

8.2 Events Requiring Notice. The Company shall be required to give the notice described in this Section 8 upon one or more of the following events: (i) if the Company shall take a record of the holders of its Shares for the purpose of entitling them to receive a dividend or distribution payable otherwise than in cash, or a cash dividend or distribution payable otherwise than out of retained earnings, as indicated by the accounting treatment of such dividend or distribution on the books of the Company, (ii) the Company shall offer to all the holders of its Shares any additional shares of capital stock of the Company or securities convertible into or exchangeable for shares of capital stock of the Company, or any option, right or warrant to subscribe therefor, or (iii) a dissolution, liquidation or winding up of the Company (other than in connection with a consolidation or share reconstruction or amalgamation) or a sale of all or substantially all of its property, assets and business shall be proposed.

8.3 Notice of Change in Exercise Price. The Company shall, promptly after an event requiring a change in the Exercise Price pursuant to Section 6 hereof, send notice to the Holders of such event and change ("**Price Notice**"). The Price Notice shall describe the event causing the change and the method of calculating same and shall be certified as being true and accurate by the Company's Chief Financial Officer.

8.4 Transmittal of Notices. All notices, requests, consents and other communications under this Purchase Warrant shall be in writing and shall be deemed to have been duly made when hand delivered, or mailed by express mail or private courier service: (i) if to the registered Holder of the Purchase Warrant, to the address of such Holder as shown on the books of the Company, or (ii) if to the Company, to following address or to such other address as the Company may designate by notice to the Holders:

If to the Holder:

Aegis Capital Corp.
810 Seventh Avenue, 11th Floor
New York, New York 10019
Attn: Mr. David Bocchi, Managing Director of Investment Banking
Fax No.: (212) 813-1047

with a copy (which shall not constitute notice) to:

Reed Smith LLP
599 Lexington Avenue
New York, NY 10022
Attn: Yvan-Claude Pierre, Esq.
Fax No.: 212-521-5450

If to the Company:

Heat Biologics, Inc.
100 Europa Drive
Chapel Hill, North Carolina 27517
Attention: Jeffrey Wolf, Chief Executive Officer
Fax No: [•]

with a copy (which shall not constitute notice) to:

Gracin & Marlow, LLP
Chrysler Building
405 Lexington Avenue, 26th Floor
New York, New York 10174
Attention: Leslie Marlow, Esq.
Fax No: (212) 208-4657

9. Miscellaneous.

9.1 Amendments. The Company and Aegis may from time to time supplement or amend this Purchase Warrant without the approval of any of the Holders in order to cure any ambiguity, to correct or supplement any provision contained herein that may be defective or inconsistent with any other provisions herein, or to make any other provisions in regard to matters or questions arising hereunder that the Company and Aegis may deem necessary or desirable and that the Company and Aegis deem shall not adversely affect the interest of the Holders. All other modifications or amendments shall require the written consent of and be signed by the party against whom enforcement of the modification or amendment is sought.

9.2 Headings. The headings contained herein are for the sole purpose of convenience of reference, and shall not in any way limit or affect the meaning or interpretation of any of the terms or provisions of this Purchase Warrant.

9.3. Entire Agreement. This Purchase Warrant (together with the other agreements and documents being delivered pursuant to or in connection with this Purchase Warrant) constitutes the entire agreement of the parties hereto with respect to the subject matter hereof, and supersedes all prior agreements and understandings of the parties, oral and written, with respect to the subject matter hereof.

9.4 Binding Effect. This Purchase Warrant shall inure solely to the benefit of and shall be binding upon, the Holder and the Company and their permitted assignees, respective successors, legal representative and assigns, and no other person shall have or be construed to have any legal or equitable right, remedy or claim under or in respect of or by virtue of this Purchase Warrant or any provisions herein contained.

9.5 Governing Law; Submission to Jurisdiction; Trial by Jury. This Purchase Warrant shall be governed by and construed and enforced in accordance with the laws of the State of New York, without giving effect to conflict of laws principles thereof. The Company hereby agrees that any action, proceeding or claim against it arising out of, or relating in any way to this Purchase Warrant shall be brought and enforced in the New York Supreme Court, County of New York, or in the United States District Court for the Southern District of New York, and irrevocably submits to such jurisdiction, which jurisdiction shall be exclusive. The Company hereby waives any objection to such exclusive jurisdiction and that such courts represent an inconvenient forum. Any process or summons to be served upon the Company may be served by transmitting a copy thereof by registered or certified mail, return receipt requested, postage prepaid, addressed to it at the address set forth in Section 8 hereof. Such mailing shall be deemed personal service and shall be legal and binding upon the Company in any action, proceeding or claim. The Company and the Holder agree that the prevailing party(ies) in any such action shall be entitled to recover from the other party(ies) all of its reasonable attorneys' fees and expenses relating to such action or proceeding and/or incurred in connection with the preparation therefor. The Company (on its behalf and, to the extent permitted by applicable law, on behalf of its stockholders and affiliates) and

the Holder hereby irrevocably waive, to the fullest extent permitted by applicable law, any and all right to trial by jury in any legal proceeding arising out of or relating to this Agreement or the transactions contemplated hereby.

9.6 Waiver, etc. The failure of the Company or the Holder to at any time enforce any of the provisions of this Purchase Warrant shall not be deemed or construed to be a waiver of any such provision, nor to in any way affect the validity of this Purchase Warrant or any provision hereof or the right of the Company or any Holder to thereafter enforce each and every provision of this Purchase Warrant. No waiver of any breach, non-compliance or non-fulfillment of any of the provisions of this Purchase Warrant shall be effective unless set forth in a written instrument executed by the party or parties against whom or which enforcement of such waiver is sought; and no waiver of any such breach, non-compliance or non-fulfillment shall be construed or deemed to be a waiver of any other or subsequent breach, non-compliance or non-fulfillment.

9.7 Execution in Counterparts. This Purchase Warrant may be executed in one or more counterparts, and by the different parties hereto in separate counterparts, each of which shall be deemed to be an original, but all of which taken together shall constitute one and the same agreement, and shall become effective when one or more counterparts has been signed by each of the parties hereto and delivered to each of the other parties hereto. Such counterparts may be delivered by facsimile transmission or other electronic transmission.

9.8 Exchange Agreement. As a condition of the Holder's receipt and acceptance of this Purchase Warrant, Holder agrees that, at any time prior to the complete exercise of this Purchase Warrant by Holder, if the Company and Aegis enter into an agreement ("**Exchange Agreement**") pursuant to which they agree that all outstanding Purchase Warrants will be exchanged for securities or cash or a combination of both, then Holder shall agree to such exchange and become a party to the Exchange Agreement.

[*Signature Page Follows*]

IN WITNESS WHEREOF, the Company has caused this Purchase Warrant to be signed by its duly authorized officer as of the ____ day of _____, 2013.

HEAT BIOLOGICS, INC.

