HEMISPHERX BIOPHARMA INC
Form 10-K
March 29, 2011

FORM 10-K
SECURITIES AND EXCHANGE COMMISSION
x ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2010
OR
¨ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934
For the transition period from _____ to _____
Commission File No. 1-13441

HEMISPHERX BIOPHARMA, INC.
(Exact name of registrant as specified in its charter)

Delaware	52-0845822
(State or other jurisdiction of incorporation or organization)	(I.R.S. Employer Identification Number)

1617 JFK Boulevard Philadelphia, Pennsylvania	19103
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (215) 988-0080

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

Common Stock, $.001 par value

Securities registered pursuant to Section 12(g) of the Act:
(Title of Each Class)
NONE

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

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

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

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

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

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one): o Large accelerated filer x Accelerated filer ¨ Non-accelerated filer ¨ Smaller Reporting Company ¨

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

The aggregate market value of Common Stock held by non-affiliates at June 30, 2010, the last business day of the registrant's most recently completed second fiscal quarter was $61,726,769.

The number of shares of the registrant's Common Stock outstanding as of March 1, 2011 was 135,241,609.

DOCUMENTS INCORPORATED BY REFERENCE: None.

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SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

Certain statements in this Annual Report on Form 10-K (the "Form 10-K"), including statements under "Item 1. Business," "Item 1A. Risk Factors," "Item 3. Legal Proceedings" and "Item 6. Management's Discussion and Analysis of Financial Condition and Result of Operations", constitute "forward-looking statements" within the meaning of Section 27A of the Securities Act of 1933, as amended (the "Securities Act"), and Section 21E of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the Private Securities Litigation Reform Act of 1995 (collectively, the "Reform Act"). Certain, but not necessarily all, of such forward-looking statements can be identified by the use of forward-looking terminology such as "believes", "expects", "may", "will", "should", or "anticipates" or the negative there other variations thereon or comparable terminology, or by discussions of strategy that involve risks and uncertainties. All statements other than statements of historical fact included in this Form 10-K regarding our financial position, business strategy and plans or objectives for future operations are forward-looking statements. Without limiting the broader description of forward-looking statements above, we specifically note that statements regarding potential drugs, their potential therapeutic effect, the possibility of obtaining regulatory approval, our ability to manufacture and sell any products, market acceptance or our ability to earn a profit from sales or licenses of any drugs or our ability to discover new drugs in the future are all forward-looking in nature.

Such forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Hemispherx Biopharma, Inc. and its subsidiaries (collectively, "Hemispherx", "Company", "we or "us") to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements and other factors referenced in this Form 10-K. We do not undertake and specifically decline any obligation to publicly release the results of any revisions which may be made to any forward-looking statement to reflect events or circumstances after the date of such statements or to reflect the occurrence of anticipated or unanticipated events.

PART I

ITEM 1. Business.

GENERAL

We are a specialty pharmaceutical company based in Philadelphia, Pennsylvania and engaged in the clinical development of new drug therapies based on natural immune system enhancing technologies for the treatment of viral and immune based chronic disorders. We were founded in the early 1970s doing contract research for the National Institutes of Health. Since that time, we have established a strong foundation of laboratory, pre-clinical and clinical data with respect to the development of natural interferon and nucleic acids to enhance the natural antiviral defense system of the human body and to aid the development of therapeutic products for the treatment of certain chronic diseases. We have three domestic subsidiaries BioPro Corp., BioAegean Corp., and Core BioTech Corp., all of which are incorporated in Delaware and are dormant. Our foreign subsidiary is Hemispherx Biopharma Europe N.V./S.A. established in Belgium in 1998, which has minimal activity. All significant intercompany balances and transactions have been eliminated in consolidation.

Our current strategic focus is derived from four applications of our two core pharmaceutical technology platforms Ampligen® and Alferon N Injection®. The commercial focus for Ampligen® includes application as a treatment for Chronic Fatigue Syndrome ("CFS") and as an influenza vaccine enhancer (adjuvant) for both therapeutic and preventative vaccine development. Alferon N Injection® is a Food and Drug Administration ("FDA") approved product with an indication for refractory or recurring genital warts. Alferon® LDO (Low Dose Oral) is a formulation currently under development targeting influenza.

We own and operate a 43,000 sq. ft. FDA approved facility in New Brunswick, NJ that was primarily designed to produce Alferon®. On September 16, 2009, our Board of Directors approved up to $4.4 million for full engineering studies, capital improvements, system upgrades and introduction of building management systems to enhance production of three products: Alferon N Injection®, Alferon® LDO and Ampligen®. As of December 31, 2010, construction in progress on this project was $485,000 as compared to $135,000 at December 31, 2009. We outsource certain components of our research and development, manufacturing, marketing and distribution while maintaining control over the entire process through our quality assurance group and our clinical monitoring group. Please see "Manufacturing" below for more information.

Our principal executive offices are located at One Penn Center, 1617 JFK Boulevard, Philadelphia, Pennsylvania 19103, and our telephone number is 215-988-0080.

AVAILABLE INFORMATION

We file our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 electronically with the Securities and Exchange Commission, or SEC. The public may read or copy any materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, NE, Washington, DC 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC. The address of that site is http://www.sec.gov.

You may obtain a free copy of our annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K and amendments to those reports on the day of filing with the SEC on our website on the World Wide Web at http://www.hemispherx.net or by contacting the Investor Relations Department by calling (518) 398-6222 or sending an e-mail message to ir@hemispherx.

OUR PRODUCTS

Our primary pharmaceutical product platform consists of our experimental compound, Ampligen®, our FDA approved natural interferon product, Alferon N Injection® and, our experimental liquid natural interferon for oral administration, Alferon® LDO (low dose oral).

Ampligen®

Ampligen® is an experimental drug currently undergoing clinical development for the treatment of Myalgic Encephalomyelitis/Chronic Fatigue Syndrome ("ME/CFS"). Over its developmental history, Ampligen® has received various designations, including Orphan Drug Product Designation (FDA), Treatment IND (e.g., treatment investigational new drugs, or "Emergency" or "Compassionate" use authorization) with Cost Recovery Authorization (FDA) and "promising" clinical outcome recognition based on the evaluation of certain summary clinical reports ("AHRQ" or Agency for Healthcare Research and Quality). Ampligen® represents the first drug in the class of large (macromolecular) RNA (nucleic acid) molecules to apply for New Drug Application ("NDA") review. Based on the results of published, peer reviewed pre-clinical studies and clinical trials, we believe that Ampligen® may have broad-spectrum anti-viral and anti-cancer properties. Over 1,000 patients have participated in the Ampligen® clinical trials representing the administration of more than 90,000 doses of this drug.

Nucleic acid compounds represent a potential new class of pharmaceutical products that are designed to act at the molecular level for treatment of human diseases. There are two forms of nucleic acids, DNA and RNA. DNA is a group of naturally occurring molecules found in chromosomes, the cell's genetic machinery. RNA is a group of naturally occurring informational molecules which orchestrate a cell's behavior which, in turn, regulates the action of groups of cells, including the cells which compromise the body's immune system. RNA directs the production of proteins and regulates certain cell activities including the activation of an otherwise dormant cellular defense against viruses and tumors. Our drug technology utilizes specifically-configured RNA. Our double-stranded RNA drug product, trademarked Ampligen®, is an experimental, unapproved drug, that would be administered intravenously. Ampligen® has been assigned the generic name rintatolimod by the United States Adopted Names Council (USAN) and has the chemical designation poly(I) poly(C12,U).

Clinical trials of Ampligen® already conducted by us include studies of the potential treatment of ME/CFS, Hepatitis B, HIV and cancer patients with renal cell carcinoma and malignant melanoma. All of these potential uses will require additional clinical trials to generate the safety and effectiveness data necessary to support regulatory approval.

On July 7, 2008, the FDA accepted for review our NDA for Ampligen® to treat CFS, originally submitted in October 2007. We are seeking marketing approval for the first-ever treatment for CFS. At present, only supportive, symptom-based care is available for CFS patients. The NDA for Ampligen® is also the first ever accepted for review by the FDA for systemic use of a toll-like receptor therapy to treat any condition. In November 2009, we received a Complete Response Letter ("CRL") from the FDA which described specific additional recommendations related to the Ampligen® NDA. In accordance with its 2008 Complete Response procedure, the FDA reviewers determined that they could not approve the application in its present form and provided specific recommendations to address the outstanding issues.

We have carefully reviewed the CRL and will seek a meeting with the FDA to discuss its recommendations upon the compilation of necessary data to be used in our response. We intend to take the appropriate steps to seek approval and commercialization of Ampligen®. Most notably, the FDA stated that the two primary clinical studies submitted with the NDA did not provide credible evidence of efficacy of Ampligen® and recommended at least one additional clinical study which shows convincing effect and confirms safety in the target population. The FDA indicated that the additional study should be of sufficient size and sufficient duration (six months) and include appropriate monitoring to rule out the generation of autoimmune disease. In addition, patients in the study should be on more than one dose regimen, including at least 300 patients on dose regimens intended for marketing. In designing and implementing these additional trials, we believe that it would be very valuable to first have the capability of utilizing a reliable diagnostic test to better identify potential participants. We are therefore pursuing efforts to identify and validate such a test (see "Progress In Search For CFS Test" below). In the Non-Clinical area, the FDA recommended among other things that we complete rodent carcinogenicity studies in two species. While as part of the NDA submission we had requested that these studies be waived, this waiver had not been granted by the FDA in their CRL.

Under the Product Quality section of the CRL, the FDA recommended that we submit additional data and complete various analytical procedures. The collection of these data and the completion of these procedures is already part of our ongoing Quality Control, Quality Assurance program for Ampligen® manufacturing under current Good Manufacturing Practice ("cGMP") guidelines and our manufacturing enhancement program. On January 14, 2010, we submitted reports of new preclinical data regarding Ampligen® to the FDA that we believe should be sufficient to address certain preclinical issues in the FDA's CRL. We do not anticipate receiving feedback until we submit our complete response to the CLR. The preclinical studies discussed in these reports were the combined work-product of the staffs at Hemispherx and Lovelace Respiratory Research Institute in Albuquerque, New Mexico, and included pharmacokinetic analyses in two lower animal species (primate and rodent). The new preclinical data showed no evidence of antibodies against Ampligen® in primates nor evidence of an increase in certain undesirable cytokines (specific modulators of the immune system) at clinically used doses of Ampligen® for CFS. Although most other

experimental immunomodulators have been associated with one or more features of aberrant immune activity, including toll-like receptor activators (of which Ampligen® is one), this was specifically not seen with Ampligen® in primates.

The FDA also commented on Ampligen® manufacturing noting the need to resolve outstanding inspection issues at the facilities producing Ampligen®. These include our New Brunswick facility and one of our third-party subcontractor manufacturing facilities, Hollister-Stier Laboratories of Spokane, Washington ("Hollister-Stier"). As discussed in "Manufacturing" below, we believe that these issues have been resolved.

We estimate that it could take approximately 18 months to three years to complete an Ampligen® clinical study for resubmission to the FDA under the industry norm of three to six months to initiate the study, one to two years to accrue and test patients, three to six months to close-out the study and file the necessary documents with the FDA. The actual duration to complete the clinical study may be different based on the final design of an accepted FDA clinical Phase III study, availability of participants, clinical sites, when the study commences and any other factors that could impact the implementation of the study, analysis of results, or requirements of the FDA and other governmental organizations.

