ICAGEN

ION CHANNEL ADVANCES

2006 ANNUAL REPORT

ICAGEN Inc.
ION CHANNEL ADVANCES

To our shareholders:

This past year has been one of both significant accomplishments and challenges for Icagen. For example, we have made excellent progress in our pain, epilepsy and inflammation programs. While we were challenged by the recent termination of our Phase III clinical study of senicapoc for sickle cell disease, which attempted to translate the significant hematological improvements we see in sickle cell disease patients taking senicapoc to a reduction in vaso-occlusive crisis rate, we believe that this compound may have utility for other indications and disease conditions. Closing the chapter on the vaso-occlusive crisis indication, although disappointing, presents an opportunity to realign our resources on our other programs, which may ultimately create even greater opportunities for the Company and its shareholders. Key value drivers for Icagen over the coming years will be identifying new drug treatments for pain, epilepsy and inflammatory disorders.

Pain is certainly not a simple problem, wherein one approach will treat all types of pain, or even all patients with similar pain types. Therefore, our approach is to tackle this area from many angles, through the modulation of specific subtypes of ion channels. We have no fewer than six programs seeking new approaches to pain therapy.

Our epilepsy approach is different from our pain approach, since we have found one target for which our compound modulators have activity in a broad array of models of differing types of epilepsy. This program is yielding novel chemical entities which we plan to test in clinical studies of epilepsy as well as other neuroexcitability disorders in the near term.

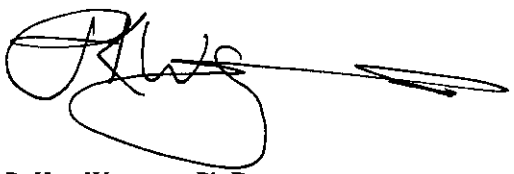
Finally, in our inflammation program, we have identified a compound that acts by a new mechanism of action to modulate immune system cellular function, thereby decreasing signs and symptoms of inflammation. We are exploring the utility of this compound in inflammatory and proliferative conditions of the cardiovascular and pulmonary systems.

Complementing our internal pipeline, we continue our partnerships with three leading pharmaceutical companies – McNeil, a subsidiary of Johnson & Johnson, Bristol-Myers Squibb and Astellas. Additional partnerships may be considered to leverage the portfolio of opportunities afforded by our ion channel technology platform.

During 2006, we expanded our Board of Directors and management team. We welcomed Adeoye Olukotun, M.D., MPH, FACC to our Board. With a distinguished career in clinical drug development, Dr. Olukotun has brought a valuable new perspective to our Board. We were also joined by Seth Hetherington, M.D. as our Senior Vice President, Clinical and Regulatory Affairs. With over twenty-five years of experience in academic medicine and clinical drug development, Dr. Hetherington has an ideal background to lead our clinical team.

Looking ahead, we are excited by the prospects before us. We have a strong pipeline of programs, and will continue to invest in these as we seek to identify new treatments based upon our ion channel expertise. We believe that our core ion channel technology platform, from which all of the programs in our pipeline have been generated, affords an array of opportunities for the development of novel therapeutics for patients with a wide range of diseases and disorders.

I would like to acknowledge the efforts of our employees and our Board of Directors, who remain committed to our success. Finally, we appreciate the support of our shareholders, whose confidence has enabled us to pursue our mission. We look forward to the coming year with great enthusiasm.



P. Kay Wagoner, Ph.D.
President and Chief Executive Officer

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

Form 10-K
ANNUAL REPORT
PURSUANT TO SECTIONS 13 OR 15(d)
OF THE SECURITIES EXCHANGE ACT OF 1934

(Mark One)

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

For the fiscal year ended: December 31, 2006

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

For the transition period from to
Commission file number: 000-50676

Icagen, Inc.
(Exact name of registrant as specified in its charter)

Delaware	**56-1785001**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

4222 Emperor Boulevard, Suite 350
Durham, North Carolina 27703
(Address of principal executive offices, including zip code)

Registrant's telephone number, including area code: (919) 941-5206

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

Common Stock, $0.001 par value per share
(Title of class)

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act of 1933, or the Securities Act. Yes ☐ No ☒.

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

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

Indicate by check mark 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, or a non-accelerated filer. See definitions of "accelerated filer and large accelerated filer" in Rule 12b-2 of the Exchange Act. (Check One).

Large accelerated filer ☐ Accelerated filer ☒ Non-accelerated filer ☐

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

The aggregate market value of voting and non-voting common equity held by non-affiliates of the registrant, as of June 30, 2006, was approximately $95,297,665 based on the closing sale price of the common stock on such date as reported on the Nasdaq Global Market. For purposes of the immediately preceding sentence, the term "affiliate" consists of each director and executive officer of the registrant.