By:_____
Name:
Title:

[*Form to be used to exercise Purchase Warrant*]

Date: _____, 20___

The undersigned hereby elects irrevocably to exercise the Purchase Warrant for _____ shares of common stock, par value $0.0002 per share (the "**Shares**"), of Heat Biologics, Inc., a Delaware corporation (the "**Company**"), and hereby makes payment of $____ (at the rate of $____ per Share) in payment of the Exercise Price pursuant thereto. Please issue the Shares as to which this Purchase Warrant is exercised in accordance with the instructions given below and, if applicable, a new Purchase Warrant representing the number of Shares for which this Purchase Warrant has not been exercised.

or

The undersigned hereby elects irrevocably to convert its right to purchase ___ Shares of the Company under the Purchase Warrant for _____ Shares, as determined in accordance with the following formula:

$$X = \frac{Y(A-B)}{A}$$

Where,

X = The number of Shares to be issued to Holder;
Y = The number of Shares for which the Purchase Warrant is being exercised;
A = The fair market value of one Share which is equal to $_____; and
B = The Exercise Price which is equal to $_____ per share

The undersigned agrees and acknowledges that the calculation set forth above is subject to confirmation by the Company and any disagreement with respect to the calculation shall be resolved by the Company in its sole discretion.

Please issue the Shares as to which this Purchase Warrant is exercised in accordance with the instructions given below and, if applicable, a new Purchase Warrant representing the number of Shares for which this Purchase Warrant has not been converted.

Signature _____

Signature Guaranteed _____

INSTRUCTIONS FOR REGISTRATION OF SECURITIES

Name: _____
(Print in Block Letters)

Address: _____

_____

_____

NOTICE: The signature to this form must correspond with the name as written upon the face of the Purchase Warrant without alteration or enlargement or any change whatsoever, and must be guaranteed by a bank, other than a savings bank, or by a trust company or by a firm having membership on a registered national securities exchange.

[*Form to be used to assign Purchase Warrant*]

ASSIGNMENT

(To be executed by the registered Holder to effect a transfer of the within Purchase Warrant):

FOR VALUE RECEIVED, _____ does hereby sell, assign and transfer unto the right to purchase shares of common stock, par value $0.0002 per share, of Heat Biologics, Inc., a Delaware corporation (the "**Company**"), evidenced by the Purchase Warrant and does hereby authorize the Company to transfer such right on the books of the Company.

Dated: _____, 20__

Signature _____

Signature Guaranteed _____

NOTICE: The signature to this form must correspond with the name as written upon the face of the within Purchase Warrant without alteration or enlargement or any change whatsoever, and must be guaranteed by a bank, other than a savings bank, or by a trust company or by a firm having membership on a registered national securities exchange.

Exhibit 4.11

AMENDMENT TO STOCK WARRANT

This Amendment (the "Amendment") dated May 24, 2013 amends that certain Stock Warrant, dated December 14, 2011, (the "Warrant") by and between the North Carolina Biotechnology Center ("NCBIO") and HEAT BIOLOGICS, INC. a Delaware corporation ("HEAT").

WHEREAS, NCBIO and HEAT are parties to the Warrant and in order to facilitate the contemplated initial public offering of the HEAT, they desire to amend the conversion terms of the Warrant.

NOW THEREFORE in consideration of the premises and ten dollars ($10.00) paid in hand and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Notwithstanding anything to the contrary contained in the Warrant, the Warrant shall only be exercisable for 29,762 shares of the Company's Common Stock, subject to adjustment as set forth therein. As such, the first paragraph in the RECITALS of the Warrant is hereby deleted in its entirety and replaced with the following:

> "THIS CERTIFIES that, for value received, the North Carolina Biotechnology Center (the "Center") is entitled to subscribe for and purchase from Heat Biologics, Inc. (the "Company"), 29,762 shares of the Company's Common Stock (the "Shares"), subject to adjustment as set forth herein, at a price per Share of $2.10, subject to adjustment as set forth herein (the "Exercise Price")."

2. Representations and Warranties. HEAT represents and warrants that the Warrants, as amended pursuant to Section 1 are being and will be amended on the same basis and exchange ratio as shares of Series A stock are converted into HEAT Common Stock by the other Series A shareholders. The Parties acknowledge that dividends, if any, will accrue only up to the date of conversion of the Series A shares.

3. Successors. This Amendment shall be fully binding upon and enforceable with respect to the parties and their respective representatives, successors, partners, executors, and assigns.

4. Authority. Each of the parties hereto represents to the other that: (a) it has the corporate or other requisite power and authority to execute deliver and perform this Amendment; (b) the execution, delivery and performance of this Amendment by it has been duly authorized by all necessary corporate or other actions; (c) it has duly and validly executed and delivered this Amendment; and (d) this Amendment is a legal, valid and binding obligations, enforceable against it in accordance with its terms subject to applicable bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting creditors' rights generally and general equity principles.

5. Governing Law. This Amendment shall be governed by and construed in accordance with the law of the State of North Carolina, without regard to the conflicts of law rules of such state. In any action or proceeding arising out of or relating to this Amendment (an "Action"), each of the parties hereby irrevocably submits to the exclusive jurisdiction of any federal or state court sitting in Orange County, North Carolina and further agrees that an Action shall be heard and determined in such North Carolina federal court or in such state court. Each party hereby irrevocably waives to the fullest extent it may effectively do so the defense of an inconvenient forum to the maintenance of any Action in Orange County, North Carolina.

6. Miscellaneous. The Warrant, as amended by this Amendment, contains the entire agreement between the parties hereto regarding the Warrant and there are no agreements, warranties or representations which are not set forth therein or herein. This Amendment may not be modified or amended except by an instrument in writing duly signed by or on behalf of the parties hereto. This Amendment may be executed simultaneously in any number of counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have caused this Amendment to be duly executed as of the day and year first above written.

NORTH CAROLINA BIOTECHNOLOGY CENTER, INC.

By: /s/ Patricia J. Gravirese
Name: Patricia J. Gravirese
Title: Controller/Assist. Secretary

HEAT BIOLOGICS, INC.

By: /s/ Jeffrey Wolf
Name: Jeffrey Wolf
Title: President

EXHIBIT 4.12

AMENDMENT TO WARRANT TO PURCHASE STOCK

This Amendment (the "Amendment") dated as of May 28, 2013 amends that certain Warrant to Purchase Stock dated August 7, 2012 (the "Warrant") issued by HEAT BIOLOGICS, INC. a Delaware corporation ("HEAT") to Square 1 Bank ("SQUARE 1").

WHEREAS, in order to facilitate the contemplated initial public offering of HEAT, SQUARE 1 and HEAT desire to amend the conversion terms of the Warrant.

NOW THEREFORE in consideration of the premises and ten dollars ($10.00) paid in hand and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Notwithstanding anything to the contrary contained in the Warrant, the Warrant shall be exercisable for 17,500 shares of the Company's Common Stock, subject to adjustment as set forth therein. As such, the introductory caption of the Warrant is hereby deleted in its entirety and replaced with the following:

"Corporation:	Heat Biologics, Inc.
Number of Shares:	17,500 (subject to adjustment pursuant to Section 1.7 which adjustment shall include an adjustment for the 1-for-2.3 stock split to be effectuated on or about May 29, 2013)
Class of Stock:	Common Stock
Initial Exercise Price:	$2.10 per share
Issue Date:	August 7, 2012
Expiration Date:	August 7, 2022"

Notwithstanding the foregoing, if the Company does not consummate an initial public offering of the Company's Common Stock on or before December 31, 2013, then the amendment to the Warrant accomplished by this Section 1 shall be deemed null and void, and the introductory caption of the Warrant shall revert to the caption in place immediately prior to the date of this Amendment (subject to any adjustments pursuant to the provisions of the Warrant).