Additionally, we estimate that the approximate cost to undertake the Ampligen® Phase III clinical study could range from $12,000 to $18,500 per each of the 600 participating patients, for an estimated range of total incremental costs of $7,200,000 to $11,100,000. Our estimate is based on the belief that our experience from the prior Phase III study and established teams (e.g., Medical, Data Processing, Clinical Monitors, Statisticians, Medical Reporting) along with existing inventory and investigational protocol, could produce financial efficiencies. We believe that these efficiencies could permit our costs of undertaking a Phase III CFS study to be discounted as compared to a potential $28,500 per patient cost approximated as an industry average for running a Phase III study from scratch, as estimated and adjusted for inflation, utilizing data from the business intelligence firm Cutting Edge Information. The actual costs of a Phase III investigation study for CFS may differ based on final design of an accepted FDA Phase III clinical study, prevailing costs to undertake clinical studies, qualification and access to CFS patients, insurance and government requirements along with other potential costs or reimbursements unknown at this time.

Aside from the foregoing, we cannot estimate what additional studies and/or additional testing or information that the FDA may require. Accordingly, as of this time, we are unable to estimate the nature, timing, costs and necessary efforts to obtain FDA clearance, the anticipated completion dates or whether we will obtain FDA clearance.

Notwithstanding the foregoing, we believe that it is important to find a reliable diagnostic test for CFS before committing greater resources to Phase III study (see "Progress In Search For CFS Test" below) since the identification of suitable participants is critical in the undertaking of a Phase III study. In addition, a reliable test would allow for an enhanced means to evaluate the effectiveness of Ampligen® on CFS.

In December 2010, the FDA granted us a one year extension to file a response to the CRL. While the Company remains committed to undertaking the Ampligen® Phase III clinical study, it is diligently working to address the diagnostic challenges related to CFS before commencing the requisite study.

Progress In Search For CFS Test

As stated on the CDC website, diagnosing CFS can be complicated by a number of factors:

1. There is no diagnostic laboratory test or biomarker for CFS;
2. Fatigue and other symptoms of CFS are common to many illnesses;
3. CFS is an invisible illness and many patients don't look sick;
4. The illness has a pattern of remission and relapse;
5. Symptoms vary from person to person in type, number and severity.

These factors have contributed to a very low diagnosis rate in which of the up to four million Americans estimated to have CFS, less than 20 percent of those stricken are being properly diagnosed. Because currently there is no FDA approved blood test, brain scan or other lab test to diagnose CFS, it's a diagnosis of exclusion. If a patient has had six or more consecutive months of severe fatigue that is reported to be unrelieved by sufficient bed rest and that is accompanied by nonspecific symptoms, including flu-like symptoms, generalized pain and memory problems, the patient may have CFS.

In the October 8, 2009 issue of Science Express, a consortium of researchers from the Whittemore Peterson Institute ("WPI"), the National Cancer Institute and the Cleveland Clinic reported a new retrovirus, xenotropic murine leukemia related virus ("XMRV") in the blood cells of 67% of CFS patients and 3.7% in healthy control subjects. The infectious virus was also greater than 99% identical to that previously detected in prostate cancer. Retrospective analyses of patient samples from the completed Phase III trial of Ampligen® in potential treatment of CFS continues in collaboration with WPI. While an updated agreement is being finalized with WPI, we continue to collaborate with WPI under the terms of an "Evaluation Agreement" that expired on July 23, 2010, to evaluate Hemispherx' patient samples for XMRV using WPI's flow cytometry assay. We believe that these studies may provide a new perspective on the design of an additional confirmatory Phase III study in this disorder.

In addition, on March 2, 2011, we jointly filed a provisional United States patent application on a blood test for CFS with Chronix Biomedical ("Chronix"). This experimental approach analyzes fragments of DNA often released into the bloodstream during the process of apoptosis or programmed cell death to measure alterations in specific regions of the chromosome, which can be detected as distinctive "signatures" in cell-free blood-borne DNA. The patient-unique signatures captured by Chronix' technology may prove useful as a companion diagnostic and to provide information about the disease process to help pharmaceutical companies select the most efficacious drug candidates. The use of this diagnostic technology for CFS diagnosis will be evaluated in a study being planned by Chronix and Hemispherx.

Alferon N Injection®

Alferon N Injection® is the registered trademark for our injectable formulation of natural alpha interferon, which is approved by the FDA in 1989 for the treatment of certain categories of genital warts. Alferon® is the only natural-source, multi-species alpha interferon currently approved for sale in the U.S. for the intralesional (within lesions) treatment of refractory (resistant to other treatment) or recurring external genital warts in patients 18 years of age or older.

Interferons are a group of proteins produced and secreted by cells to combat diseases. Researchers have identified four major classes of human interferon: alpha, beta, gamma and omega. Alferon N Injection® contains a multi-species form of alpha interferon. The worldwide market for injectable alpha interferon-based products has experienced rapid growth and various alpha interferon injectable products are approved for many major medical uses worldwide. Alpha interferons are manufactured commercially in three ways: by genetic engineering, by cell culture, and from human white blood cells. All three of these types of alpha interferon are or were approved for commercial sale in the U.S. Our natural alpha interferon is produced from human white blood cells.

The potential advantages of natural alpha interferon over recombinant (synthetic) interferon produced and marketed by other pharmaceutical firms may be based upon their respective molecular compositions. Natural alpha interferon is composed of a family of proteins containing many molecular species of interferon. In contrast, commercial recombinant alpha interferon products each contain only a single species. Researchers have reported that the various species of interferons may have differing antiviral activity depending upon the type of virus. Natural alpha interferon presents a broad complement of species, which we believe may account for its higher activity in laboratory studies. Natural alpha interferon is also glycosylated (partially covered with sugar molecules). Such glycosylation is not present on the currently U.S. marketed recombinant alpha interferons. We believe that the absence of glycosylation may be, in part, responsible for the production of interferon-neutralizing antibodies seen in patients treated with recombinant alpha interferon. Although cell culture-derived interferon is also composed of multiple glycosylated alpha interferon species, the types and relative quantity of these species are different from our natural alpha interferon.

Alferon N Injection® [Interferon alfa-n3 (human leukocyte derived)] is a highly purified, natural-source, glycosylated, multi-species alpha interferon product. There are essentially no antibodies observed against natural interferon to date and the product has a relatively low side-effect profile.

The recombinant DNA derived alpha interferon formulations have been reported to have decreased effectiveness after one year, probably due to antibody formation and other severe toxicities. These detrimental effects have not been reported with the use of Alferon N Injection®.

The FDA approved Alferon N Injection® in 1989 for the intralesional (within lesions) treatment of refractory (resistant to other treatment) or recurring external genital warts in patients 18 years of age or older. Certain types of human papilloma viruses (“HPV”) cause genital warts, a sexually transmitted disease (“STD”). The Centers for Disease Control and Prevention (“CDC”) estimates that approximately twenty million Americans are currently infected with HPV with another six million becoming newly infected each year. The CDC states that HPV is so common, that at least 50% of sexually active men and women get it at some point in their lives.

Commercial sales of Alferon N Injection® were halted in March 2008 when our finished goods inventory expired. We are in the process of upgrading our manufacturing capability for Alferon N Injection® at our New Brunswick facility. As a result, we expect to be in a position to resume manufacture of Alferon N Injection® [Please see “Alferon® Low Dose Oral (LDO)” and “Manufacturing” below for more information].

Alferon® Low Dose Oral (LDO)

Alferon® LDO [Low Dose Oral Interferon Alfa-n3 (Human Leukocyte Derived)] is an experimental low-dose, oral liquid formulation of Natural Alpha Interferon and like Alferon N Injection® should not cause antibody formation, which is a problem with recombinant interferon. It is an experimental immunotherapeutic believed to work by stimulating an immune cascade response in the cells of the mouth and throat, enabling it to bolster systemic immune response through the entire body by absorption through the oral mucosa. Oral interferon could be economically feasible for patients and logistically manageable in development programs in third-world countries primarily affected

by influenza and other emerging viruses. Oral administration of Alferon® LDO, with its anticipated affordability, low toxicity, no production of antibodies, and broad range of potential bioactivity, could be a breakthrough treatment or prevention for viral diseases.

In October 2009, we submitted a protocol to the FDA proposing to conduct a Phase II, double-blind, adaptive-design, randomized, placebo-controlled, dose-ranging study of Alferon® LDO for the prophylaxis and treatment of seasonal and pandemic influenza of more than 200 subjects. Following a teleconference with the FDA in November 2009, the FDA placed the proposed study on "Clinical Hold" because the protocol was deemed by the FDA to be deficient in design, and because of the need for additional information to be submitted in the area of chemistry, manufacturing and controls ("CMC"). Thereafter in December 2009, we submitted additional information by an Amendment with respect to both the clinical protocol design issues and the CMC items. In January 2010, the FDA acknowledged that our responses to the clinical study design issues were acceptable; however, removal of the Clinical Hold was not warranted because the FDA believed that certain CMC issues had not been satisfactorily resolved. In this regard, the FDA communicated concern regarding the extended storage of Alferon® LDO drug product clinical lots which had been manufactured from an active pharmaceutical ingredient ("API") of Alferon N Injection® manufactured in year 2001. While the biological (antiviral) potency of the product had remained intact, we learned through newly conducted physico-chemical tests (the "new tests" of temperature, pH, oxidation and light on the chemical stability of the active API), that certain changes in the drug over approximately nine storage years (combined storage of Alferon N Injection® plus storage of certain LDO sachets) had introduced changes in the drug which might adversely influence the human safety profile. These "new tests" are part of recent FDA requirements for biological products, such as interferon, which did not exist at the time of the original FDA approval of Alferon N Injection® for commercialization and at the time of FDA approval of the "Product License" and "Establishment License" for the Alferon N Injection® product. Based on the recent FDA request, we have now established and implemented the "new test" procedures. As a result, we have found that certain Alferon N Injection® lots with extended storage (i.e., approximately eight to nine years) do appear to demonstrate some altered physico-chemical properties. However we have also observed that more recent lots, including those manufactured beginning in the year 2006, are superior with respect to the enhanced scrutiny of these tests and, in our view, could be considered appropriate for clinical trials in the Alferon® LDO sachet format. Upon their review, the FDA has been responsive to these new findings and requested additional stability data on the lots proposed for use in this clinical study utilizing the new test methods. The proposed clinical lots were manufactured on June 24, 2010 and placed on stability on June 28, 2010. The FDA had requested three months of stability data on the proposed clinical lots which was compiled, analyzed and submitted to the FDA on November 12, 2010. On December 22, 2010, the FDA informed us that the Agency had completed its review of our complete response to the Clinical Hold and lifted the Clinical Hold, allowing our Phase II Study to proceed.

HISTORICAL COSTS RELATED TO OUR PRODUCTS

The following table sets forth the costs related to our major products for each of the prior three years. Our aggregate expenses from the time that we first started developing nucleic acid pharmaceutical technology in the mid 1980's through March 2003 were substantially related to the development of Ampligen®, and from that date through the current period were substantially related to Ampligen® and Alferon.

Costs and Expenses	(dollars in thousands) Year Ended December 31, 2010				
	Ampligen® NDA	Alferon N Injection®	Alferon® LDO	Other	Total
Production/cost of goods sold	$-	$1,341	$-	$-	$1,341
Research and development	2,787	-	4,658	168	7,613
General and administrative	2,356	1,133	3,937	142	7,568
Total	$5,143	$2,474	$8,595	$310	$16,522

Costs and Expenses	(dollars in thousands) Year Ended December 31, 2009				
	Ampligen® NDA	Alferon N Injection®	Alferon® LDO	Other	Total
Production/cost of goods sold	$-	$584	$-	$-	$584
Research and development	5,026	-	1,784	185	6,995
General and administrative	3,844	447	1,364	141	5,796
Total	$8,870	$1,031	$3,148	$326	$13,375

Costs and Expenses	(dollars in thousands) Year Ended December 31, 2008				
	Ampligen® NDA	Alferon N Injection®	Alferon® LDO	Other	Total
Production/cost of goods sold	$-	$798	$-	$-	$798
Research and development	5,491	-	-	309	5,800
General and administrative	5,392	783	-	303	6,478
Total	$10,883	$1,581	$-	$612	$13,076

PATENTS AND NON-PATENT EXCLUSIVITY RIGHTS

At March 1, 2011, we had 20 patents worldwide with 78 additional pending patent applications pending comprising our intellectual property. In 2006, we obtained the global patent rights for a compound that enhances DNA vaccination by the efficient intracellular delivery of immunogenic DNA (i.e., DNA that can produce antigenic proteins that simulate an acute viral infection with a resultant humoral and cell-mediated immune response). Please see "Note

5: Patents, Trademark Rights and Other Intangibles" under Notes To Consolidated Financial Statements for more information on these patents.