The number of shares of the registrant's common stock, $0.001 par value per share, outstanding on February 28, 2007 was 37,782,857.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement for its 2007 Annual Meeting of Stockholders scheduled to be held on June 26, 2007, or the 2007 Proxy Statement, which will be filed with the Securities and Exchange Commission, or SEC, not later than 120 days after December 31, 2006, are incorporated by reference into Part III of this Annual Report on Form 10-K. With the exception of the portions of the 2007 Proxy Statement expressly incorporated into this Annual Report on Form 10-K by reference, such document shall not be deemed filed as part of this Annual Report on Form 10-K.

Icagen and our logo are our trademarks. Each of the other trademarks, trade names or service marks appearing in this prospectus belongs to its respective holder.

ICAGEN, INC.

INDEX TO ANNUAL REPORT ON FORM 10-K
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2006

SPECIAL NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Annual Report on Form 10-K and the documents incorporated by reference in this Annual Report on Form 10-K contain forward-looking statements that involve substantial risks and uncertainties. In some cases you can identify these statements by forward-looking words such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "should," "will," and "would," or similar words. You should read statements that contain these words carefully because they discuss future expectations, contain projections of future results of operations or of financial position or state other "forward-looking" information. The important factors listed below, as well as any cautionary language elsewhere in this Annual Report on Form 10-K, provide examples of risks, uncertainties and events that may cause our actual results to differ materially from the expectations described in these forward-looking statements. You should be aware that the occurrence of the events described in the "Risk Factors" section below and elsewhere in this Annual Report on Form 10-K could have an adverse effect on our business, results of operations and financial position.

Any forward-looking statements in this Annual Report on Form 10-K are not guarantees of future performance, and actual results, developments and business decisions may differ from those envisaged by such forward-looking statements, possibly materially. We disclaim any duty to update any forward-looking statements.

PART I

ITEM 1—BUSINESS

Overview

We are a biopharmaceutical company focused on the discovery, development and commercialization of novel orally-administered small molecule drugs that modulate ion channel targets. Ions are charged particles, such as sodium, potassium, calcium and chloride. Ion channels are protein structures found in virtually every cell of the human body. Ion channels span the cell membrane and regulate the flow of ions into and out of cells. There are currently over 35 drugs marketed by third parties for multiple indications that modulate ion channels according to data from IMS Health. We believe this demonstrates that ion channels are attractive drug targets.

Utilizing our proprietary know-how and integrated scientific and drug development capabilities, we have identified multiple drug candidates that modulate ion channels. Our four most advanced programs are:

- senicapoc, previously referred to as ICA-17043, for sickle cell anemia and related genetic variants, which are referred to collectively as sickle cell disease. We initiated a pivotal Phase III clinical trial of senicapoc in the first quarter of 2005. In June 2004, we entered into collaboration and copromotion agreements with McNeil Pediatrics Division (formerly the McNeil Consumer & Specialty Pharmaceuticals Division) of McNeil-PPC, Inc., a subsidiary of Johnson & Johnson, relating to the development and commercialization of senicapoc;
- lead compounds for epilepsy and neuropathic pain, for which we are conducting preclinical studies;
- a compound for atrial fibrillation, for which our collaborator Bristol-Myers Squibb Company is conducting preclinical studies; and
- lead compounds for dementia, including Alzheimer's disease, for which our collaborator Astellas Pharma Inc., formerly Yamanouchi Pharmaceutical Co., Ltd., is conducting preclinical studies, and lead compounds for attention deficit/hyperactivity disorder, or ADHD, which were derived from the collaboration and for which we are conducting preclinical studies.

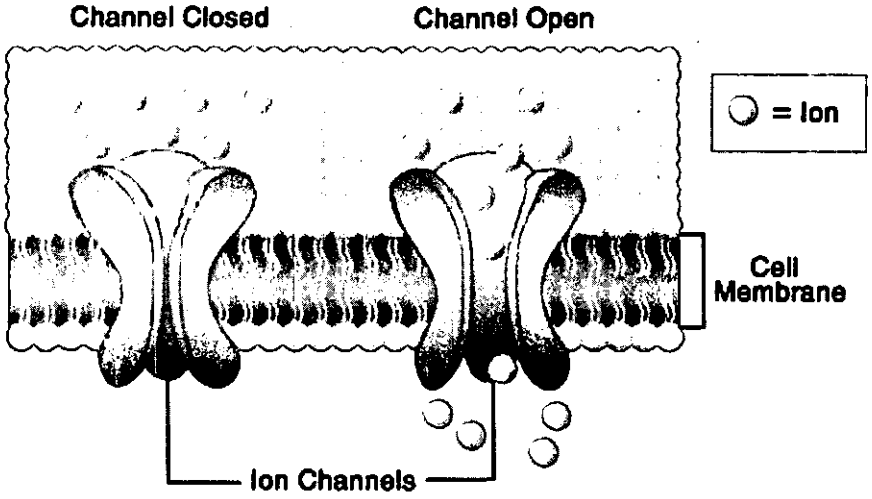
We are also conducting ongoing drug discovery programs focused on new therapeutics for pain and inflammatory disorders. In each of these programs, we have identified small molecule compounds that have