2. Section 3.4 of the Warrant is hereby deleted and replaced with the following:

"3.4 "Piggy-Back" Registration.

3.4.1 Grant of Right. The Holder shall have the right to include the Common Stock of the Company for which this warrant is exercisable (the "Registrable Securities") as part of any other registration of securities filed by the Company (other than in connection with a transaction contemplated by Rule 145(a) promulgated under the Securities Act or pursuant to Form S-8 or any equivalent form); provided, however, that if, solely in connection with any primary underwritten public offering for the account of the Company, the managing underwriter(s) thereof shall, in its reasonable discretion, impose a limitation on the number of shares of Common Stock which may be included in the registration statement because, in such underwriter(s)' judgment, marketing or other factors dictate such

limitation is necessary to facilitate public distribution, then the Company shall be obligated to include in such registration statement only such limited portion of the Registrable Securities with respect to which the Holder requested inclusion hereunder as the underwriter shall reasonably permit. Any exclusion of Registrable Securities shall be made ***pro rata*** among all the Holders of Common Stock seeking to include Registrable Securities in proportion to the number of Registrable Securities sought to be included by such Holders; provided, however, that all of the rights set forth above shall be subject to and subordinate to the prior rights of Aegis Capital Corp. or any other underwriter engaged by the Company in connection with its initial public offering of its common stock and of any Series B Stockholders, as set forth and defined in that certain Investor Rights Agreement, dated March 25, 2013, by and among the Company and the Preferred Stockholders (as defined therein).

3.4.2 Terms. The Company shall bear all fees and expenses attendant to registering the Registrable Securities pursuant to Section 3.4.1 hereof, but the Holder shall pay any and all underwriting commissions relating to shares of Registrable Securities sold in such registration and the expenses of any legal counsel selected by the Holder to represent it in connection with the sale of the Registrable Securities. In the event of such a proposed registration, the Company shall furnish the Holder with not less than twenty (20) days written notice prior to the proposed date of filing of such registration statement. Such notice shall continue to be given for each registration statement filed by the Company until such time as all of the Registrable Securities have been sold by the Holder. The Holder of the Registrable Securities shall exercise the "piggy-back" rights provided for herein by giving written notice within seven (7) days of the receipt of the Company's notice of its intention to file a registration statement. There shall be no limit on the number of times the Holder may request registration under this Section 3.4.2; provided, however, that such registration rights shall cease upon (A) the sale of the Registrable Securities pursuant to an effective registration statement, (B) the sale of the Registrable Securities pursuant to Rule 144 (or successor rule) under the Securities Act of 1933, as amended, (C) the Registrable Securities no longer being outstanding; or (D) the Registrable Securities becoming eligible for sale under Rule 144 without any holding period limits or volume limitations.

3.4.3 General Terms.

A. Underwriting Agreement. The Holder shall be a party to any underwriting agreement relating to an underwritten sale of its Registrable Securities and may, at its option, require that any or all the representations, warranties and covenants of the Company to or for the benefit of such underwriters shall also be made to and for its benefit. The Holder shall not be required to make any representations or warranties to or agreements with the Company or the underwriters except as they may relate to the Holder, its Registrable Securities and its intended methods of distribution.

B Documents to be Delivered by Holder(s). If the Holder participates in any of the foregoing offerings, it shall furnish the Company with a completed and executed questionnaire provided by the Company requesting information customarily sought of selling security holders."

3. Successors. This Agreement shall be fully binding upon and enforceable with respect to the parties and their respective representatives, successors, partners, executors, and assigns.

4. Authority. Each of the parties hereto represents to the other that: (a) it has the corporate or other requisite power and authority to execute deliver and perform this Amendment; (b) the execution, delivery and performance of this Amendment by it has been duly authorized by all necessary corporate or other actions; (c) it has duly and validly executed and delivered this Amendment; and (d) this Amendment is a legal, valid and binding obligation, enforceable against it in accordance with its terms subject to applicable bankruptcy, insolvency, reorganization, moratorium or other similar laws affecting creditors' rights generally and general equity principles.

5. Governing Law. This Amendment shall be governed by and construed in accordance with the law of the State of North Carolina, without regard to the conflicts of law rules of such state. In any action or proceeding arising out of or relating to this Amendment (an "Action"), each of the parties hereby irrevocably submits to the exclusive jurisdiction of any federal or state court sitting in Wake County, North Carolina and further agrees that an Action shall be heard and determined in such North Carolina federal or state court. Each party hereby irrevocably waives to the fullest extent it may effectively do so the defense of an inconvenient forum to the maintenance of any Action in Wake County, North Carolina.

6. Miscellaneous. The Warrant, as amended by this Amendment, contains the entire agreement between the parties hereto regarding the Warrant and there are no agreements, warranties or representations which are not set forth therein or herein. This Amendment may not be modified or amended except by an instrument in writing duly signed by or on behalf of the parties hereto. This Amendment may be executed simultaneously in any number of counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties hereto have caused this Amendment to be duly executed as of the day and year first above written.

SQUARE 1 BANK

By: _____
Name:
Title:

HEAT BIOLOGICS, INC.

By: _____
Name: Jeffrey Wolf
Title: President

EXHIBIT 5.1

GRACIN & MARLOW, LLP
The Chrysler Building
405 Lexington Avenue, 26th Floor
New York, New York 10174
Telephone (212) 907-6457
www.gracinmarlow.com

May 30, 2013

The Board of Directors
Heat Biologics, Inc.
100 Europa Drive
Chapel Hill, NC 27517

Gentlemen:

We have acted as counsel to Heat Biologics, Inc., a Delaware corporation (the "Company"), and are rendering this opinion in connection with the filing of a Registration Statement on Form S-1 (File No. 333-188365) (the "Registration Statement") by the Company with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), relating to the registration of the sale by the Company of (i) up to 1,897,500 shares (the "Shares") of common stock par value $0.0002 per share (the "Common Stock"), including up to 247,500 shares of Common Stock for which the underwriters have been granted an over-allotment option; (ii) a warrant (the "Warrant") to purchase up to 94,875 shares of the Company's Common Stock (the "Warrant Shares"); and (iii) the Warrant Shares. The Shares and the Warrant Shares are to be sold by the Company pursuant to an underwriting agreement by and among the Company and Aegis Capital Corp. (the "Underwriting Agreement"), the form of which has been filed as Exhibit 1.1 to the Registration Statement.

We are acting as counsel for the Company in connection with the issue and sale by the Company of the Shares, the Warrant and the Warrant Shares. We have examined signed copies of the Registration Statement as filed with the Commission. We have also examined and relied upon the Underwriting Agreement, the Warrant, stock record books, minutes of meetings and actions of the stockholders and the Board of Directors of the Company as provided to us by the Company, the Certificate of Incorporation and the By-laws of the Company, each as restated and/or amended to date, and such other documents as we have deemed necessary for purposes of rendering the opinions hereinafter set forth.

In our examination of the foregoing documents, we have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as copies, the authenticity of the originals of such latter documents and the legal competence of all signatories to such documents.

We express no opinion herein as to the laws of any state or jurisdiction other than the substantive laws of the State of New York as it relates to the Warrant, the General Corporation Law of the State of Delaware and the federal laws of the United States of America.