We continually review our patents' rights to determine whether they have continuing value. Such review includes an analysis of the patent's ultimate revenue and profitability potential. In addition, Management's review addresses whether each patent continues to fit into our strategic business plans for Ampligen®, Alferon N Injection® and Alferon® LDO.

With respect to Ampligen®, the main U.S. ME/CFS treatment patent (#6130206) expires October 10, 2017. Our main patents covering HIV treatment (#4820696, #5063209, and #5091374) expired on April 11, 2006, November 5, 2008, and February 25, 2009, respectively; Hepatitis treatment coverage is conveyed by U.S. patent #5593973 which expires on January 14, 2014. Our U.S. Ampligen® Trademark (#73/617,687) has been renewed through December 6, 2018.

In addition to our patent rights relating to Ampligen®, the FDA has granted "orphan drug status" to the drug for ME/CFS, HIV/AIDS, and renal cell carcinoma and malignant melanoma. Orphan drug status grants us protection against the potential approval of other sponsors' versions of the drug for these uses for a period of seven years following FDA approval of Ampligen® for each of these designated uses. The first NDA approval for Ampligen® as a new chemical entity will also qualify for four or five years of non-patent exclusivity during which abbreviated new drug applications seeking approval to market generic versions of the drug cannot be submitted to the FDA. (See "Government Regulation" below.)

The U.S. patents relating to our Alferon® products expire April 2, 2013 (5,503,828) October 14, 2014 (5,676,942) and December 22, 2017 (5,989,441).

Oragens®

In 1999, we acquired a series of patents on Oragens®, potentially a set of oral broad spectrum antivirals and immunological enhancers, through a licensing agreement with Temple University ("Temple") in Philadelphia, PA. For a $30,000 annual minimum royalty payment and costs to maintain the patents, we were granted an exclusive worldwide license from Temple for the Oragens® products. These compounds had been evaluated in various academic laboratories for application to chronic viral and immunological disorders.

In the 2009 review of our patent rights to determine whether they have continuing value, we undertook an analysis of the Oragen® patents prior to renewing the licensing agreement with Temple. This review included a cost/benefit analysis of the patents' ultimate revenue and profitability potential in consideration of their remaining life. In addition, management studied the rights as to whether each patent continues to fit into our strategic business plans for Ampligen®, Alferon N Injection® and Alferon® LDO. As a result of this process, we proposed a patent renewal agreement that significantly discounted the prior agreement's annual minimum royalty payment. In February 2010, it was formally communicated by Temple that they had elected not to pursue our proposal to renew the series of patents on Oragens®. Accordingly as of December 2009, we wrote-off the remaining value of these patents from Patent and Trademark Rights resulting in a net expense for Patents Abandoned of $114,000.

RESEARCH AND DEVELOPMENT ("R&D")

Our general focus is on developing drugs for use in treating viral and immune based chronic disorders and diseases such as ME/CFS, HIV, HPV and West Nile Virus, Cancer and Influenza. Our current R&D projects are only targeting treatment therapies for ME/CFS and other viral diseases such as prevention and treatment of seasonal and pandemic H1N1 or influenza.

Our primary focus during the past three fiscal years has been on our Ampligen® New Drug Application for the treatment of CFS. In 2009, we also began to develop Alferon® Low Dose Oral for treatment of viral diseases including influenza.

The following table summarizes our research and development costs for the years 2008, 2009 and 2010 by project:

	(in thousands)		
	2008	2009	2010
Ampligen® New Drug Application for the treatment of Chronic Fatigue Syndrome	$ 5,491	$ 5,026	$ 2,787
Alferon® LDO for influenza	-	1,784	4,658
Alferon N Injection® for influenza	-	-	168
Other projects	309	185	-
Total research and development	$ 5,800	$ 6,995	$ 7,613

On December 22, 2010, the FDA lifted a clinical hold on our Phase II Study for Alferon® LDO, which is the initial stages of development. See “Our Products” above. Due to the inherent uncertainty involved in the design and conduct of clinical trials and the applicable regulatory requirements, including the factors discussed above in “Our Products; Ampligen®”, we cannot predict what additional studies and/or additional testing or information may be required by the FDA. Accordingly, we are unable to estimate the nature, timing, costs and necessary efforts to complete these projects nor the anticipated completion dates. In addition, we have no basis for estimating when material net cash inflows may commence. We have yet to generate any revenues from the sale of these developmental products. As of December 31, 2010, we had approximately $44.4 million in Cash, Cash Equivalents and Marketable Securities. Based upon our current anticipated financial needs, absent unexpected circumstances or new opportunities, we anticipate, but cannot assure, that we will be able to fund operations for at least the next four years. However, if we are unable to timely commercialize and sell Ampligen® for the treatment of CFS or Alferon® LDO and/or recommence material sales of Alferon N Injection®, our operations, financial position and liquidity will be adversely affected (see Item 1A. Risk Factors; “We may require additional financing which may not be available” below).

Myalgic Encephalomyelitis/Chronic Fatigue Syndrome ("ME/CFS")

Chronic Fatigue Syndrome (“CFS”), also known as Chronic Immune Dysfunction Syndrome (“CFIDS”) and, Myalgic Encephalomyelitis (“ME”) is a serious and debilitating chronic illness and a major public health problem. ME/CFS is recognized by both the government and private sector as a major health problem, including the National Institutes of Health, FDA and the U.S. Centers for Disease Control and Prevention (“CDC”). The CDC listed ME/CFS as a priority disease, causing severe health and financial problems for patients, their family, and the community. ME/CFS is endemic in the population, but occasionally seen in clusters suggesting an infectious basis. A variety of immunological, endocrine, autonomic nervous system, and metabolic abnormalities have been documented.

Dr. Julie Gerberding, former director of the CDC and current president of Merck & Company’s vaccine division, has stated that "The CDC considers Chronic Fatigue Syndrome to be a significant public health concern and we are committed to research that will lead to earlier diagnosis and better treatment of the illness." A variety of studies by the CDC and others have shown that between 1 and 4 million Americans suffer from CFS. While those with the disease are seriously impaired and at least a quarter are unemployed or on disability because of CFS, only about half have consulted a physician for their illness. Equally important, about 40% of people in the general population who report symptoms of ME/CFS have a serious, treatable, previously unrecognized medical or psychiatric condition (such as diabetes, thyroid disease, substance abuse). ME/CFS is a serious illness and poses a dilemma for patients, their families and health care providers.

The CDC has launched a national public education and awareness campaign in which CFS is described as a debilitating and complex disorder characterized by profound fatigue that is not improved by bed rest and that may be worsened by physical or mental activity. Persons with CFS most often function at a substantially lower level of activity than they were capable of before the onset of illness. The campaign provides information regarding the diagnosis and treatment of CFS, and is designed to raise awareness of the disease among patients and clinicians. A CDC sponsored website at www.cdc.gov/cfs provides easy to understand, downloadable educational sources for patients, their families and health care professionals including a "CFS Toolkit" that offers a quick and easy-to-use resource for patients and healthcare providers regarding best practices for diagnosing, treating, and managing CFS.

While ME/CFS strikes people of all age, racial, ethnic, and socioeconomic groups, it is most prevalent amongst women. Research has shown that ME/CFS is about three times as common in women as men, a rate similar to that of many autoimmune diseases, such as multiple sclerosis and lupus. To put this into perspective, ME/CFS is over four times more common than HIV infection in women, and the rate of ME/CFS in women is considerably higher than a woman's lifetime risk of getting lung cancer as published by the CFIDS Association of America.

Many severe ME/CFS patients become completely disabled or totally bedridden and are afflicted with severe pain and mental confusion even at rest. ME/CFS is characterized by incapacitating fatigue with profound exhaustion and extremely poor stamina, sleep difficulties and problems with concentration and short-term memory. It is also accompanied by flu-like symptoms, pain in the joints and muscles, tender lymph nodes, sore throat and new headaches. A distinctive characteristic of the illness is a worsening of symptoms following physical or mental exertion which do not subside with rest.

The case definition for ME/CFS criteria calls for certain symptoms to be present along with fatigue that interferes with physical, mental, social and educational activities. Both the fatigue and symptoms must have occurred for (at least) a six month period. People with ME/CFS may experience many more than the symptoms named in the case definition, so knowledgeable physicians will take this fact into consideration when making a diagnosis (after other possible reasons for symptoms have been ruled out).

Most ME/CFS patients are treated symptomatically with traditional treatments geared toward treating symptoms of the disease, such as improving quality of sleep, reducing pain and treatment of depression. Clinically, a number of different therapeutic approaches have been pursued, but with no significant clinical success.

Because no cause for ME/CFS has been identified, current treatment programs are directed at relieving symptoms, with the goal of the patient regaining some level of function and well-being. Diagnosis of ME/CFS is a time-consuming and challenging process for which there is no FDA approved diagnostic test or biomarker to clearly identify the disorder. Diagnosis is primarily arrived at by taking a patient's medical history, completing a physical exam and lab tests to rule out other conditions excluding other illnesses with similar symptoms and comparing a patient's symptoms with the case definition. Overlapping symptoms can occur with several diseases, such as fibromyalgia, Gulf War Illnesses, chronic Lyme disease and multiple chemical sensitivities. Many diseases have similar symptoms including Lupus and Lyme disease which may closely mimic ME/CFS that they need to be considered when making a diagnosis to rule them out. If there are no abnormal test results or other physical ailments identified, clinicians can use standardized tests to quantify the level of fatigue and evaluate symptoms. Diagnosis can be complicated by the fact that the symptoms and severity of CFS vary considerably from patient to patient. New diagnostic approaches to possibly accelerate the identification of ME/CFS are being developed (see "Our Products; Ampligen®; Progress In Search For CFS Test" above concerning experimental approaches to possible CFS diagnostic tests).

Other Viral Diseases

We are engaged in ongoing, experimental studies assessing the efficacy of Ampligen®, Alferon N Injection® and Alferon® LDO against influenza viruses.

A Phase II Trial for intramuscular administration of Ampligen® for seasonal influenza was conducted in Australia through St. Vincent's Hospital with the final patient completing the study in September 2008. This open-label study (Phase IIa Trial) utilized Ampligen® as a potential immune-enhancer in Australia with thirty-eight subjects age 60 or greater with the standard trivalent seasonal influenza vaccines. We continue in good faith to work towards obtaining the clinical data and retrieve the study samples from St. Vincent's recently restructured Clinical Trials Centre and related Clinical Network Services. As a prerequisite of payment, we had requested the confirmation that samples were properly maintained utilizing cGCP and Good Laboratory Practice ("cGLP") for the controlled environment as per our agreement. On February 5, 2010, our Counsel advised representatives of St. Vincent's business units in correspondence that, due to the failure to meet the condition precedent to payment, we had no choice but to declare them in breach of the study agreement and that it was our intention to terminate the relationship between the parties. Since February 18, 2010, various offers and counteroffers have been made between us and Clinical Trials Centre and Clinical Network Services, to permit us to retrieve the data by making certain payments to each organization with funds equal to the disputed amount placed in escrow. We would then be granted access to review the data during a two day visit to their sites in Australia. Following our satisfaction that the clinical study was conducted utilizing cGCP along with samples properly maintained utilizing cGLP, the escrow funds would be released to Clinical Trials Centre and Clinical Network Services so that pathology samples could be collected by us. The proposals for data collection and the dollar value of the disputed fees are currently being reviewed by the respective parties.