demonstrated activity on specific ion channels. When we tested these compounds in preclinical studies, including in some cases animal models, they showed desired activities and profiles, validating these ion channels as potential therapeutic targets for the particular indication. In addition to our internal programs, we have established collaborations with McNeil, Bristol-Myers Squibb and Astellas to further capitalize on our ion channel capabilities. We plan to generate revenue from any product candidates that we successfully develop either through direct sales, collaboration arrangements with leading pharmaceutical and biotechnology companies or a combination of these approaches.

Scientific Background

Ion Channels as Drug Targets

Ions generally cannot move freely across cell membranes, but must enter or exit a cell through pores created by ion channels. Ion channels open and close, or gate, in response to particular stimuli, including ions, other cellular factors, changes in electrical voltage or drugs.



The concentration of specific ions in particular cells in the body is critically important to many vital physiological functions. Consequently, ion channels play a key role in a wide variety of processes in the human body, which can be broadly grouped into three categories:

- *Electrical impulse generation and conduction* along nerves in the central and peripheral nervous system, the heart and other organs;
- *Signal transduction* within and among cells, including immune system cells that, when activated, trigger an inflammatory response; and
- *Fluid balance* within cells and across cell membranes, including fluid balance in red blood cells, cells in the eye and other cells throughout the body.

Small molecule compounds have been shown to both activate and inhibit ion channels. As a result, ion channels represent an important class of targets for pharmaceutical intervention in a broad range of disease areas. Examples of currently marketed drugs that exert their effects through ion channel modulation include:

- *calcium channel blockers*, such as Norvasc and verapamil, which are used for the treatment of hypertension and various other cardiovascular disorders;
- *sodium channel blockers*, such as Lamictal, which is used for the treatment of epilepsy, and lidocaine, a local anesthetic; and
- *potassium channel blockers*, such as Glipizide, which is used in the treatment of diabetes.

Despite the number of successful ion channel drugs on the market today, the majority of these drugs were developed without prior knowledge of their mechanism of action. Only recently have drug researchers identified and cloned a substantial number of ion channel genes, enabling integration of genetic information with the drug discovery process and allowing for a more methodical and scientific approach to the identification and selection of both the ion channel target and potential drug.

We believe that many pharmaceutical and biotechnology companies historically have avoided drug discovery programs targeting ion channels due to significant technical challenges and complexities associated with the structure and function of ion channels. Ion channel drug discovery is a complex endeavor that requires a comprehensive understanding of ion channel function. Ion channel drug discovery also requires specialized functional assays to characterize the interaction between a drug and an ion channel and determine the ability of a compound to modify the activity of an ion channel target, often across a range of physiologic conditions. Functional assays are difficult and time-consuming to develop, tend to be low throughput and require significant technical expertise. Ion channel drug discovery also requires expertise in electrophysiology to determine the effects of drugs on ion channel activity. Electrophysiology is the study of ion channel function and involves the measurement of the electrical current generated when ions flow through ion channel pores. For these reasons, we believe that the majority of the promising ion channel targets remain unexploited and that a significant opportunity exists for an integrated approach to ion channel drug discovery that can be applied across a wide spectrum of therapeutic areas.

Ion Channel Complexity

Ion channels are complex protein structures typically comprised of two or more subunits, or building blocks. These subunits associate to form a pore through which ions are able to pass when the channel is in the open state. Other subunits are important in determining whether an ion channel is gated open or closed or whether the specific ion channel is expressed in a specific cell, tissue or organ. Subunits are capable of associating with each other in multiple combinations, allowing for the number of ion channel drug targets to be substantially greater than the number of ion channel genes. We have identified and cloned over 300 human ion channel genes coding for these subunits.

Ion channels possess gating mechanisms which may cause the channel to undergo changes in shape or molecular arrangement, called conformational changes. These conformational changes may occur in response to particular stimuli, including ions, other cellular factors, and changes in electrical voltage or drugs. Conformational changes may expose additional sites on the channels that can be targeted for drug interactions. In studying the function of ion channels, it is important to understand the different channel conformational states so that potential drugs can be discovered and appropriately characterized.