Based upon and subject to the foregoing, we are of the opinion that: (i) the Shares have been duly authorized for issuance and, when issued and paid for in accordance with the terms and conditions of the Underwriting Agreement, will be validly issued, fully paid and nonassessable; (ii) the Warrant has been duly authorized for issuance and, when executed and delivered by the Company, will be a valid and binding obligation of the Company in accordance with its terms; and (iii) the Warrant Shares have been duly authorized for issuance and, when issued and paid for in accordance with the terms and conditions of the Warrant, will be validly issued, fully paid and non-assessable.

We hereby consent to the filing of this opinion with the Commission as an exhibit to the Registration Statement in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act and to the use of our name therein and in the related Prospectus under the caption "Legal Matters." In giving such consent, we do not hereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission. This opinion is expressed as of the date hereof, and we disclaim any undertaking to advise you of any subsequent changes in the facts stated or assumed herein or of any subsequent changes in applicable law.

Very truly yours,

/s/ Gracin & Marlow, LLP

Gracin & Marlow, LLP

Heat Biologics

November 3, 2011

Jennifer Harris, Ph.D.
4430 Sun Valley Drive
Durham, NC

Dear Jennifer,

On behalf of Heat Biologics, Inc. ("Heat"), I am pleased to extend an offer of employment to you as Senior Director of Clinical Development under the following terms and conditions:

1. Start date: December 1, 2011

2. Base salary of $150,000 per year, payable bi-weekly.

3. Heat has granted you 50,000 ten-year options to purchase common stock in Heat Biologics at the most recent fair market value for Heat's common stock as determined by the Heat's board, which we estimate to be $0.28 per share. These options will vest quarterly over a 4 year period.

4. Three weeks vacation per year plus 5 days sick leave plus standard national holidays.

5. You will be required to sign a Confidentiality Agreement as well as an Assignment of Inventions Agreement provided in Appendix A.

6. Heat will hold you harmless for any activities you perform within the scope of your employment.

Please acknowledge your acceptance of this offer by your signature below. I am very enthused at having you on board and very much look forward to working with you to build a truly exciting new venture!

Sincerely,

Jeff Wolf
CEO
Heat Biologics, Inc.

Agreed and Accepted,

Jennifer Harris, Ph.D.

APPENDIX A

CONFIDENTIAL INFORMATION AND ASSIGNMENT OF INVENTIONS

All Developments (as defined below), whether or not reduced to writing, which the employee may originate, make or conceive during the term of his employment and for a period of one (1) month thereafter, either alone or with others and whether or not during working hours or by the use of facilities of the Corporation shall immediately become the sole and absolute property of the Corporation.

The term “Development” shall mean any invention, modification, discovery, design, development, improvement, process, software program, work of authorship, documentation, formula, data, technique, know-how, trade secret or intellectual property right whatsoever or any interest therein (whether or not patentable or registrable under copyright, trademark or similar statutes).

The employee agrees to disclose promptly to the Corporation (or any persons designated by it) each such Development. The employee hereby assigns all rights (including, but not limited to, rights to inventions, patentable subject matter, copyrights and trademarks) that he may have or may acquire in the Developments and all benefits and/or rights resulting therefrom to the Corporation and its assigns without further compensation and hereby agrees to communicate, without cost or delay, and without disclosing to others the same, all available information relating thereto (with all necessary plans and models) to the Corporation.

The employee agrees that, during his employment and at any time thereafter, at the request and cost of the Corporation, promptly sign, execute, make and do all such deeds, documents, acts and things as the Corporation and its duly authorized officers may reasonably require:

(a) to apply for, obtain, register and vest in the name of the Corporation alone (unless the Corporation otherwise directs) patents, copyrights, trademarks or other analogous protection in any country throughout the world relating to a Development and when obtained or vested to renew and restore the same; and

(b) to defend any judicial, opposition or other proceedings in respect of such application for revocation of any such patent, copyright, trademark or other analogous protection; and

(c) if the Corporation is unable, after reasonable effort, to secure my signature on any application for patent, copyright, trademark or other analogous registration or other documents regarding any legal protection relating to a Development, whether because of my physical or mental incapacity or for any other reason whatsoever, and hereby irrevocably designates and appoints the Corporation and its duly authorized officers and agents as my agent and attorney-in-fact, to act for and in his behalf and stead to execute and file any such application or applications or other documents and to do all other lawfully permitted acts to further the prosecution and issuance of patent, copyright or trademark registrations or any other legal protection with the same legal force and effect as if executed by him.

(d) The employee further agrees that during the course of his employment or at any time after termination, he/she will not disclose or make accessible to any other person, the Corporation's products, services and technology, both current and under development,

promotion and marketing programs, lists, trade secrets and other confidential and proprietary business information of the Corporation or any of its clients. The employee agrees: (i) not to use any such information for himself or others; and (ii) not to take any such material or reproductions thereof from the Corporation's facilities at any time during his employment by the Corporation, except as required in the employee's duties to the Corporation. The employee agrees immediately to return all such material and reproductions thereof in his possession to the Corporation upon request and in any event upon termination of employment. The foregoing notwithstanding, the parties acknowledge and agree that the confidential and proprietary information of the Corporation and/or its clients shall not include the following: (a) information already in the public domain or hereafter disclosed to the public through no fault of the employee; including but not limited to knowledge of (i) the business of other companies in the field, (ii) general business methods and structures useful in operating biotechnology companies, (iii) the status of patents and other technology in the field other than those of the Company; (b) general knowledge about the biotechnology field obtained through the employee's professional and academic experience, or (c) specific ideas and projections of the biotechnology field's evolution that are not the property of the Corporation.

(e) Except with prior written authorization by the Corporation, the employee agrees not to disclose or publish any of the confidential, technical or business information or material of the Corporation, its clients or any other party to whom the Corporation owes an obligation of confidence, at any time during or after his employment with the Corporation.

(f) employee acknowledges that all original works of authorship that are made by him (solely or jointly with others) within the scope of his employment and that are protectable by copyright are being created at the instance of the Corporation and are “works made for hire,” as that term is defined in the United State Copyright Act (17 USCA, Section 101). If these laws are inapplicable or in the event that all or a part of any works are determined by a court of competent jurisdiction not to be a work made for hire under the United States copyright laws, this Agreement will operate as an irrevocable and unconditional assignment by him to the Corporation of all of his right, title and interest (including without limitation all rights in and to the copyrights throughout the world, including the right to prepare derivative works and the right to all renewals and extensions) in the works in perpetuity.

Sincerely,

Jeff Wolf
CEO
Heat Biologics, Inc.

Agreed and Accepted,

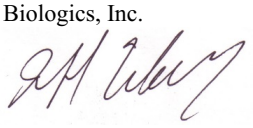
Jennifer Harris, Ph.D.

FIRST AMENDMENT OF THE EMPLOYMENT AGREEMENT BETWEEN
Jennifer Harris ("Harris") and Heat Biologics Inc. ("Heat") dated November 3, 2011

Effective May 1, 2013, the terms of employment will be changed as follow:

1. Harris shall receive a base salary of $75,000 per year, payable bi-weekly beginning May 1, 2013.
2. Heat shall grant Harris an additional grant of 20,000 ten-year options to purchase common stock in Heat at the most recent fair market value for Heat's common stock as determined by its Board, which is estimated to be $0.97 per share, pursuant to Heat's 2009 Stock Incentive Plan. These options will vest quarterly over a 4 year period.
3. Heat shall pay Harris the balance of her current accumulated vacation pool, which amount is _____ hours, distributed evenly over the remaining pay periods of 2013 beginning with the pay period following the effective date of this agreement.
4. Vacation will be accrued at 10 days per year beginning May 10, 2013.
5. All other terms of the original employment agreement shall remain in full force and effect including Heat's grant of the Incentive Stock Option for 50,000 shares, which grant has been documented by Notice of Incentive Stock Option under the 2009 Stock Incentive Plan showing a grant date of November 22, 2011("Grant"), and Heat agrees to honor the vesting schedule set forth in the Grant and all other rights given to Harris therein.