Ampligen® as a mucosal adjuvant with vaccine has been studied at Japan's National Institute of Infectious Disease ("NIID") and at Biken (the for profit operational arm of the Foundation for Microbial Diseases of Osaka University). Investigators from Japan's NIID have conducted studies in animals that suggest that Ampligen® can stimulate a sufficiently broad immune response to provide cross-protection against a range of virus genetic types, including H5N1 and derivative clades. Japan's Council for Science & Technology Policy ("CSTP"), a cabinet level position, awarded funds from Japan's CSTP to advance research with influenza vaccines utilizing Ampligen. The Principal Investigator, Dr. Hideki Hasegawa, M.D., Ph.D., Chief of Laboratory of Mucosal Vaccine Development Virus Research Center, undertook studies in 2009 and continued in 2010 that focus on mucosal immunity and the inherent advantages of a vigorous immune response to respiratory pathogens. Dr. Hasegawa has published data that the formulation of pandemic vaccine mixed with Ampligen® increases immuno-genicity and may demonstrate cross protection against mutated strains.

Initial data from findings in mice exposed to the most virulent forms of pandemic influenza (H5N1) suggest that standard human seasonal influenza vaccines given alone, and having no benefit on H5N1 influenza virus pathology and clinical status, were nonetheless effective against pandemic virus when combined with Ampligen® when applied intranasally in very small doses in a prophylactic treatment setting. In July 2010, we released a report prepared by Dr. Hasegawa summarizing the results of the three year Japanese government funded program through the Japanese Minister of Health Labor and Welfare ("MHLW") to develop and test on non-human primates a nasally delivered H5N1 (Avian Flu) vaccine which, when coupled with Ampligen®, produced positive results in a preclinical testing environment showing that the combination provided a more robust and longer lasting immune response as compared to the vaccine used alone. The researchers concluded that their results could be applied to develop intranasally delivered vaccines for influenza virus prophylaxis focused on protection of the mucosal immune system against virus mutations. We had expected that the clinical testing phase of Ampligen®, used in conjunction with a H5N1 (Avian Flu) vaccine, in Japan would begin in 2011. However, the occurrence and timing of clinical testing is dependent upon the successful conclusion of our negotiations with Biken along with their timely filing and approval of an Investigatory New Drug ("IND") application for Ampligen® in Japan. A Material Evaluation Agreement ("MEA") regarding Ampligen® with Biken that was initiated on August 19, 2009, effectively expired on September 1, 2010. Pursuant to the agreement, we supplied Biken with proprietary information related to Ampligen® and Biken purchased Ampligen® from us for use solely in connection with evaluating Ampligen® as a candidate for adjuvant incorporated into potential influenza virus vaccines in the form of intranasal mucosal administration, including conducting further animal studies of intranasal prototype vaccines containing antigens from various influenza sub-types, including H5N1, H1N1, H3N2 and B. Hemispherx and Biken are in correspondence concerning both the possibility of extending or replacing the expired agreement and reconciling the interpretation of experimental results. However until such time that a new agreement can be established, no collaboration is being undertaken between the respective companies.

In April 2010, we began the process to undertake a clinical study with Max Neeman International, a leading and large clinical research organization in India. This collaborative clinical research effort is intended to utilize Alferon N Injection® for treatment of seriously ill patients hospitalized with either seasonal influenza or pandemic influenza. The Indian site selection process was initiated and we obtained approval to begin the study from the Indian Drugs Controller General on July 13, 2010. We began enrolling subjects in September 2010 and will continue to enroll subjects through the winter's flu season and the spring's rainy season. As of March 1, 2011, we have five operational Clinical Investigative Sites, with the potential to add additional sites. Our Study has progressed at a rate slower than originally projected with difficulties encountered in the process of screening for subjects who were strickened only with influenza. In an attempt to expedite the process to qualify study subjects, we have added a second "point of care" screening test which we believe will broaden our range of detection for of influenza viruses. Our objective is to qualify and enroll sixty patients for the study.

Collaboration studies in non-human primates conducted by ViroClinics in the Netherlands suggested a potential role for Alferon® LDO as another novel therapeutic approach to viral pandemics. In these studies, Alferon® LDO treatment appeared to be more effective than published results for a neuraminidase inhibitor (Relenza®), which is a current standard for care of seasonal influenza along with a similar drug (Tamiflu®). In October 2009, we submitted a protocol to the FDA proposing to conduct a Phase II, well-controlled, clinical study using Alferon® LDO for the prophylaxis and treatment of seasonal and pandemic influenza of more than 200 subjects.

MANUFACTURING

We own and operate a 43,000 sq. ft. FDA approved facility in New Brunswick, NJ that was originally designed to produce Alferon N Injection®. On September 16, 2009, our Board of Directors approved up to $4.4 million for engineering studies, capital improvements, system upgrades and building management systems. Construction in progress on this project was $485,000 and $135,000 at December 31, 2010 and 2009, respectively. The major capital

improvement program is to enhance our manufacturing capability for Alferon N Injection® along with the possibility to produce Alferon® LDO and Ampligen®. The planned capital improvements include an upgrade to the air handling system, building new changing rooms and the purchase of necessary equipment to manufacture Alferon N Injection®. As a result of these manufacturing enhancements, provided we can either promptly renew our prior agreement with a third-party vendor or find another vendor that can provide the needed cGMP formulation, packaging and labeling services, we expect to be able to complete the manufacture of Alferon N Injection® for potential commercial sales by mid to late 2011.

The New Jersey District Office of the FDA conducted an inspection of the New Brunswick, New Jersey facility in late January and early February 2009 in connection with review of the Ampligen® NDA. A one-page Form FDA 483 was issued citing a need to re-perform four method validations to generate data in the New Brunswick Laboratories. These validations had been performed at another site also owned and operated by us prior to transferring the equipment to New Brunswick. The validations have been completed and the reports were forward to the FDA in April 2009 for review. As a result, the New Jersey office of the FDA has indicated that there are no more preapproval review issues at that time. In addition to having addressed all known FDA Form 483 issues, we reported to the regional office of the FDA that the New Brunswick facility is in progress of validating certain manufacturing steps and compiling data that will be sent to the FDA after NDA approval or as required.

The FDA, in its November 25, 2009 CRL, noted that its field investigators had conveyed deficiencies to us at our New Jersey facility that needed to be resolved before the NDA could be approved. We believe these issues to be the same as those on the Form FDA 483 discussed above. At our expected meeting with the FDA to review the CRL, we intend to communicate that it is our understanding that these manufacturing issues have been addressed. The FDA also described specific recommendations related to the Ampligen® NDA in the "Product Quality" section of the CRL which identified additional analytic procedures to be submitted to the FDA. We believe that these procedures are already part of our ongoing Quality Control, Quality Assurance program for Ampligen® manufacturing under cGMP requirements. We continue to plan to complete the remaining tests needed to address the issues identified in the CRL as part of our originally scheduled post-approval testing prior to any commercial sales of Ampligen®.

We outsource certain components of our research and development, manufacturing, marketing and distribution while maintaining control over the entire process through our Quality Assurance Group and our Clinical Monitoring Group. We had a Supply Agreement through March 1, 2011 with Hollister-Stier Laboratories LLC of Spokane, Washington ("Hollister-Stier"), pursuant to which Hollister-Stier would formulate and package Ampligen® from the key raw materials that we would supply to Hollister-Stier. We currently are negotiating with Hollister-Stier to renew the agreement for two years under terms similar to those in the expired Supply Agreement. Pursuant to the expired agreement, at least 90 days prior to our first order, we would be required to provide a written 12 month rolling forecast of our initial requirements for the product and, every 90 days thereafter, provide an extended 12 month forecast of the number of batches we anticipate will be needed and the requested delivery dates. Our baseline cost would be set in the agreement and increases annually based on any percentage increase in the Producer Price Index - Pharmaceutical Preparations. Payment would be due 30 days after our acceptance of the Product. Hollister-Stier would have the right of first refusal to manufacture certain Ampligen® related products. The agreement was terminable by either party upon a material breach by the other party of the agreement that is not cured within 60 days or upon the other party's insolvency or certain filings under the U.S. Bankruptcy Code. If we are unable to renew our agreement with Hollister-Stier on acceptable terms, we will need to find another vendor.

The FDA, in its CRL, also noted the need to resolve outstanding inspection issues at the Hollister-Stier facility. On December 11, 2009 via Hollister-Stier, we submitted comprehensive new data to the District Office ("DO") of the FDA in Seattle, WA, which we believed demonstrated that certain manufacturing issues noted in the pre-approval inspections at the facility had been fully addressed. On February 2, 2010, Hollister-Stier received a favorable response from the FDA's Seattle DO in which they noted that certain manufacturing issues noted in the pre-approval inspection at this facility had been fully addressed and that they had forwarded a recommendation to the FDA's CDER for approval of Hollister-Stier as a manufacturing site under the Ampligen® NDA. The DO recommendations are not binding on the FDA and pertain only to the specific manufacturing issues cited in the Ampligen® manufacturing response and to the subcontractor site.

The production of Alferon N Injection® from our existing Work-In-Progress Inventory, which has an approximate expiration date of 2012, had remained on hold for conversion due to the dedication of resources to prepare the New Brunswick facility for the FDA preapproval inspection with respect to Ampligen® NDA. Since adequate financial resources were obtained to commence upgrades to the Ampligen® and Alferon® manufacturing process, the conversion of existing Alferon N Injection® Work-In-Progress inventory was started up in May 2010 towards the manufacture of new Finished Goods. Provided we can either promptly renew our prior agreement with a third-party vendor or find another vendor that can provide the needed cGMP formulation, packaging and labeling services, we expect to be able to complete the manufacture of Alferon N Injection® for potential commercial sales by mid to late 2011.

We have manufactured purified drug concentrate utilized in the formulation of Alferon N Injection® in our New Brunswick, New Jersey facility. With the initial manufacturing stages of new Alferon® Work-In-Progress underway, we are seeking new vendors that can provide the needed cGMP formulation, packaging and labeling services for this product. It is our intension to utilize this new Alferon® Work-In Progress Inventory for clinical studies and commercial sales.

MARKETING/DISTRIBUTION

Our marketing strategy for Ampligen® reflects the differing health care systems around the world along with the different marketing and distribution systems that are used to supply pharmaceutical products to those systems. In the U.S., we expect that, subject to receipt of regulatory approval, Ampligen® may be utilized in four medical arenas: physicians' offices; clinics; hospitals; and the home treatment setting. We remain in the process of developing pre-launch and launch driven marketing plans focusing on those audience development, medical support and payor reimbursement initiatives which will facilitate product acceptance and utilization at the time of regulatory approval. Similarly, we continue to develop distribution scenarios for the Specialty Pharmacy/Infusion channel which will insure market access, offer 3PL (third party logistics) capabilities and provide the requisite risk management control mechanisms. It is our intent to utilize third party service providers to execute elements of both the marketing/sales and distribution plans. We currently plan to utilize a small group of Managed Market account managers to introduce the product to payor, employer and government account audiences. We believe that this approach will establish a market presence and facilitate the generation of revenue without incurring the substantial costs associated with a traditional sales force. Furthermore, Management believes that the approach will enable us to retain many options for future marketing strategies.