Ion channels are classified into families based upon the type of ion or ions that pass through the channel and the gating mechanism. Within a given family, ion channels share similarities in structure and functional properties, facilitating the study of multiple channels within a family. Across different ion channel families, there may also be similarities in structure and functional properties, although to a lesser degree than within the same family. Despite the potential similarities, there are key areas on ion channels that allow for potent and selective drug interactions.

A comprehensive knowledge base that spans multiple ion channels and ion channel families enhances ion channel drug discovery because it enables identification of similarities and differences among ion channels. Similarities among channels are important because they can lead to the identification of related chemical structures that have activity against many related ion channels. These related chemical structures can then be modified to provide for the desired specificity against a particular ion channel target. Similarities among ion channels are also important because they can lead to side effects if a small molecule modulator is not appropriately targeted. Differences among ion channels are important because they provide the opportunity to develop specific, targeted therapies.

Our Approach to Ion Channel Drug Discovery and Development

Over the past decade, we have established an interdisciplinary environment that is designed to meet the challenges and complexities faced in ion channel drug discovery. Our capabilities include molecular biology and the use of complex functional assays, electrophysiology, medicinal and computational chemistry, bioanalytics, pharmacology and clinical development. We believe that this integrated set of capabilities enhances our ability to develop drug candidates that modulate ion channels for the treatment of a range of diseases with significant unmet medical need and commercial opportunity.

We utilize a target class approach to drug discovery. Whereas traditional drug discovery starts with the disease and seeks to identify potential intervention points, or drug targets, our target class approach starts with all potential ion channel targets and seeks to identify applications to the treatment of various diseases. We believe that our understanding of the ion channel genome and ability to apply this knowledge in a target class approach to drug discovery facilitates our identification of small molecule drug candidates with novel mechanisms of action and enhanced selectivity and specificity profiles. Moreover, because our drug discovery and development process screens for potential side effects at an earlier stage than some alternative approaches, we believe that this process enables us to identify small molecule drug candidates that may have a reduced risk of clinical failure and may shorten clinical development timelines.

Complementary to our target class approach is our expertise across the therapeutic areas that are the focus of our current research efforts. Not only do we have a deep understanding of the functional activity of our ion channel targets, but we also understand the role that these targets play in the relevant physiologic system. For example, much of our current research efforts are focused on disorders of the central and peripheral nervous system. To understand the role of ion channels in these systems and in the disease areas of interest to us, we have developed the capability to study our targets in a variety of *in vitro* and *in vivo* models. These models include cell-based assays, tissue-based assays, and complex animal models of seizure, memory and pain disorders. We combine our expertise in ion channel targets with our capabilities in systems-based biology and understanding of physiologic systems to identify attractive opportunities for therapeutic intervention.

Using our drug discovery and development approach, we have:

- developed one clinical stage program and three preclinical stage programs with what we believe are novel chemical entities working through novel mechanisms of action;
- established ongoing collaborations with three leading pharmaceutical companies; and
- developed ongoing research stage programs spanning multiple and diverse therapeutic areas and providing us with a pipeline of compounds that modulate ion channel targets.

Our Strategy

Our goal is to become a fully-integrated biopharmaceutical company and a leader in the discovery, development and commercialization of novel small molecule drugs that modulate ion channel targets and address disease areas with significant unmet medical need and commercial potential. We intend to achieve this goal through the execution of our strategy, key elements of which are as follows:

Maximize the commercial potential of senicapoc. We are focusing a significant portion of our business efforts on completing clinical trials of senicapoc for the treatment of sickle cell disease. We initiated a pivotal Phase III clinical trial of this drug candidate in the first quarter of 2005. If we are successful in developing and obtaining regulatory approval for the marketing of this product, we and McNeil have agreed to copromote senicapoc in the United States and share equally in the profits and losses from the commercialization of senicapoc in the United States and, if we elect to copromote in Canada, from the commercialization of senicapoc in Canada. McNeil is entitled to commercialize senicapoc outside the United States, including in Canada if we do not elect to copromote in that country, pursuant to an exclusive license and is required to pay us a royalty on net product sales.

Build and advance our product candidate pipeline. Through our ion channel drug discovery and development programs, we have created a pipeline of drug candidates that address diseases with significant unmet medical need and commercial potential across a range of therapeutic areas. We plan to aggressively pursue the development and commercialization of these drug candidates, including the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain. We believe that the breadth of our capabilities in ion channel drug discovery technology will enable us to continue to identify and develop additional drug candidates on an efficient and rapid basis. In addition to developing drug candidates internally, we continue to evaluate opportunities to in-license promising compounds and technologies.