Heat Biologics, Inc.

By: 

Title: CEO

Jennifer Harris, PharmD

_____

EXHIBIT 10.31

EMPLOYMENT AGREEMENT

THIS EMPLOYMENT AGREEMENT (the "**Agreement**"), dated as of May 15, 2013 (the "**Effective Date**"), by and between Heat Biologics, Inc., a Delaware corporation having a place of business at 100 Europa Drive, Suite 420, Chapel Hill, NC 27517 (the "**Corporation**"), and Matthew E. Czajkowski (the "**CFO**"), an individual residing at 1083 Burning Tree Drive, Chapel Hill, NC 27517.

W I T N E S S E T H:

WHEREAS, the Corporation and the CFO desire to set forth the terms and conditions on which, from and after the Effective Date, (i) the Corporation shall employ the CFO, (ii) the CFO shall render services to the Corporation, and (iii) the Corporation shall compensate the CFO for such services.

NOW, THEREFORE, in consideration of the foregoing and the mutual promises and covenants herein contained, the parties agree as follows:

1. EMPLOYMENT; DUTIES

(a) The Corporation engages and employs the CFO, and the CFO hereby accepts engagement and employment, as part time Chief Financial Officer of the Corporation. The CFO shall perform such services and duties as are normally incident to such positions and are commensurate with the CFO's background, education and professional standing, all as the Board of Directors of the Corporation shall reasonably determine.

(b) The CFO shall perform his duties hereunder from the Corporation's principal office; provided, however, that the CFO acknowledges and agrees that the performance by the CFO of his duties hereunder may require some domestic and international travel by the CFO.

(c) The Corporation and CFO agree that CFO's position shall be part-time and CFO shall not be required to devote more than 50% of the time that a full time equivalent would spend per week in performance of services to the Corporation. The Corporation acknowledges and agrees that CFO may perform services for other companies or non-profit institutions provided that CFO does not breach the terms of this Agreement.

(d) CFO agrees that he is subject to and will comply with the policies and procedures of the Corporation; as such policies and procedures may be modified, added to or eliminated from time to time at the sole discretion of the Corporation (and provided such revised policies and procedures are communicated to CFO), except to the extent any such policy or procedure specifically conflicts with the express terms of this Agreement. CFO further agrees and acknowledges that any written or oral policies and procedures of the Corporation do not constitute contracts between the Corporation and CFO.

2. TERM

It is understood and agreed by the Corporation and CFO that this Agreement does not contain any promise or representation concerning the duration of CFO's employment with the Corporation. CFO specifically acknowledges that his employment with the Corporation is at-will and may be altered or terminated by either CFO or the Corporation at any time, with or without cause and/or with or without notice. The nature, terms or conditions of CFO's employment with the Corporation cannot be changed by any oral representation, custom, habit or practice, or any other writing, except an Amendment to this Agreement. In addition, if any references to the rate of salary, any bonuses, paid time off, other compensation, or vesting schedules are stated in units of years or months or weeks these references do not alter the at-will nature of the employment, and does not mean and should not be interpreted to mean that CFO is guaranteed employment to the end of any period of time or for any period of time. In the event of conflict between this disclaimer and any other statement, oral or written, present or future, concerning terms and conditions of employment, the at-will relationship confirmed by this disclaimer shall control, unless there is an Amendment to this Agreement.

3. COMPENSATION

(a) Base Salary. For all services rendered and to be rendered hereunder, the Corporation agrees to pay to the CFO, and the CFO agrees to accept a salary of $105,000 per annum ("**Base Salary**"), which will be paid bi-weekly in accordance with normal Corporation payroll practices and shall be subject to such deductions or withholdings as the Corporation is required to make pursuant to law, or by further agreement with the CFO. The Corporation and CFO agree that if CFO's work schedule increases to more than 50% of the time that a full time equivalent would spend performing services for the Corporation, then CFO and Corporation will mutually agree to an increase in CFO's salary. CFO's salary shall be subject to annual review and adjustment by the Board of Directors, but shall not be decreased without the agreement of the CFO.

(b) Stock Options. The Corporation will grant CFO an option to purchase 88,235 shares of the common stock of Corporation. These options will have a 10 year life and will vest monthly over a 3-year period and will be granted at an exercise price of $3.83 per share. The Option Agreement will provide that if, after CFO has been employed by the Corporation for one year, there is a Change in Control (as defined in the Option Agreement) then all options will become fully vested immediately prior to the Change in Control.

(c) Bonus. CFO shall be eligible to receive an annual performance bonus ("Bonus") based upon CFO's achievement of certain milestones and performance objectives established by the Corporation and CFO. The Board of Directors or the Compensation Committee, in its sole discretion, shall determine the extent to which CFO has achieved the performance targets upon which CFO's Bonus is based, and the amount of Bonus to be paid to CFO, if any. Bonuses are not earned until they are approved by the Board of Directors or Compensation Committee. Corporation agrees to work with CFO to determine the objectives to be achieved by CFO for the remainder of 2013 on or before July 1, 2013 and by January 30, 2014 for fiscal year 2014.

(d) CFO Benefits. Upon reaching full-time employment status, the CFO shall be entitled to all benefits to which other executive officers of the Corporation are entitled, on terms comparable thereto, including, without limitation, participation in pension and profit sharing plans, 401(k) plan, group insurance policies and plans, medical, health, vision, and disability insurance policies and plans, and the like, which may be maintained by the Corporation for the benefit of its executives. The Corporation reserves the right to alter and amend the benefits received by CFO from time to time at the Corporation's discretion.

(e) Vacation. CFO will be entitled to three weeks' paid vacation per year.

4. REPRESENTATIONS AND WARRANTIES BY THE CFO AND CORPORATION

The CFO hereby represents and warrants to the Corporation that CFO has the full right, power and legal capacity to enter and deliver this Agreement and to perform his duties and other obligations hereunder. This Agreement constitutes the legal, valid and binding obligation of the CFO enforceable against him in accordance with its terms.

The Corporation hereby represents and warrants to the CFO as follows:

(a) The Corporation is duly organized, validly existing and in good standing under the laws of the State of Delaware, with all requisite corporate power and authority to own its properties and conduct its business in the manner presently contemplated.

(b) The Corporation has full power and authority to enter into this Agreement and to incur and perform its obligations hereunder.

(c) The execution, delivery and performance by the Corporation of this Agreement does not conflict with or result in a breach or violation of or constitute a default under (whether immediately, upon the giving of notice or lapse of time or both) the certificate of incorporation or bylaws of the Corporation, or any agreement or instrument to which the Corporation is a party or by which the Corporation of any of its properties may be bound or affected.