For example, our commercialization strategy for Ampligen®-CFS may include licensing/co-marketing agreements utilizing the resources and capacities of a strategic partner(s). We are seeking world-wide marketing partner(s), with the goal of having a relationship in place before approval is obtained. In parallel to partnering discussions, appropriate pre-marketing activities will be undertaken. We intend to control manufacturing of Ampligen on a world-wide basis.

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On July 15, 2010, we entered into an amended adviser's agreement (the "Sage Agreement") with The Sage Group, Inc. ("Sage") that amends and supersedes all other agreements and arrangements between the parties. Sage was instrumental in securing our relationship with Biken. Pursuant to the Sage Agreement, we have retained Sage to assist us in finding and consummating licensing, partnering, distribution, alliance or other similar transactions pertaining to and promoting the sale of our products and technologies ("Transactions"). Transactions do not include agreements that are non-revenue producing such as research arrangements or feasibility studies. The Sage Agreement runs for 18 months and automatically renews for an additional 18 months unless terminated on 180 days notice prior to the expiration of the term. For its services, Sage is entitled to a monthly fee of $15,000. Should we enter into a Transaction during the term of the Sage Agreement or within 18 months thereafter, Sage is entitled to a success fee equal to five percent of all Consideration (as defined in the Sage Agreement) received by us and our affiliates as a result of the Transaction. The Success Fee is capped at $5,000,000 per year. At the sole discretion of our Board, Sage may receive an additional bonus for extraordinary performance or special projects up to $250,000 per year. Upon execution of the Sage Agreement, we issued an aggregate of 545,000 10 year options to Sage personnel.

In January 2010, we engaged an Argentinean regulatory and business design entity to explore the possibility of initiating clinical trials of Alferon N Injection®, Ampligen® and Alferon® LDO during the influenza season in Argentina. On June 14, 2010, we executed an exclusive Sales, Marketing, Distribution and Supply Agreement for Argentina with GP Pharm Latinoamerica (“GP Pharm”), an affiliate company of Spanish GP Pharm SA. Under this Agreement, GP Pharm will be responsible for gaining regulatory approval in Argentina for Ampligen® to treat CFS in Argentina and for commercializing Ampligen® for this indication in Argentina. We granted GP Pharm the right to expand rights to sell this experimental therapeutic into other Latin America countries based upon GP Pharm achieving certain performance milestones. We also granted GP Pharm an option to market Alferon N Injection®, in Argentina and other Latin America countries as well. Under this Agreement, we will manufacture and supply Ampligen® to GP Pharm. On November 15, 2010, we amended our June 15, 2010 agreement with GP Pharm to include Mexico in the Territory under the Sales, Marketing, Distribution and Supply Agreement. Under this Agreement, GP Pharm Mexico will be responsible for gaining regulatory approval in Mexico for Ampligen®, an experimental therapeutic, to treat CFS in Mexico and for commercializing Ampligen® for this indication in Mexico. The Company has granted GP Pharm the right to expand rights to sell this experimental therapeutic into other Latin America countries based upon GP Pharm achieving certain performance milestones.

COMPETITION

RNA based products and toll-like receptors (“TLRs”) have demonstrated great promise in preclinical and limited clinical applications resulting in active research and development by large pharmaceutical companies and emerging Biotech firms. As such, our potential competitors are among the largest pharmaceutical companies in the world, are well known to the public and the medical community, and have substantially greater financial resources, product development, and manufacturing and marketing capabilities than we have.

These companies and their competing products may be more effective and less costly than our products. In addition, conventional drug therapy, surgery and other more familiar treatments will offer competition to our products. Furthermore, our competitors have significantly greater experience than we do in pre-clinical testing and human clinical trials of pharmaceutical products and in obtaining FDA (in the US), Agency for the Evaluation of Medicinal Products (“EMEA”) (in Europe) and Health Protection Branch ("HPB") (in Canada), and other regulatory approvals of products. Accordingly, our competitors may succeed in obtaining FDA, EMEA and HPB product approvals more rapidly than us. If any of our products receive regulatory approvals and we commence commercial sales of our products, we will also be competing with respect to manufacturing efficiency and marketing capabilities, areas in which we have no experience. Our competitors may possess or obtain patent protection or other intellectual property rights that prevent, limit or otherwise adversely affect our ability to develop or exploit our products.

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The major pharmaceutical competitors with biotech capabilities/vaccine franchises include Pfizer, GSK, Wyeth (now part of Pfizer), Merck, Novartis, Gilead Pharmaceutical, and Schering-Plough Corp (now part of Merck). Biotech competitors include Baxter, Fletcher/CSI, AVANT Immunotherapeutics, AVI Biopharma and GENTA. When we recommence sales of Alferon N Injection®, it will again compete with products produced by Schering-Plough Corp. and others for treating genital warts. 3M Pharmaceutical also markets its immune response modifier product, Aldera®, for the treatment of genital and perianal warts. We believe the approval and marketing of this product is the main reason that past sales of Alferon N Injection® have not met our expectations since acquisition. In November 2006, the botanical drug, Veregen® (marketed by Bradley Pharmaceuticals) was also approved for the topical treatment of genital and perianal warts. In addition, because certain competitive products are not dependent on a source of human blood cells, such products may be able to be produced in greater volume and at a lower cost than Alferon N Injection®. Our wholesale price on a per unit basis of Alferon N Injection® is higher than that of the competitive recombinant alpha and beta interferon products.

GOVERNMENT REGULATION

Regulation by governmental authorities in the U.S. and foreign countries is and will be a significant factor in the manufacture and marketing of Alferon® N products and our ongoing research and product development activities. Ampligen® and other products developed from the ongoing research and product development activities will require regulatory clearances prior to commercialization. In particular, new drug products for humans are subject to rigorous preclinical and clinical testing as a condition for clearance by the FDA and by similar authorities in foreign countries. The lengthy process of seeking these approvals, and the ongoing process of compliance with applicable statutes and regulations, has and will continue to require the expenditure of substantial resources. Any failure by us or our collaborators or licensees to obtain, or any delay in obtaining, regulatory approvals could materially adversely affect the marketing of any products developed by us and our ability to receive product or royalty revenue. We have received Orphan Drug designation for certain therapeutic indications, which might under certain conditions, help to accelerate the process of drug development and commercialization. Alferon N Injection® is only approved for use in intra-lesional treatment of refractory or recurring external genital warts in patients 18 years of age or older. Use of Alferon N Injection® for other applications requires regulatory approval.

We are subject to various federal, state and local laws, regulations and recommendations relating to such matters as safe working conditions, laboratory and manufacturing practices, the experimental use of animals and the use of and disposal of hazardous or potentially hazardous substances, including radioactive compounds and infectious disease agents, used in connection with our research work. Our laboratory and production facility in New Brunswick, New Jersey is approved for the manufacture of Alferon N Injection® and we believe it is in substantial compliance with all material regulations. However, there can be no assurance that this facility, or facilities owned and operated by third parties that are utilized in the manufacture of our products, will be considered by the FDA to be in substantial compliance at the present time or in the future.

HUMAN RESOURCES

As of March 1, 2011, we had 56 personnel consisting of 29 full-time employees or consultants and 27 regulatory/research medical personnel on a part-time basis. Part-time personnel are paid on a per diem or monthly basis. 37 personnel are engaged in our research, development, clinical, and manufacturing effort. 19 of our personnel perform regulatory, general administration, data processing, including bio-statistics, financial and investor relations functions. We have no union employees and we believe our relationship with our employees is good.

While we have been successful in attracting skilled and experienced scientific personnel, there can be no assurance that we will be able to attract or retain the necessary qualified employees and/or consultants in the future.

SCIENTIFIC ADVISORY BOARD AND DATA SAFETY MONITORING BOARD

Our Scientific Advisory Board presently consists of two individuals who we believe have particular scientific and medical expertise in Virology, Cancer, Immunology, Biochemistry and related fields. Dr. James Rahal, Director of the Infectious Disease Section of New York Hospital Queens, is one of the nation's foremost experts on the West Nile Virus. Professor Luc Montagnier of the Institut Pasteur in Paris has devoted his career to the study of viruses and is perhaps best known for the 2008 receipt of the Nobel Prize in Medicine related to his discovery of the Human Immunodeficiency Virus ("HIV"). It is the role of this Board to advise us about current and long-term scientific planning including research and development. The Scientific Advisory Board conducts periodic meetings as needed. No Scientific Advisory Board meetings were held in 2010 or 2009, primarily due to fewer active scientific projects. However, individual Scientific Advisory Board Members sometime consult with and meet informally with our employees or Board Members. Members of the Scientific Advisory Board are employed by others and may have commitments to and/or consulting agreements with other entities, including our potential competitors.

In May 2010, we formed a Data Safety Monitoring Board ("DSMB") that consists of two independent regulatory and medical experts along with a Biostatistics expert. The function of the DSMB is to perform independent safety and efficacy analyses on our clinical trials with Alferon® LDO. However with Alferon® LDO study Phase II, double-blind, randomized, placebo controlled, dose-ranging study only released us from Clinical Hold on December 22, 2010, the DSMD has yet to take action.

ITEM 1A. Risk Factors.

The following cautionary statements identify important factors that could cause our actual results to differ materially from those projected in the forward-looking statements made in this Form 10-K. Among the key factors that have a direct bearing on our results of operations are:

Risks Associated With Our Business

No assurance of successful product development.

Ampligen® and related products. The development of Ampligen® and our other related products is subject to a number of significant risks. Ampligen® may be found to be ineffective or to have adverse side effects, fail to receive necessary regulatory clearances, be difficult to manufacture on a commercial scale, be uneconomical to market or be precluded from commercialization by proprietary right of third parties. Our investigational products are in various stages of clinical and pre-clinical development and require further clinical studies and appropriate regulatory approval processes before any such products can be marketed. We do not know when, if ever, Ampligen® or our other products will be generally available for commercial sale for any indication. Generally, only a small percentage of potential therapeutic products are eventually approved by the FDA for commercial sale. Please see the next risk

factor.

Alferon N Injection®. Although Alferon N Injection® is approved for marketing in the United States for the intra-lesional treatment of refractory or recurring external genital warts in patients 18 years of age or older, to date it has not been approved for other indications. We face many of the risks discussed above, with regard to developing this product for use to treat other ailments.

Our drug and related technologies are investigational and subject to regulatory approval. If we are unable to obtain regulatory approval, our operations will be significantly adversely affected.

All of our drugs and associated technologies, other than Alferon N Injection®, are investigational and must receive prior regulatory approval by appropriate regulatory authorities for commercial distribution and sale and are currently legally available only through clinical trials with specified disorders. At present, Alferon N Injection® is only approved for the intra-lesional treatment of refractory or recurring external genital warts in patients 18 years of age or older. Use of Alferon N Injection® for other indications will require regulatory approval.

Our products, including Ampligen®, are subject to extensive regulation by numerous governmental authorities in the United States ("U.S.") and other countries, including, but not limited to, the FDA in the U.S., the Health Protection Branch ("HPB") of Canada, and the Agency for the Evaluation of Medicinal Products ("EMEA") in Europe. Obtaining regulatory approvals is a rigorous and lengthy process and requires the expenditure of substantial resources. In order to obtain final regulatory approval of a new drug, we must demonstrate to the satisfaction of the regulatory agency that the product is safe and effective for its intended uses and that we are capable of manufacturing the product to the applicable regulatory standards. We require regulatory approval in order to market Ampligen® or any other proposed product and receive product revenues or royalties. We cannot assure you that Ampligen® will ultimately be demonstrated to be safe or efficacious. While Ampligen® is authorized for use in clinical trials in the U.S. and Europe, we cannot assure you that additional clinical trial approvals will be authorized in the United States or in other countries, in a timely fashion or at all, or that we will complete these clinical trials. In addition, although Ampligen® has been authorized by the FDA for treatment use under certain conditions, including provision for cost recovery, there can be no assurance that such authorization will continue in effect.