Strengthen and expand our core ion channel drug discovery technologies and development capabilities. All of our drug candidates and research programs have resulted from our core ion channel drug discovery technologies. We have steadily built these technologies, which span the key disciplines of biology, chemistry and pharmacology, over a number of years. We intend to continue to invest in these core technologies, including our ion channel focused compound library, as the key to our future research programs and drug candidates. We also plan to augment our existing development team by adding personnel with experience in drug safety, regulatory affairs, statistical methods, project management and medical affairs.

Establish strategic alliances with leading pharmaceutical and biotechnology companies. We plan to selectively enter into new strategic alliances with leading pharmaceutical and biotechnology companies to assist us in advancing our drug discovery and development programs. We expect that these alliances will provide us with access to the therapeutic area expertise and research, development and commercialization resources of our collaborators as well as augment our financial resources. We believe that our expertise in ion channel drug discovery and development helps us to secure collaborations, such as our current collaborations with McNeil, Bristol-Myers Squibb and Astellas, on attractive terms. We expect that in some of these alliances we will seek to maintain rights in the development of drug candidates and the commercialization of drugs as part of our effort to build our internal clinical development and sales and marketing capabilities.

Establish specialized sales and marketing capabilities. We plan to retain United States marketing and sales rights or copromotion rights for our product candidates for which we receive marketing approvals in situations in which we believe it is possible to access the market through a focused, specialized sales force. For example, for senicapoc we believe that the community of hematologists who are the key specialists in treating sickle cell disease, and the medical facilities in which they practice, are sufficiently concentrated to enable us to effectively copromote to this market together with McNeil with a small internal sales force. For situations in which a large sales force is required to access the market and with respect to markets outside of the United States, we generally plan to commercialize our drug candidates through a variety of types of collaboration arrangements with leading pharmaceutical and biotechnology companies.

Clinical and Preclinical Programs

The following table summarizes key information about our and our collaborators' product candidates that are in clinical trials and our principal preclinical programs. All of the compounds in these programs are the result of our internal or collaborative research efforts. In all of these programs, we or our collaborators are developing small molecule drugs that target specific ion channels.

Product Candidate/Indication	Development Phase	Commercialization Rights	Status
Clinical Programs			
Senicapoc for sickle cell disease	Phase III	Icagen and McNeil	Pivotal Phase III clinical trial initiated in the first quarter of 2005
Preclinical Programs			
Lead compounds for epilepsy and neuropathic pain	Preclinical	Icagen	Preclinical studies in progress
Lead compound for atrial fibrillation	Preclinical	Bristol-Myers Squibb	Preclinical studies in progress
Lead compounds for dementia, including Alzheimer's disease, and ADHD	Preclinical	Astellas and Icagen	Preclinical studies in progress

Senicapoc for Sickle Cell Disease

Our most advanced drug candidate, senicapoc, is a novel small molecule ion channel inhibitor that targets a particular potassium channel, called the Gardos channel, that is located on the membrane of red blood cells. We are developing senicapoc for the chronic prophylactic treatment of sickle cell disease. Senicapoc is taken orally and is being developed for once-a-day dosing. Senicapoc has received fast track designation and orphan drug designation from the U.S. Food and Drug Administration, or FDA. Fast track designation may allow for expedited review by the FDA and is granted to those proposed products that the FDA believes address life threatening conditions and that demonstrate the potential to address unmet medical needs. Orphan drug designation would preclude the FDA, subject to some exceptions, from approving another application to market the same drug for the same indication for seven years if senicapoc is the first drug that the FDA approves for this indication in the United States. We have retained the right to copromote and share equally in profits from the commercialization of senicapoc together with McNeil in the United States and, at our option, Canada.

Disease overview. Sickle cell disease is a chronic and debilitating genetic blood disorder, primarily affecting individuals of African descent, resulting in a variety of disease complications and a significantly shortened lifespan in the majority of patients. The genetic defect in sickle cell disease is a single point mutation in the DNA sequence coding for hemoglobin, the oxygen-carrying protein found in red blood cells. This genetic defect predisposes the hemoglobin molecules to polymerize into long chain-like structures under particular conditions, creating abnormal red blood cells. These abnormal red blood cells lose potassium ions along with chloride ions and water. These processes lead to the formation of dense and dehydrated red blood cells that may assume a characteristic "sickle" shape. There are also a variety of other abnormalities that occur in sickle cell disease, including damage to the red blood cell membrane, increased viscosity of the blood and abnormalities of blood vessels, which contribute to the disease.

One of the key pathways by which dehydration of red blood cells occurs in patients with sickle cell disease involves the Gardos ion channel. Although this channel is normally closed, in patients with sickle cell disease, the Gardos channel is open in some circumstances. The opening of the Gardos channel allows the outward flow of potassium ions from the cell, which is followed by an outward flow of chloride ions and water, contributing to the dehydration of the red blood cell. This dehydration contributes to an increase in the rate of polymerization of hemoglobin, leading to the formation of dense and, ultimately, sickled cells.