5. NON-COMPETITION

(a) The CFO understands and recognizes that his services to the Corporation are special and unique and agrees that during the term of this Agreement and during the Non-Compete period, he shall not in any manner, directly, on behalf of himself or any person, firm, partnership, joint venture, corporation or other business entity ("**Person**"), enter into or engage in any business developing cancer vaccine technologies similar to the technologies under development by the Corporation, either as an individual for his own account, or as a partner, joint venturer, executive, agent, consultant, salesperson, officer, director, employee or shareholder of any Person. Recognizing that the Corporation intends to operate on a worldwide basis, these restrictions shall apply to the entire world (or if that is deemed by a court of competent jurisdiction to be unreasonable, then to North America, the European Union and Japan, and if that is deemed unreasonable, then to North America alone). The CFO agrees and

acknowledges that the time limitation on the restrictions in this Paragraph 5, combined with the geographic scope, is reasonable. The CFO also acknowledges and agrees that Paragraph 5 is reasonably necessary for the protection of the Corporation, that through his employment the CFO shall receive adequate consideration for any loss of opportunity associated with the provisions herein, and that these provisions provide a reasonable way of protecting Corporation's business value which will be imparted to the CFO.

(b) During the Non-Compete Period, the CFO shall not interfere with or disrupt or attempt to disrupt the Corporation's business relationship with any of its customers, affirmatively suggest or propose that any of the employees of the Corporation leave such employment, or retain, help retain, or participate in retaining any then-current employees of the Corporation.

(c) The Non-Compete Period shall mean the period of time beginning on the date of the CFO's termination and ending nine (9) calendar months following such termination.

(d) In the event that the CFO breaches any provisions of this Paragraph 5 or there is a threatened breach of this Paragraph 5, then, in addition to any other rights which the Corporation may have, the Corporation shall be entitled, without the posting of a bond or other security, to injunctive relief to enforce the restrictions contained herein. In the event that an actual proceeding is brought in equity to enforce the provisions of this Paragraph 5, the CFO shall not argue as a defense that there is an adequate remedy at law nor shall the Corporation be prevented from seeking any other remedies which may be available.

6. INVENTIONS ASSIGNMENTS; CONFIDENTIAL INFORMATION

All inventions, improvements, ideas, names, patents, trademarks, copyrights, and innovations (including all data and records pertaining thereto), whether or not reduced to writing, which the CFO may originate, make or conceive during the term of his employment and for a period of three (3) months thereafter, either alone or with others and whether or not during working hours or by the use of facilities of the Corporation (except as may be originated made or conceived in connection with his consulting obligations pursuant to Paragraph 1(c) of this Agreement), and which relate to or are or may likely be useful in connection with the business or contemplated business of the Corporation shall be the exclusive property of the Corporation.

The CFO agrees that during the course of his employment or at any time after termination, he will not disclose or make accessible to any other person, the Corporation's products, services and technology, both current and under development, promotion and marketing programs, lists, trade secrets and other confidential and proprietary business information of the Corporation or any of its clients. The CFO agrees: (i) not to use any such information for himself or others; and (ii) not to take any such material or reproductions thereof from the Corporation's facilities at any time during his employment by the Corporation, except as required in the CFO's duties to the Corporation. The CFO agrees immediately to return all such material and reproductions thereof in his possession to the Corporation upon request and in any event upon termination of employment. The foregoing notwithstanding, the parties acknowledge and agree that the confidential and proprietary information of the Corporation

and/or its clients shall not include the following: (a) information already in the public domain or hereafter disclosed to the public through no fault of the CFO; including but not limited to knowledge of (i) the business of other companies in the field, (ii) general business methods and structures useful in operating biomaterials companies, (iii) the status of patents and other technology in the field other than those of the Corporation; (b) general knowledge about the biomaterials field obtained through the CFO's academic experience, or (c) specific ideas and projections of the biomaterials field's evolution.

Except with prior written authorization by the Corporation, the CFO agrees not to disclose or publish any of the confidential, technical or business information or material of the Corporation, its clients or any other party to whom the Corporation owes an obligation of confidence, at any time during or after his employment with the Corporation.

7. TERMINATION

(a) Subject to Paragraph 2 above, the CFO's employment hereunder shall begin on the Effective Date and shall continue thereafter until terminated upon the first to occur of the following events:

(i) the death of the CFO or the Disability of the CFO, as defined below; or

(ii) termination by the Board of Directors of the Corporation, either with or without Cause (as defined below); or

(iii) voluntary resignation by the CFO after providing the Corporation with at least thirty days prior written notice.

(b) Upon termination pursuant to clause (a)(i) above and provided that the CFO (or his estate) first executes and does not revoke a release and settlement agreement in the form acceptable to the CFO and the Corporation releasing the Corporation from all claims arising from his employment within sixty (60) days of his termination, the CFO (or his estate in the event of termination as a result of the death of the CFO) shall immediately be entitled to receive all unpaid salary and accrued and unpaid vacation up to the date of termination pursuant to clause (a)(i) plus a pro-rata portion of the Bonus. In addition, such number of options to purchase shares that would have vested upon the date of termination pursuant to clause (a)(i) shall immediately vest.

Upon termination pursuant to clause (a)(ii) for any reason other than for Cause (as defined below) and provided that the CFO first executes and does not revoke a release and settlement agreement in the form acceptable to the CFO and the Corporation releasing the Corporation from all claims related to his employment within sixty (60) days of his termination, the CFO shall immediately be entitled to receive three (3) months salary paid in a lump sum, all unpaid salary and accrued and unpaid vacation and any other compensation or benefits required under applicable law. In addition, all options to purchase Common Stock that would have vested through the one year period after the date of termination pursuant to clause (a)(ii) shall immediately vest.

(c) "**Disability**" of the CFO shall be deemed to have occurred if the CFO, by virtue of any injury, sickness, or physical condition is unable to perform substantially and continuously the duties assigned to him hereunder for more than sixty (60) consecutive or non-consecutive days out of any consecutive twelve (12) month period, exclusive of any accrued vacation.

(d) Upon termination by the Corporation during the Term pursuant to clause (a)(ii) with Cause or upon the voluntary resignation of the CFO pursuant to clause (a)(iii), such termination shall be effective immediately or on the effective date of the CFO's notice, as the case may be, and the CFO will be paid all accrued but unpaid salary due as of the Termination Date and all accrued but unpaid vacation and shall receive all options that have vested through the date of termination pursuant to clause (a)(ii).

(e) For purposes of this Agreement, "**Cause**" shall mean the unlawful conduct of the CFO constituting a felony under the law or dishonest conduct of the CFO involving moral turpitude or causing material harm to the Corporation; willful, reckless or grossly negligent misconduct; or insubordination which is injurious to, or is reasonably likely to be injurious to, the Corporation, monetarily or otherwise, and which continues after written notice thereof by the Board of Directors.

8. NOTICES

All notices required to be given pursuant to this Agreement shall be in writing and shall be deemed given if personally delivered to the other party or if sent by email, the United States Mail, certified mail/return receipt requested, postage pre-paid or by a nationally recognized overnight carrier service, delivery charges prepaid. All such notices shall be addressed to the receiving party at the address set forth in the opening paragraph of this Agreement or such other address as such be provided by written notice pursuant to this Paragraph 8.

9. SEVERABILITY OF PROVISIONS

If any provision of this Agreement shall be declared by a court of competent jurisdiction to be invalid, illegal or incapable of being enforced in whole or in part, the remaining conditions and provisions or portions thereof shall nevertheless remain in full force and effect and enforceable to the extent they are valid, legal and enforceable, and no provision shall be deemed dependent upon any other covenant or provision unless so expressed herein.