In July 2008, the FDA accepted for review our New Drug Application ("NDA") for Ampligen® to treat CFS, originally submitted in October 2007. In November 2009, we received a Complete Response Letter ("CRL") from the FDA which described specific additional recommendations related to the Ampligen® NDA. Please see "Our Products; Ampligen®" in "Item 1. Business" above for more detailed information on the current status of the NDA and CRL.

Alferon® LDO is undergoing pre-clinical testing for possible prophylaxis against influenza. While the studies to date have been encouraging, preliminary testing in the laboratory and in animal models is not necessarily predictive of successful results in clinical testing or human treatment. No assurance can be given that similar results will be observed in clinical trials. Use of Alferon® as a possible treatment of any influenza requires prior regulatory approval. In October 2009, we submitted a protocol to the FDA proposing to conduct a Phase II study for the prophylaxis and treatment of seasonal and pandemic influenza of more than 200 subjects. As discussed in "Our Products; Alferon® Low Dose Oral (LDO)", in November 2009, the FDA placed the proposed study on clinical hold. On December 22, 2010, the FDA informed us that the Agency had completed its review of our complete response to the Clinical Hold and lifted the Clinical Hold, allowing our Phase II Study to proceed.

If we are unable to generate the additional data required by the FDA or if, for that or any other reason, Ampligen® or one of our other products does not receive regulatory approval in the U.S. or elsewhere, our operations most likely will be materially adversely affected.

We may continue to incur substantial losses and our future profitability is uncertain.

We began operations in 1966 and last reported net profit from 1985 through 1987. Since 1987, we have incurred substantial operating losses, as we pursued our clinical trial effort to get our experimental drug, Ampligen®, approved. As of December 31, 2010, our accumulated deficit was approximately $(217,725,000). We have not yet generated significant revenues from our products and may incur substantial and increased losses in the future. We cannot assure that we will ever achieve significant revenues from product sales or become profitable. We require, and will continue to require, the commitment of substantial resources to develop our products. We cannot assure that our product development efforts will be successfully completed or that required regulatory approvals will be obtained or that any products will be manufactured and marketed successfully, or be profitable.

We may require additional financing which may not be available.

The development of our products will require the commitment of substantial resources to conduct the time consuming research, preclinical development, and clinical trials that are necessary to bring pharmaceutical products to market. As of December 31, 2010, we had approximately $44,387,000 in Cash, Cash Equivalents and Marketable Securities. Given the harsh economic conditions, we continue to review every aspect of our operations for cost and spending reductions to assure our long-term financial stability while maintaining the resources necessary to achieve our primary objectives of obtaining NDA approval of Ampligen®, and securing a strategic partner.

If we are unable to commercialize and sell Ampligen® or Alferon® LDO and/or recommence and increase sales of Alferon N Injection® or our other products, we eventually may need to secure other sources of funding through additional equity or debt financing or other sources in order to satisfy our working capital needs and/or complete the necessary clinical trials and the regulatory approval processes on which the commercialization of our products depends.

Our ability to raise additional funds from the sale of equity securities is limited. In this regard, we only have approximately 32,200,000 shares authorized but unissued and unreserved. We were unable to gather the requisite votes at our annual stockholders' meeting held on June 24, 2009 to amend our Certificate of Incorporation to increase the number of authorized shares of Common Stock from 200,000,000 to 350,000,000. Since we have not been able to obtain approval to increase the number of authorized shares of Common Stock, the amount of proceeds we may receive from the sale of our remaining Common Stock is limited.

There can be no assurances that we will raise adequate funds which may have a material adverse effect on our ability to develop our products or continue our operations.

Our Alferon N Injection® Commercial Sales were halted due to lack of finished goods inventory.

Commercial sales of Alferon N Injection® were halted in March 2008 when our finished goods inventory expired. As a result, we have no finished good product to sell at this time. We have undertaken a major capital improvement program that continues in 2011 to enhance our manufacturing capability to produce the purified drug concentrate used in the formulation of Alferon N Injection® at our New Brunswick facility. As a result, we anticipate that new lots of Alferon N Injection® could potentially be available in mid to late 2011. However our agreement with a third party to formulate, package and label Alferon N Injection® has expired and we are seeking to either promptly renew our prior agreement with a third-party vendor or find another vendor that can provide the needed FDA approved services to be

able to complete the manufacture of Alferon N Injection® (see “Manufacturing” in Item 1. Business). Also, certain of the plant and equipment improvements being implemented for production of Alferon N Injection® may require FDA review prior to sale of resulting product, and each production lot of Alferon N Injection® is subject to FDA review and approval prior to releasing the lots to be sold. In light of these contingencies, there can be no assurances that the approved Alferon N Injection® product will be returned to production on a timely basis, if at all, or that if and when it is again made commercially available, it will return to prior sales levels.

Although preliminary in vitro testing indicates that Ampligen® enhances the effectiveness of different drug combinations on avian influenza, preliminary testing in the laboratory is not necessarily predictive of successful results in clinical testing or human treatment.

Ampligen® has been tested as a vaccine adjuvant for H5N1, a pathogenic avian influenza virus ("HPAIV") in Japan, where the preclinical data has shown activity in preventing lethal challenge with the original virus used for vaccination as well as the other related, but not identical, isolates of H5N1 virus (i.e., cross-reactivity). With the collaboration agreements expired, it is unknown if or when the clinical testing phase of Ampligen® will be undertaken in Japan (see "Item 2: Management's Discussion and Analysis of Financial Condition and Results of Operations; Overview; General" in Part I above). No assurance can be given that similar results will be observed in clinical trials. Use of Ampligen® in the treatment of influenza requires prior regulatory approval. Only the FDA or other corresponding regulatory agencies world-wide can determine whether a drug is safe, effective and appropriate for treating a specific application. As discussed above, obtaining regulatory approvals is a rigorous and lengthy process (see "Our drugs and related technologies are investigational and subject to regulatory approval. If we are unable to obtain regulatory approval, our operations will be significantly adversely affected" above).

We may not be profitable unless we can protect our patents and/or receive approval for additional pending patents.

We need to preserve and acquire enforceable patents covering the use of Ampligen® for a particular disease in order to obtain exclusive rights for the commercial sale of Ampligen® for such disease. We obtained all rights to Alferon N Injection®, and we plan to preserve and acquire enforceable patents covering its use for existing and potentially new diseases. Our success depends, in large part, on our ability to preserve and obtain patent protection for our products and to obtain and preserve our trade secrets and expertise. Certain of our know-how and technology is not patentable, particularly the procedures for the manufacture of our experimental drug, Ampligen®. We also have been issued patents on the use of Ampligen® in combination with certain other drugs for the treatment of chronic Hepatitis B virus, chronic Hepatitis C virus, and a patent which affords protection on the use of Ampligen® in patients with Chronic Fatigue Syndrome. We have not yet been issued any patents in the United States for the use of Ampligen® as a sole treatment for any of the cancers which we have sought to target. With regard to Alferon N Injection®, we have acquired from ISI its patents for natural alpha interferon produced from human peripheral blood leukocytes and its production process and we have filed a patent application for the use of Alferon® LDO in treating viral diseases including avian influenza. We cannot assure that our competitors will not seek and obtain patents regarding the use of similar products in combination with various other agents, for a particular target indication prior to our doing so. If we cannot protect our patents covering the use of our products for a particular disease, or obtain additional patents, we may not be able to successfully market our products.

The patent position of biotechnology and pharmaceutical firms is highly uncertain and involves complex legal and factual questions.

To date, no consistent policy has emerged regarding the breadth of protection afforded by pharmaceutical and biotechnology patents. There can be no assurance that new patent applications relating to our products or technology will result in patents being issued or that, if issued, such patents will afford meaningful protection against competitors with similar technology. It is generally anticipated that there may be significant litigation in the industry regarding patent and intellectual property rights. Such litigation could require substantial resources from us and we may not have the financial resources necessary to enforce the patent rights that we hold. No assurance can be made that our patents will provide competitive advantages for our products or will not be successfully challenged by competitors. No assurance can be given that patents do not exist or could not be filed which would have a materially adverse effect on our ability to develop or market our products or to obtain or maintain any competitive position that we may achieve with respect to our products. Our patents also may not prevent others from developing competitive products using related technology.

There can be no assurance that we will be able to obtain necessary licenses if we cannot enforce patent rights we may hold. In addition, the failure of third parties from whom we currently license certain proprietary information or from whom we may be required to obtain such licenses in the future, to adequately enforce their rights to such proprietary information, could adversely affect the value of such licenses to us.

If we cannot enforce the patent rights we currently hold we may be required to obtain licenses from others to develop, manufacture or market our products. There can be no assurance that we would be able to obtain any such licenses on commercially reasonable terms, if at all. We currently license certain proprietary information from third parties, some of which may have been developed with government grants under circumstances where the government maintained certain rights with respect to the proprietary information developed. No assurances can be given that such third parties will adequately enforce any rights they may have or that the rights, if any, retained by the government will not adversely affect the value of our license.

There is no guarantee that our trade secrets will not be disclosed or known by our competitors.

To protect our rights, we require all employees and certain consultants to enter into confidentiality agreements with us. There can be no assurance that these agreements will not be breached, that we would have adequate and enforceable remedies for any breach, or that any trade secrets of ours will not otherwise become known or be independently developed by competitors.

We have limited marketing and sales capability. If we are unable to obtain additional distributors and our current and future distributors do not market our products successfully, we may not generate significant revenues or become profitable.

We have limited marketing and sales capability. We are dependent upon existing and, possibly future, marketing agreements and third party distribution agreements for our products in order to generate significant revenues and become profitable. As a result, any revenues received by us will be dependent in large part on the efforts of third parties, and there is no assurance that these efforts will be successful.

Our commercialization strategy for Ampligen® for ME/CFS may include licensing/co-marketing agreements utilizing the resources and capacities of a strategic partner(s). We continue to seek world-wide marketing partner(s), with the goal of having a relationship in place before approval is obtained. In parallel to partnering discussions, appropriate premarketing activities will be undertaken. We intend to control manufacturing of Ampligen® on a world-wide basis.

We cannot assure that our U.S. or foreign marketing strategy will be successful or that we will be able to establish future marketing or third party distribution agreements on terms acceptable to us, or that the cost of establishing these arrangements will not exceed any product revenues. Our inability to establish viable marketing and sales capabilities would most likely have a materially adverse effect on us.

There are no long-term agreements with suppliers of required materials and services. If we are unable to obtain the required raw materials and/or services, we may not be able to manufacture Alferon N Injection® and/or Ampligen®.

A number of essential materials are used in the production of Alferon N Injection®. We do not have, but are working towards having long-term agreements for the supply of such materials. There can be no assurance we can enter into long-term supply agreements covering essential materials on commercially reasonable terms, if at all.

There are a limited number of organizations in the United States available to provide the final steps in the in manufacturing Alferon N Injection®. At present, we currently do not have an agreement with a third-party vendor to provide needed cGMP formulation, packaging and labeling services related to the final steps to manufacture of Alferon N Injection®. We are currently in negotiations with potential third-party vendors to provide such services necessary to complete the manufacture of Alferon N Injection® as to allow for potential commercial sales by mid to late 2011.