There are several clinical manifestations of sickle cell disease, including chronic anemia, the effects of chronic hemolysis, vaso-occlusive crises and chronic organ damage.

- *Chronic Anemia.* The premature removal of abnormal red blood cells from the circulation of sickle cell disease patients results in anemia. Anemia is a condition in which there is a reduction in the level of hemoglobin or the number of red blood cells in the bloodstream, resulting in insufficient delivery of oxygen to cells, tissues and organs. The average lifespan of red blood cells in normal individuals is approximately 120 days, compared to 10 to 20 days in sickle cell disease patients. This shortened red blood cell lifespan results from the changes in shape, elasticity and cellular membrane integrity that occur in these patients. Symptoms that can result from this chronic anemia include reduced exercise tolerance, fatigue, shortness of breath and growth retardation.

  In addition, chronic anemia is believed to lead to long-term complications that contribute to the difficult clinical course experienced by many patients. In particular, since each unit of blood in a sickle cell patient delivers less oxygen than in a normal person, chronic anemia places abnormal stress on the heart to pump more blood through the body. Over a period of years, this added stress on the heart can lead to heart failure. In addition, if the anemia is sufficiently severe, oxygen delivery to vital cells, tissues and organs can be compromised, a condition called chronic hypoxia. Chronic hypoxia causes a generalized impairment of growth and development as well as damage to multiple organs.

- *Chronic Hemolysis.* Sickle cell disease results in the premature removal from the circulation and destruction of abnormal red blood cells, a process known as hemolysis. Hemolysis results in the release of particular substances into the bloodstream, including bilirubin, which is a breakdown product of hemoglobin, and, to a lesser extent, hemoglobin that is not contained within red blood cells, or free hemoglobin. Elevated levels of bilirubin in the circulation can cause jaundice, which results in a yellow discoloration of the skin and the white portion of the eyes, and lead to the formation of gall stones, which can result in disease of the gall bladder requiring surgical intervention. Elevated levels of free hemoglobin in the circulation have been associated with elevations in blood pressure, pulmonary hypertension, a frequent and potentially lethal complication in patients with sickle cell disease, and other abnormalities of the blood vessels.

- *Vaso-occlusive Crises.* Vaso-occlusive crisis is the most well known clinical manifestation of sickle cell disease. Vaso-occlusive crisis is the result of a localized obstruction of blood flow. Obstruction of blood flow deprives cells, tissues and organs downstream of oxygen and vital nutrients. Vaso-occlusive crises result in severe pain, which often requires hospitalization, typically for several days. Acute treatment usually consists of intravenous hydration, supplemental oxygen and pain management. Vaso-occlusive crises most often affect the bones and muscles. Less frequently, but more dangerously, vaso-occlusive crises can affect vital organs, such as the lungs, brain, heart and kidneys. Multiple sickle cell crises are believed to be the primary cause of the organ system damage and significantly shortened lifespan typically seen in patients with sickle cell disease. Although the cause of vaso-occlusive crises has not been clearly established, factors that are believed to contribute to these episodes include dense and sickled red blood cells, abnormalities of the red blood cell membrane, increased viscosity of the blood and changes that occur in the blood vessels.

- *Chronic Organ Damage and Other Disease Complications.* Patients with sickle cell disease suffer from chronic organ damage. Since the basic defect associated with the disease involves the circulatory system, and because the circulatory system supplies all tissues and organs with oxygen and vital nutrients, the disease can result in damage to virtually any organ system. Vital organs that are most often affected by the disease include the lungs, kidneys, spleen and heart. Other common disease complications include damage to the bones and joints, chronic leg ulcers and increased susceptibility to infections.

Market opportunity and current treatment. Sickle cell disease is the most common genetic disease among individuals of African descent and is prevalent worldwide according to information on the Washington University Physicians website. According to market research conducted on our behalf, there are approximately 120,000 patients with sickle cell disease in the United States. In the United States, sickle cell disease affects approximately one in every 500 African-American births and one in every 1,000 to 1,400 Hispanic-American births according to the National Institutes of Health. Approximately 1,000 children are born with sickle cell disease in the United States each year according to the Sickle Cell Disease Association of America. Screening programs have been established in most states to ensure that a child born with sickle cell disease receives prompt medical attention and parents receive counseling on caring for their child according to the Georgia Comprehensive Sickle Cell Center at Grady Health System.