10. ENTIRE AGREEMENT; MODIFICATION

This Agreement contains the entire agreement of the parties relating to the subject matter hereof, and the parties hereto have made no agreements, representations or warranties relating to the subject matter of this Agreement which are not set forth herein. No modification of this Agreement shall be valid unless made in writing and signed by the parties hereto.

11. BINDING EFFECT

The rights, benefits, duties and obligations under this Agreement shall inure to, and be binding upon, the Corporation, its successors and assigns, and upon the CFO and his heirs and legal representatives. This Agreement constitutes a personal service agreement, and the performance of the CFO's obligations hereunder may not be transferred, delegated or assigned by the CFO.

12. NON-WAIVER

The failure of either party to insist upon the strict performance of any of the terms, conditions and provisions of this Agreement shall not be construed as a waiver or relinquishment of future compliance therewith, and said terms, conditions and provisions shall remain in full force and effect. No waiver of any term or condition of this Agreement on the part of either party shall be effective for any purpose whatsoever unless such waiver is in writing and signed by such party.

13. GOVERNING LAW; WAIVER OF JURY TRIAL

This Agreement shall be governed by, and construed and interpreted in accordance with, the laws of the State of North Carolina without regard to principles of conflict of laws. Any and all disputes, claims or controversies of any kind between the parties arising from or relating in any way to this Agreement or the interpretation, breach, termination, validity, or existence hereof, shall be finally settled by binding arbitration held in Chapel Hill, NC in accordance with the Employment Arbitration Rules of the American Arbitration Association. The arbitration shall take place before a single arbitrator appointed by the American Arbitration Association. With respect to any judgment, award, order or similar findings (including, without limitation, interim awards) of such arbitrators, the parties hereby agree that such judgment, award, order or similar findings shall be final and binding on the parties and shall not be subject to appeal by either party. Judgment upon any judgment, award, order or similar findings of the arbitrators (including, without limitation, interim awards) made in connection with this Paragraph 13 may be entered in any court having jurisdiction over such judgment, award, order or similar findings, or over either of the parties or any of their respective assets, and application may be made to such court for confirmation, enforcement, and/or execution of such judgment, award, order or similar findings. The Parties irrevocably waive all rights to a trial by jury in any suit, action, or other proceeding hereafter instituted by or against such party in respect of its obligations hereunder or the transactions contemplated hereby.

14. INDEMNIFICATION.

As additional consideration for the CFO's agreement to perform the duties outlined herein, the CFO shall be indemnified and held harmless by the Corporation for any and all claims, costs or expenses including legal fees and advancement of expenses, except in the case of willful, reckless or grossly negligent misconduct, for any activity in any suit brought against him or the Corporation for actions undertaken by CFO on behalf of the Corporation to the maximum extent provided by law, regardless of whether such indemnification is specifically authorized by statute, the Corporation's Articles of Incorporation or Bylaws or any other agreement.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

Heat Biologics, Inc.

By: Jeffrey Wolf

Signature: /s/ Jeffrey Wolf
Title: CEO

Chief Financial Officer

/s/ Matthew E. Czajkowski
Matthew E. Czajkowski

EXHIBIT 10.32

Form of Lock-Up Agreement

_____, 2013

Aegis Capital Corp.
810 Seventh Avenue, 18th Floor
New York, New York 10019

Ladies and Gentlemen:

The undersigned understands that Aegis Capital Corp. (the "**Representative**") proposes to enter into an Underwriting Agreement (the "**Underwriting Agreement**") with Heat Biologics, Inc., a Delaware corporation (the "**Company**"), providing for the public offering (the "**Public Offering**") of shares of common stock, par value $0.0001 per share, of the Company (the "**Shares**").

To induce the Representative to continue its efforts in connection with the Public Offering, the undersigned hereby agrees that, without the prior written consent of the Representative, the undersigned will not, during the period commencing on the date hereof and ending 180 days after the date of the final prospectus (the "**Prospectus**") relating to the Public Offering (the "**Lock-Up Period**"), (1) offer, pledge, sell, contract to sell, grant, lend, or otherwise transfer or dispose of, directly or indirectly, any Shares or any securities convertible into or exercisable or exchangeable for Shares, whether now owned or hereafter acquired by the undersigned or with respect to which the undersigned has or hereafter acquires the power of disposition (collectively, the "**Lock-Up Securities**"); (2) 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 Lock-Up Securities, whether any such transaction described in clause (1) or (2) above is to be settled by delivery of Lock-Up Securities, in cash or otherwise; (3) make any demand for or exercise any right with respect to the registration of any Lock-Up Securities; or (4) publicly disclose the intention to make any offer, sale, pledge or disposition, or to enter into any transaction, swap, hedge or other arrangement relating to any Lock-Up Securities. Notwithstanding the foregoing, and subject to the conditions below, the undersigned may transfer Lock-Up Securities without the prior written consent of the Representative in connection with (a) transactions relating to Lock-Up Securities acquired in open market transactions after the completion of the Public Offering; provided that no filing under Section 16(a) of the Securities Exchange Act of 1934, as amended (the "**Exchange Act**"), shall be required or shall be voluntarily made in connection with subsequent sales of Lock-Up Securities acquired in such open market transactions; (b) transfers of Lock-Up Securities as a *bona fide* gift, by will or intestacy or to a family member or trust for the benefit of a family member (for purposes of this lock-up agreement, "family member" means any relationship by blood, marriage or adoption, not more remote than first cousin); (c) transfers of Lock-Up Securities to a charity or educational institution; or (d) if the undersigned, directly or indirectly, controls a corporation, partnership, limited liability company or other business entity, any transfers of Lock-Up Securities to any shareholder, partner or member of, or owner of similar equity interests in, the undersigned, as the case may be; provided that in the case of any transfer pursuant to the foregoing clauses (b), (c) or (d), (i) any such transfer shall not involve a disposition for value, (ii) each transferee shall sign and deliver to the Representative a lock-up agreement substantially in the form of this lock-up agreement and (iii) no filing under Section 16(a) of the Exchange Act shall be required or shall be voluntarily made. The undersigned also agrees and consents to the entry of stop transfer instructions with the Company's transfer agent and registrar against the transfer of the undersigned's Lock-Up Securities except in compliance with this lock-up agreement.

If (i) during the last 17 days of the Lock-Up Period, the Company issues an earnings release or material news or a material event relating to the Company occurs, or (ii) prior to the expiration of the Lock-Up Period, the Company announces that it will release earnings results or becomes aware that material news or a material event will occur during the 16-day period beginning on the last day of the Lock-Up Period, the restrictions imposed by this lock-up agreement shall continue to apply until the expiration of the 18-day period beginning on the issuance of the earnings release or the occurrence of such material news or material event, as applicable, unless the Representative waives, in writing, such extension; *provided, however*, that this extension of the Lock-Up Period shall not apply to the extent that FINRA has amended or repealed NASD Rule 2711(f)(4), or has otherwise provided written interpretive guidance regarding such rule, in each case, so as to eliminate the prohibition of any broker, dealer, or member of a national securities association from publishing or distributing any research report, with respect to the securities of an Emerging Growth Company prior to or after the expiration of any agreement between the broker, dealer, or member of a national securities association and the Emerging Growth Company or its shareholders that restricts or prohibits the sale of securities held by the Emerging Growth Company or its shareholders after the initial public offering date.