There are a limited number of manufacturers in the United States available to provide the polymers for use in manufacturing Ampligen®. At present, we do not have any agreements with third parties for the supply of any of these polymers. We have established relevant manufacturing operations within our New Brunswick, New Jersey facility for the production of Ampligen® polymers from raw materials in order to obtain polymers on a more consistent manufacturing basis in the quantities necessary for clinical testing.

If we are unable to obtain or manufacture the required raw materials, as well as procure services needed in the final steps in the manufacturing process, we may be unable to manufacture Alferon N Injection® and/or Ampligen®. The costs and availability of products and materials we need for the production of Ampligen® and the commercial production of Alferon N Injection® and other products which we may commercially produce are subject to fluctuation depending on a variety of factors beyond our control, including competitive factors, changes in technology, and FDA and other governmental regulations and there can be no assurance that we will be able to obtain such products and materials on terms acceptable to us or at all.

There is no assurance that successful manufacture of a drug on a limited scale basis for investigational use will lead to a successful transition to commercial, large-scale production.

Changes in methods of manufacturing, including commercial scale-up, may affect the chemical structure of Ampligen® and other RNA drugs, as well as their safety and efficacy. The transition from limited production of pre-clinical and clinical research quantities to production of commercial quantities of our products will involve distinct management and technical challenges and will require additional management and technical personnel and capital to the extent such manufacturing is not handled by third parties. There can be no assurance that our manufacturing will be successful or that any given product will be determined to be safe and effective, or capable of being manufactured under applicable quality standards, economically, and in commercial quantities, or successfully marketed.

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We have limited manufacturing experience.

Ampligen® has been produced to date in limited quantities for use in our clinical trials, and we are dependent upon a qualified third party supplier for the manufacturing and packaging process. The failure to continue these arrangements or to achieve other such arrangements on satisfactory terms could have a material adverse effect on us. Also, to be successful, our products must be manufactured in commercial quantities in compliance with regulatory requirements and at acceptable costs. To the extent we are involved in the production process, our current facilities may not be adequate for the production of our proposed products for large-scale commercialization. We intend to utilize third party facilities if and when the need arises or, if we are unable to do so, to build or acquire commercial-scale manufacturing facilities. We will need to comply with regulatory requirements for such facilities, including those of the FDA pertaining to cGMP requirements. There can be no assurance that such facilities can be used, built, or acquired on commercially acceptable terms, or that such facilities, if used, built, or acquired, will be adequate for our long-term needs.

We may not be profitable unless we can produce Ampligen® or other products in commercial quantities at costs acceptable to us.

We have never produced Ampligen® or any other products in large commercial quantities. We must manufacture our products in compliance with regulatory requirements in large commercial quantities and at acceptable costs in order for us to be profitable. We intend to utilize third-party manufacturers and/or facilities if and when the need arises or, if we are unable to do so, to build or acquire commercial-scale manufacturing facilities. If we cannot manufacture commercial quantities of Ampligen® or enter into third party agreements for its manufacture at costs acceptable to us, our operations will be significantly affected. Also, each production lot of Alferon N Injection® is subject to FDA review and approval prior to releasing the lots to be sold. This review and approval process could take considerable time, which would delay our having product in inventory to sell.

Rapid technological change may render our products obsolete or non-competitive.

The pharmaceutical and biotechnology industries are subject to rapid and substantial technological change. Technological competition from pharmaceutical and biotechnology companies, universities, governmental entities and others diversifying into the field is intense and is expected to increase. Most of these entities have significantly greater research and development capabilities than us, as well as substantial marketing, financial and managerial resources, and represent significant competition for us. There can be no assurance that developments by others will not render our products or technologies obsolete or noncompetitive or that we will be able to keep pace with technological developments.

Our products may be subject to substantial competition.

Ampligen®. Competitors may be developing technologies that are, or in the future may be, the basis for competitive products. Some of these potential products may have an entirely different approach or means of accomplishing similar therapeutic effects to products being developed by us. These competing products may be more effective and less costly than our products. In addition, conventional drug therapy, surgery and other more familiar treatments may offer competition to our products. Furthermore, many of our competitors have significantly greater experience than us in preclinical testing and human clinical trials of pharmaceutical products and in obtaining FDA, HPB and other regulatory approvals of products. Accordingly, our competitors may succeed in obtaining FDA, HPB or other regulatory product approvals more rapidly than us. There are no drugs approved for commercial sale with respect to treating ME/CFS in the United States. The dominant competitors with drugs to treat disease indications in which we plan to address include Gilead Sciences, Pfizer, Bristol-Myers Squibb, Abbott Laboratories, GlaxoSmithKline and Merck. These potential competitors are among the largest pharmaceutical companies in the world, are well known to

the public and the medical community, and have substantially greater financial resources, product development, and manufacturing and marketing capabilities than we have. Although we believe our principal advantage is the unique mechanism of action of Ampligen® on the immune system, we cannot assure that we will be able to compete.

ALFERON N Injection®. Our competitors are among the largest pharmaceutical companies in the world, are well known to the public and the medical community, and have substantially greater financial resources, product development, and manufacturing and marketing capabilities than we have. Alferon N Injection® currently competes with Schering's injectable recombinant alpha interferon product (INTRON® A) for the treatment of genital warts. 3M Pharmaceuticals also offer competition from its immune-response modifier, Aldara®, a self-administered topical cream, for the treatment of external genital and perianal warts. In addition, Medigene AG has FDA approval for a self-administered ointment, Veregen®, which is indicated for the topical treatment of external genital and perianal warts. Alferon N Injection® also competes with surgical, chemical, and other methods of treating genital warts. We cannot assess the impact products developed by our competitors, or advances in other methods of the treatment of genital warts, will have on the commercial viability of Alferon N Injection®. If and when we obtain additional approvals of uses of this product, we expect to compete primarily on the basis of product performance. Our competitors have developed or may develop products (containing either alpha or beta interferon or other therapeutic compounds) or other treatment modalities for those uses. There can be no assurance that, if we are able to obtain regulatory approval of Alferon N Injection® for the treatment of new indications, we will be able to achieve any significant penetration into those markets. In addition, because certain competitive products are not dependent on a source of human blood cells, such products may be able to be produced in greater volume and at a lower cost than Alferon N Injection®. Currently, our wholesale price on a per unit basis of Alferon N Injection® is higher than that of the competitive recombinant alpha and beta interferon products.

General. Other companies may succeed in developing products earlier than we do, obtaining approvals for such products from the FDA more rapidly than we do, or developing products that are more effective than those we may develop. While we will attempt to expand our technological capabilities in order to remain competitive, there can be no assurance that research and development by others or other medical advances will not render our technology or products obsolete or non-competitive or result in treatments or cures superior to any therapy we develop.

Possible side effects from the use of Ampligen® or Alferon N Injection® could adversely affect potential revenues and physician/patient acceptability of our product.

Ampligen®. We believe that Ampligen® has been generally well tolerated with a low incidence of clinical toxicity, particularly given the severely debilitating or life threatening diseases that have been treated. A mild flushing reaction has been observed in approximately 15-20% of patients treated in our various studies. This reaction is occasionally accompanied by a rapid heart beat, a tightness of the chest, urticaria (swelling of the skin), anxiety, shortness of breath, subjective reports of "feeling hot", sweating and nausea. The reaction is usually infusion-rate related and can generally be controlled by reducing the rate of infusion. Other adverse side effects include liver enzyme level elevations, diarrhea, itching, asthma, low blood pressure, photophobia, rash, transient visual disturbances, slow or irregular heart rate, decreases in platelets and white blood cell counts, anemia, dizziness, confusion, elevation of kidney function tests, occasional temporary hair loss and various flu-like symptoms, including fever, chills, fatigue, muscular aches, joint pains, headaches, nausea and vomiting. These flu-like side effects typically subside within several months. One or more of the potential side effects might deter usage of Ampligen® in certain clinical situations and therefore, could adversely affect potential revenues and physician/patient acceptability of our product.

Alferon N Injection®. At present, Alferon N Injection® is only approved for the intra-lesional (within the lesion) treatment of refractory or recurring external genital warts in adults. In clinical trials conducted for the treatment of genital warts with Alferon N Injection®, patients did not experience serious side effects; however, there can be no assurance that unexpected or unacceptable side effects will not be found in the future for this use or other potential uses of Alferon N Injection® which could threaten or limit such product's usefulness.

We may be subject to product liability claims from the use of Ampligen®, Alferon N Injection®, or other of our products which could negatively affect our future operations. We have limited product liability insurance.

We face an inherent business risk of exposure to product liability claims in the event that the use of Ampligen® or other of our products results in adverse effects. This liability might result from claims made directly by patients, hospitals, clinics or other consumers, or by pharmaceutical companies or others manufacturing these products on our behalf. Our future operations may be negatively affected from the litigation costs, settlement expenses and lost product sales inherent to these claims. While we will continue to attempt to take appropriate precautions, we cannot assure that we will avoid significant product liability exposure.

We maintain Products Liability and Clinical Trial insurance coverage for Ampligen® and Alferon®. However even with retaining products liability and clinical trial insurance coverage for Ampligen®, Alferon N Injection® and Alferon® LDO, a claim against the products could have a materially adverse effect on our business and financial condition.

We face an inherent business risk of exposure to product liability claims in the event that the use of Ampligen® or other of our products results in adverse effects. This liability might result from claims made directly by patients, hospitals, clinics or other consumers, or by pharmaceutical companies or others manufacturing these products on our behalf. Our future operations may be negatively affected from the litigation costs, settlement expenses and lost product sales inherent to these claims. While we will continue to attempt to take appropriate precautions, we cannot assure that we will avoid significant product liability exposure.

The loss of services of key personnel including Dr. William A. Carter could hurt our chances for success.

Our success is dependent on the continued efforts of our staff, especially certain doctors and researchers along with the continued efforts of Dr. William A. Carter because of his position as a pioneer in the field of nucleic acid drugs, his being the co-inventor of Ampligen®, and his knowledge of our overall activities, including patents and clinical trials. The loss of the services of Dr. Carter or other personnel key to our operations, could have a material adverse effect on our operations and chances for success. As a cash conservation measure, we have elected to discontinue the Key Man life insurance on the life of Dr. Carter. An employment agreement continues to exist with Dr. Carter that, as amended, runs until December 31, 2015. However, Dr. Carter has the right to terminate his employment upon not less than 30 days prior written notice. The loss of Dr. Carter or other key personnel or the failure to recruit additional personnel as needed could have a materially adverse effect on our ability to achieve our objectives.

Uncertainty of health care reimbursement for our products.

Our ability to successfully commercialize our products will depend, in part, on the extent to which reimbursement for the cost of such products and related treatment will be available from government health administration authorities, private health coverage insurers and other organizations. Significant uncertainty exists as to the reimbursement status of newly approved health care products, and from time to time legislation is proposed, which, if adopted, could further restrict the prices charged by and/or amounts reimbursable to manufacturers of pharmaceutical products. We cannot predict what, if any, legislation will ultimately be adopted or the impact of such legislation on us. There can be no assurance that third party insurance companies will allow us to charge and receive payments for products sufficient to realize an appropriate return on our investment in product development.

There are risks of liabilities associated with handling and disposing of hazardous materials.

Our business involves the controlled use of hazardous materials, carcinogenic chemicals, flammable solvents and various radioactive compounds. Although we believe that our safety procedures for handling and disposing of such materials comply in all material respects with the standards prescribed by applicable regulations, the risk of accidental contamination or injury from these materials cannot be completely eliminated. In the event of such an accident or the failure to comply with applicable regulations, we could be held liable for any damages that result, and any such liability could be significant. We do not maintain insurance coverage against such liabilities.

A Number of Purported Class Action Lawsuits Have Been Filed Against Us and We May Be Subject to Civil Liabilities.