Treatment options for patients with sickle cell disease are currently extremely limited. For patients with particularly severe disease, hydroxyurea, a cancer chemotherapeutic agent, is used on a chronic basis to reduce the incidence of vaso-occlusive crises. The mechanism of action of hydroxyurea is believed to include an increase in the production of a form of hemoglobin that is normally found in fetal life and that does not contain the sickle cell disease-causing genetic mutation. Although hydroxyurea has been shown to be effective in the treatment of some patients, many patients continue to have frequent vaso-occlusive crises even while on hydroxyurea therapy. Hydroxyurea is also associated with several potentially serious side effects, including suppression of the bone marrow and the immune system. As a result, physicians generally prescribe hydroxyurea only for those patients with frequent vaso-occlusive crises. While the use of hydroxyurea has historically been limited as a result of these side effects, its use has increased due to increasing patient and physician acceptance of the benefits of hydroxyurea therapy. Nevertheless, there is a need for additional therapeutic agents which may be used either in combination with hydroxyurea or as monotherapy. Physicians may also consider the use of blood transfusions in some situations, either on an acute or a chronic basis. However, there are significant risks associated with frequent transfusions, including iron-overload, the transmission of blood-borne diseases and the development of antibodies to the transfused blood, all of which are potentially lethal. Physicians may consider bone marrow transplantation to treat sickle cell disease patients in select cases in which a suitable donor is available, but this treatment option carries a significant risk of morbidity or mortality.

Senicapoc

We are developing senicapoc, which is an inhibitor of the Gardos channel, for the chronic treatment of sickle cell disease. We have evaluated senicapoc in multiple preclinical and clinical studies.

Preclinical Results. In preclinical studies, including *in vitro* assays using human red blood cells and in a mouse model of sickle cell anemia, senicapoc:

- blocked the Gardos channel in a selective and specific manner;
- prevented the outward flow of potassium ions through the Gardos channel, thereby significantly reducing the loss of potassium ions, which in turn reduced the loss of chloride ions and water from red blood cells;
- significantly reduced the formation of dense cells; and
- demonstrated an acceptable safety and toxicity profile.

Phase I Trials. We conducted a Phase I clinical trial program for senicapoc that involved a total of over 200 study participants, including both healthy volunteers and sickle cell disease patients. In addition, we are currently conducting a pediatric pharmacokinetic, safety and pharmacodynamic Phase I study in 28 pediatric sickle cell disease patients. The Phase I program was designed to study senicapoc with regard to safety, dose, pharmacokinetics, metabolism, bioavailability, interaction with oral contraceptives and Gardos channel inhibition. Pharmacokinetics refers to the absorption into, distribution within and excretion from the body of a drug. Pharmacodynamics refers to the effect of a drug upon measurable physiologic parameters. We conducted seven separate Phase I studies, including single-dose escalation studies in both patients and healthy volunteers, as well as multiple dose, food effect, bioavailability, drug metabolism and drug interaction studies in healthy

volunteers. In blood samples taken from both healthy volunteers and patients, senicapoc achieved dose-dependent Gardos channel inhibition. Senicapoc demonstrated pharmacokinetic properties suitable for chronic therapy. The half-life of senicapoc in these trials was approximately 12 to 14 days. The drug was shown to have a favorable safety profile, with no drug-related serious adverse events. There was, however, a mild increase in the activity of a liver enzyme that is responsible for the metabolism of some other drugs. A mild increase in this enzyme could decrease somewhat the blood levels of other drugs, such as some contraceptives, erythromycin-type antibiotics and some cholesterol lowering drugs, when taken concurrently with senicapoc. A similar, but more marked, effect is seen in other currently marketed drugs, and we do not consider this finding to be a concern with regard to the further development of senicapoc. However, no assessment of the efficacy or safety of a product candidate can be considered definitive until all clinical trials needed to support a submission for marketing approval are complete. Success in earlier clinical trials does not mean that subsequent trials will confirm the earlier findings.

Phase II Trial. In 2004, we completed a randomized, double-blind, placebo-controlled dose-range-finding Phase II clinical trial of the efficacy and safety of senicapoc in 90 patients with sickle cell anemia. The study was conducted at 19 academic medical centers across the United States. Male and female patients, 18 to 60 years of age, with a confirmed diagnosis of sickle cell anemia and a history of at least one vaso-occlusive crisis requiring hospitalization in the past were eligible for the study.

The study was comprised of three arms, consisting of approximately 30 patients each:

- a 10 mg treatment arm, in which patients received a single 150 mg loading dose followed by a 10 mg daily dose;
- a 6 mg treatment arm, in which patients received a single 100 mg loading dose followed by a 6 mg daily dose; and
- a placebo arm.

In each arm of the study, eight of the approximately 30 patients were also receiving hydroxyurea therapy.