The undersigned agrees that, prior to engaging in any transaction or taking any other action that is subject to the terms of this lock-up agreement during the period from the date hereof to and including the 34th day following the expiration of the initial Lock-Up Period, the undersigned will give notice thereof to the Company and will not consummate any such transaction or take any such action unless it has received written confirmation from the Company that the Lock-Up Period (as may have been extended pursuant to the previous paragraph) has expired.

If the undersigned is an officer or director of the Company, (i) the undersigned agrees that the foregoing restrictions shall be equally applicable to any issuer-directed or "friends and family" Shares that the undersigned may purchase in the Public Offering; (ii) the Representative agrees that, at least three (3) business days before the effective date of any release or waiver of the foregoing restrictions in connection with a transfer of Lock-Up Securities, the Representative will notify the Company of the impending release or waiver; and (iii) the Company has agreed in the Underwriting Agreement to announce the impending release or waiver by press release through a major news service at least two (2) business days before the effective date of the release or waiver. Any release or waiver granted by the Representative hereunder to any such officer or director shall only be effective two (2) business days after the publication date of such press release. The provisions of this paragraph will not apply if (a) the release or waiver is effected solely to permit a transfer of Lock-Up Securities not for consideration and (b) the transferee has agreed in writing to be bound by the same terms described in this lock-up agreement to the extent and for the duration that such terms remain in effect at the time of such transfer.

No provision in this agreement shall be deemed to restrict or prohibit the exercise, exchange or conversion by the undersigned of any securities exercisable or exchangeable for or convertible into Shares, as applicable; provided that the undersigned does not transfer the Shares acquired on such exercise, exchange or conversion during the Lock-Up Period, unless otherwise permitted pursuant to the terms of this lock-up agreement. In addition, no provision herein shall be deemed to restrict or prohibit the entry into or modification of a so-called "10b5-1" plan at any time (other than the entry into or modification of such a plan in such a manner as to cause the sale of any Lock-Up Securities within the Lock-Up Period).

The undersigned understands that the Company and the Representative are relying upon this lock-up agreement in proceeding toward consummation of the Public Offering. The undersigned further understands that this lock-up agreement is irrevocable and shall be binding upon the undersigned's heirs, legal representatives, successors and assigns.

The undersigned understands that, if the Underwriting Agreement is not executed by September 30, 2013, or if the Underwriting Agreement (other than the provisions thereof which survive termination) shall terminate or be terminated prior to the initial closing date of the Shares to be sold thereunder, then this lock-up agreement shall be void and of no further force or effect.

Whether or not the Public Offering actually occurs depends on a number of factors, including market conditions. Any Public Offering will only be made pursuant to an Underwriting Agreement, the terms of which are subject to negotiation between the Company and the Representative.

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: _____

_____

_____

EXHIBIT 10.33

AGREEMENT

This Agreement (this "**Agreement**"), dated as of May 23, 2013, is entered into by and among Heat Biologics, Inc., a Delaware corporation (the "**Company**"), and the several undersigned purchasers (individually, a "**Purchaser**" and collectively, the "**Purchasers**"). Certain capitalized terms used herein are defined in the Series B Preferred Stock Purchase Agreement (the "**SPA**"), dated as of March 25, 2013, entered into by and among the Company and the Purchasers.

RECITALS

A. **WHEREAS**, the Company and the Purchasers are parties to the SPA, pursuant to which the Purchasers acquired shares of Series B-1 Preferred Stock, par value $0.0001 per share, and committed to make an additional investment in the Company and acquire shares of Series B-2 Preferred Stock and warrants upon fulfillment of certain conditions set forth in the SPA.

B. **WHEREAS**, the Company has filed a registration statement with the Securities and Exchange Commission for its initial public offering of its common stock (the "IPO") for which Aegis Capital Corp. ("Aegis") is acting as the representative of the underwriters.

C. **WHEREAS**, to facilitate the IPO, the Company has requested that certain amendments be made to the SPA.

D. **WHEREAS**, the Purchasers desire to facilitate the IPO and approve and effect the requested changes.

NOW, THEREFORE, in consideration of the premises and the covenants contained herein, and to facilitate the IPO and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, and intending to be legally bound, the parties hereby agree as follows:

1. Notwithstanding anything to the contrary that may be contained in the SPA, each Purchaser's obligation to acquire, and the Company's obligation to issue, Series B-2 Shares and Warrants under the SPA shall hereby be terminated effective immediately and automatically upon the consummation of a Qualified Public Offering (as defined in the Company's Third Amended and Restated Certificate of Incorporation), and any provisions of the SPA providing for or otherwise contemplating the acquisition or issuance of the Series B-2 Shares or Warrants shall be deemed to have no further force or effect, ***ab initio,*** regardless of whether or not any stated or otherwise contemplated condition to their acquisition or issuance is met at a future date. In consideration thereof, the Company hereby agrees to issue to the Purchasers, on a ***pro rata*** basis, based on their respective shares of Series B-1 Preferred Stock so owned, upon the consummation of a Qualified Public Offering, a number of shares of common stock having an aggregate value equal to $361,668, to be calculated based upon the initial public offering price in the Qualified Public Offering.

2. Each Purchaser shall execute a lock up agreement provided by Aegis in the form attached hereto as Exhibit A.

3. The SPA and the exhibits and schedules thereto, as amended by this Agreement, contains the entire agreement between the parties hereto regarding the subject matter thereof, and there are no agreements, warranties or representations which are not set forth therein or herein. This

Agreement may not be modified or amended except by an instrument in writing duly signed by or on behalf of the parties hereto.

4. This Agreement shall be governed by and construed and enforced in accordance with the laws of the State of Delaware applicable to agreements made and to be performed entirely within the State, without regard to conflict of laws principles.

5. This Agreement shall be binding upon the parties and inure to the benefit of the successors and assigns of the respective parties hereto; provided, however, that neither this Agreement nor any of the rights hereunder may be assigned by any of the Purchasers hereto without the prior written consent of the Company .

6. This Agreement may be executed simultaneously in any number of counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

7. In the event of any conflict between the terms or provisions of this Agreement and the SPA, then this Agreement shall prevail in all respects.

8. Notwithstanding anything contained herein to the contrary, in the event a Qualified Public Offering is not consummated on or before December 31, 2013, this Agreement shall terminate and be of no force or effect whatsoever (i.e., the rights and obligations of the parties shall be as though this Agreement never existed).

HEAT BIOLOGICS, INC.

By: _____

Name: Jeff Wolf

Title: President

PURCHASER:

_____
INSERT NAME OF PURCHASER

By: _____

Name:

Title:

Number of Shares held by Purchaser and Class of Preferred Stock held _____

EXHIBIT 23.1

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

Heat Biologics, Inc. and Subsidiaries
(A Development Stage Company)
Chapel Hill, North Carolina

We hereby consent to the use in the Prospectus constituting a part of this Registration Statement of our report dated April 8, 2013, relating to the consolidated financial statements of Heat Biologics, Inc. and Subsidiaries, which is contained in that Prospectus.

We also consent to the reference to us under the caption “Experts” in the Prospectus.

/s/ BDO USA, LLP
Raleigh, North Carolina

May 30, 2013