A number of purported class action lawsuits have been filed against us alleging securities fraud. The complaints have sought monetary damages, costs, attorneys' fees, and other equitable and injunctive relief. Securities class action suits and derivative suits are often brought against companies following periods of volatility in the market price of their securities. Defending against these suits, even if meritless, can result in substantial costs to us and could divert the attention of our Management.

While most of the class action lawsuits have, or are in the process of being settled, the existence of these proceedings or any additional such proceedings that may be filed in the future could have a material adverse effect on our ability to access the capital markets to raise additional funds. Adverse results in some or all of these legal proceedings could be material to our results of operations, financial condition or cash flows.

Risks Associated With an Investment in Our Common Stock

The market price of our stock may be adversely affected by market volatility.

The market price of our common stock has been and is likely to be volatile. This is especially true given the current significant instability in the financial markets. In addition to general economic, political and market conditions, the price and trading volume of our stock could fluctuate widely in response to many factors, including:

- announcements of the results of clinical trials by us or our competitors;
- announcement of legal actions against us and/or settlements or verdicts adverse to us;
- adverse reactions to products;
- governmental approvals, delays in expected governmental approvals or withdrawals of any prior governmental approvals or public or regulatory agency comments regarding the safety or effectiveness of our products, or the adequacy of the procedures, facilities or controls employed in the manufacture of our products;

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- changes in U.S. or foreign regulatory policy during the period of product development;
- developments in patent or other proprietary rights, including any third party challenges of our intellectual property rights;
- announcements of technological innovations by us or our competitors;
- announcements of new products or new contracts by us or our competitors;
- actual or anticipated variations in our operating results due to the level of development expenses and other factors;
- changes in financial estimates by securities analysts and whether our earnings meet or exceed the estimates;
- conditions and trends in the pharmaceutical and other industries;
- new accounting standards;
- overall investment market fluctuation;
- restatement of financial results; and
- occurrence of any of the risks described in these "Risk Factors".

Our common stock is listed for quotation on the NYSE Amex. For the 12 month period ended December 31, 2010, the closing price of our common stock has ranged from $0.44 to $0.87 per share. We expect the price of our common stock to remain volatile. The average daily trading volume of our common stock varies significantly.

In the past, following periods of volatility in the market price of the securities of companies in our industry, securities class action litigation has often been instituted against companies in our industry. In this regard, please see “A Number of Purported Class Action Lawsuits Have Been Filed Against Us and We May Be Subject to Civil Liabilities” above.

Our stock price may be adversely affected if a significant amount of shares are sold in the public market.

In May 2009 we issued an aggregate of 25,543,339 shares and warrants to purchase an additional 14,708,687 shares under a universal shelf registration statement. 4,895,000 of these warrants have been exercised as of December 31, 2010. Depending upon market conditions, we anticipate selling 9,813,687 shares pursuant to the conversion of remaining warrants.

Additionally, we registered with the SEC on September 29, 2009, 1,038,527 shares issuable upon exercise of certain other warrants. To the extent the exercise price of our outstanding warrants is less than the market price of the common stock, the holders of the warrants are likely to exercise them and sell the underlying shares of common stock and to the extent that the exercise price of certain of these warrants are adjusted pursuant to anti-dilution protection, the warrants could be exercisable or convertible for even more shares of common stock. We also may issue shares to be used to meet our capital requirements or use shares to compensate employees, consultants and/or directors. In this regard we have registered $150,000,000 of securities for public sale pursuant to a universal shelf registration. We have allocated 32,000,000 shares under this registration statement to an At-The-Market equity offering and, as of December 31, 2010, we have sold 520,000 shares pursuant to this offering.

We are unable to estimate the amount, timing or nature of future sales of outstanding common stock or instruments convertible into or exercisable for our common stock. Sales of substantial amounts of our common stock in the public market, including additional sale of securities pursuant to the universal shelf registration statement or upon exercise of outstanding options, could cause the market price for our common stock to decrease. Furthermore, a decline in the price of our common stock would likely impede our ability to raise capital through the issuance of additional shares of common stock or other equity securities.

Provisions of our Certificate of Incorporation and Delaware law could defer a change of our management which could discourage or delay offers to acquire us.

Provisions of our Certificate of Incorporation and Delaware law may make it more difficult for someone to acquire control of us or for our stockholders to remove existing management, and might discourage a third party from offering to acquire us, even if a change in control or in Management would be beneficial to our stockholders. For example, our Certificate of Incorporation allows us to issue shares of preferred stock without any vote or further action by our stockholders. Our Board of Directors has the authority to fix and determine the relative rights and preferences of preferred stock. Our Board of Directors also has the authority to issue preferred stock without further stockholder approval. As a result, our Board of Directors could authorize the issuance of a series of preferred stock that would grant to holders the preferred right to our assets upon liquidation, the right to receive dividend payments before dividends are distributed to the holders of common stock and the right to the redemption of the shares, together with a premium, prior to the redemption of our common stock. In this regard, in November 2002, we adopted a Stockholder Rights Plan ("Rights Plan") and, under the Rights Plan, our Board of Directors declared a dividend distribution of one Right for each outstanding share of Common Stock to stockholders of record at the close of business on November 29, 2002. Each Right initially entitles holders to buy one-hundredth unit of preferred stock for $30.00. The Rights generally are not transferable apart from the common stock and will not be exercisable unless and until a person or group acquires or commences a tender or exchange offer to acquire, beneficial ownership of 15% or more of our common stock. However, for Dr. Carter, our Chief Executive Officer, who already beneficially owns 5.65% of our common stock, the Rights Plan's threshold will be 20%, instead of 15%. The Rights Plan will expire on November 19, 2012, and may be redeemed prior thereto at $.01 per Right under certain circumstances.

Special Note Regarding Forward Looking Statements

Because the risk factors referred to above could cause actual results or outcomes to differ materially from those expressed in any forward-looking statements made by us, you should not place undue reliance on any such forward-looking statements. Further, any forward-looking statement speaks only as of the date on which it is made and we undertake no obligation to update any forward-looking statement or statements to reflect events or circumstances after the date on which such statement is made or reflect the occurrence of unanticipated events. New factors emerge from time to time, and it is not possible for us to predict which will arise. In addition, we cannot assess the impact of each factor on our business or the extent to which any factor, or combination of factors, may cause actual results to differ materially from those contained in any forward-looking statements. Our research in clinical efforts may continue for the next several years and we may continue to incur losses due to clinical costs incurred in the development of Ampligen® for commercial application. Possible losses may fluctuate from quarter to quarter as a result of differences in the timing of significant expenses incurred and receipt of licensing fees and/or cost recovery treatment revenue.

ITEM 1B. Unresolved Staff Comments.

None.

ITEM 2. Properties.

We currently lease our headquarters located in Philadelphia, Pennsylvania consisting of a suite of offices of approximately 9,000 square feet. We also currently own, occupy and use our New Brunswick, New Jersey laboratory and production facility that we acquired from ISI. These facilities consist of two buildings located on 2.8 acres. One building is a two story facility consisting of a total of 31,300 square feet. This facility contains offices, laboratories, production space and shipping and receiving areas. It also contains space designated for research and development, our pharmacy, packaging, quality assurance and quality control laboratories. Building Two has 11,670 square feet

consisting of offices, laboratories and warehouse space. The property has parking space for approximately 100 vehicles.

ITEM 3. Legal Proceedings.

Please see “Note 14 – Contingencies” under Notes to Consolidated Financial Statements.

ITEM 4. Removed and Reserved

PART II

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

In 2010, we issued shares of common stock consisting of: 1) 498,867 shares in payment to vendors and consultants for services rendered; 2) 520,000 shares sold at the market; and 3) 1,435,295 shares to our employees for final distribution of shares from the stock for pay program started in 2009.

The foregoing issuances of securities were private transactions and exempt from registration under section 4(2) of the Securities Act and/or regulation D rule 506 promulgated under the Securities Act.

Since October 1997 our common stock has been listed and traded on the NYSE Amex under the symbol HEB. The following table sets forth the high and low list prices for our Common Stock for the last two fiscal years as reported by the NYSE Amex. Such prices reflect inter-dealer prices, without retail mark-up, mark-downs or commissions and may not necessarily represent actual transactions.

COMMON STOCK Time Period:	High	Low
January 1, 2010 through March 31, 2010	0.84	0.56
April 1, 2010 through June 30, 2010	0.87	0.44
July 1, 2010 through September 30, 2010	0.62	0.44
October 1, 2010 through December 31, 2010	0.57	0.46
January 1, 2009 through March 31, 2009	0.84	0.26
April 1, 2009 through June 30, 2009	4.54	0.44
July 1, 2009 through September 30, 2009	3.58	1.86
October 1, 2009 through December 31, 2009	2.16	0.54

As of March 1, 2011, there were approximately 221 holders of record of our Common Stock. This number was determined from records maintained by our transfer agent and does not include beneficial owners of our securities whose securities are held in the names of various dealers and/or clearing agencies.

On March 1, 2011, the last sale price for our common stock on the NYSE Amex was $0.46 per share.

We have not paid any cash dividends on our Common Stock in recent years. It is management's intention not to declare or pay dividends on our Common Stock, but to retain earnings, if any, for the operation and expansion of our business.

The following table gives information about our Common Stock that may be issued upon the exercise of options, warrants and rights under all of our equity compensation plans as of December 31, 2010:

Plan Category	Number of Securities to be issued upon exercise of outstanding options, warrants and rights (a)	Weighted-average Exercise price of Outstanding options, warrants and rights (b)	Number of securities Remaining available for future issuance under equity compensation plans (excluding securities reflected in column) (a) (c)
Equity compensation plans approved by security holders:	10,332,912	$ 2.28	3,411,560
Equity compensation plans not approved by security holders:	10,983,246	$ 1.61	-
Total	21,316,158	$ 1.93	3,411,560

PERFORMANCE GRAPH

Total Return To Shareholders
(Includes reinvestment of dividends)
ANNUAL RETURN PERCENTAGE

	Years Ending				
Company Name / Index	Dec06	Dec07	Dec08	Dec09	Dec10
Hemispherx Biopharma, Inc.	1.38	-65.45	-52.63	55.56	-11.88
S&P SmallCap 600 Index	15.12	-0.30	-31.07	25.57	26.31
Peer Group	22.33	-20.65	-70.17	67.87	-44.07

INDEXED RETURNS

	Base Period	Years Ending				
Company Name / Index	Dec05	Dec06	Dec07	Dec08	Dec09	Dec10
Hemispherx Biopharma, Inc.	100	101.38	35.02	16.59	25.81	22.74
S&P SmallCap 600 Index	100	115.12	114.78	79.11	99.34	125.47
Peer Group	100	122.33	97.08	28.95	48.60	27.18

Peer Group Companies
CARDIUM THERAPEUTICS INC
CYTRX CORP

GENVEC INC
OXIGENE INC
REGENERX
BIOPHARMACEUTICALS

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ITEM 6. Selected Financial Data (in thousands except for share and per share data).

The selected consolidated financial data set forth below should be read in conjunction with our consolidated financial statements, and the related notes thereto, and “Management’s Discussion and Analysis of Financial Condition and Results of Operations”, included in this Annual Report. The statement of operations and balance sheet data presented below for, and as of the end of, each of the years in the five year period ended December 31, 2010 are derived from our audited consolidated financial statements. Historical results are not necessarily indicative of the results to be expected in the future.

Year Ended December 31	2006	2007	2008	2009	2010
Statement of Operations Data:					
Revenues and License fee Income	$933	$1,059	$265	$111	$135
Total Costs and Expenses(1)	19,627	20,348	13,076	13,375	16,522
Interest Expense and Financing Costs(2)	1,259	396	-	241	11
Redeemable warrants valuation adjustment	-	-	-	(6,258	