Efficacy assessments included changes in hemoglobin level, which was the primary study endpoint, red blood cell count, hematocrit, reticulocytes, dense red blood cells and two biochemical markers of hemolysis, bilirubin and lactate dehydrogenase, or LDH. Clinical assessments included rates of painful crises, time to painful crisis, chronic pain intensity score, maximum crisis morbidity rank and quality of life as measured by the SF-36 health status survey. We included these clinical parameters to help us assess the feasibility and logistics of these endpoints for use in our planned Phase III trial. However, this study was not powered to demonstrate statistical significance with respect to these clinical parameters. We also determined plasma concentrations of senicapoc and hydroxyurea and Gardos channel inhibition.

Our analyses of hemoglobin and other laboratory parameters compared baseline values with values measured at the end of the study period in each of the two active treatment arms and in the placebo arm. The efficacy assessments at the end of the study period were the average of the values measured at weeks 10 and 12, the last two weeks of the treatment period of the study. For the analysis, we used the placebo adjusted difference, which is the difference between the effect measured in the relevant active treatment arm and the effect measured in the placebo arm. In connection with our analysis of the data, we determined statistical significance based on a widely used, conventional statistical method that establishes the p-value of clinical results. A p-value indicates the likelihood that the measured result was obtained purely by chance. Under this method, a p-value of 0.05 or less is considered to indicate statistical significance.

We performed analyses on both an intent-to-treat basis and a per-protocol basis. The intent-to-treat analysis was based on the 88 patients from whom we collected any efficacy data with respect to the effect of treatment with senicapoc. The per-protocol analysis was based on the 70 patients who completed the study and who took at least 80% of the study medication as determined by investigator pill count. The results from our analyses of efficacy assessments were similar between the intent-to-treat and per-protocol populations. We have presented

data on our primary efficacy endpoint using the results of data from both the intent-to-treat and the per-protocol populations. All other data uses the results of data from only the intent-to-treat population.

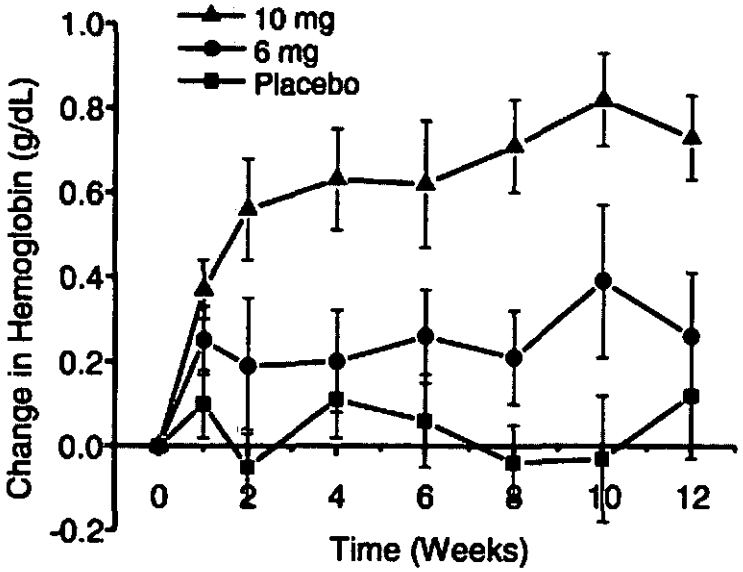
The findings presented below with respect to hemoglobin and other laboratory parameters were dose-dependent. We have focused on describing the results obtained in the 10 mg treatment arm because patients in this arm obtained levels of senicapoc in the bloodstream that achieved near-complete Gardos channel inhibition and that we believe provide optimal therapeutic benefit. Our Phase III clinical trial calls for dosing study patients with a 10 mg daily dose of senicapoc following an initial loading dose of 160 mg administered over a four-day period. The results described below with regard to hemoglobin and other laboratory parameters were generally similar within treatment arms across patients who were both on and off hydroxyurea therapy. We believe that this finding suggests that senicapoc may have benefits both as a standalone therapy and when used in combination with hydroxyurea.

Primary Efficacy Endpoint

The primary endpoint was change in hemoglobin level. Hemoglobin level is a measure of the amount of hemoglobin per unit volume of blood and provides a measure of the ability of blood to transport oxygen to the tissues. Hemoglobin level is commonly used in clinical practice to assess the severity of anemic disorders and is one of the factors considered by physicians in determining whether to prescribe treatment, such as a blood transfusion, to patients with anemia, including sickle cell anemia. Senicapoc demonstrated a dose-dependent and, in the 10 mg treatment arm, statistically significant increase in hemoglobin level as compared to the placebo arm.

The time course for the mean changes in hemoglobin from baseline for the three treatment arms is depicted in the following chart. The maximal change in hemoglobin was not seen until near the end of the 12-week treatment period in the 10 mg arm. Grams per deciliter (g/dL) is a commonly accepted laboratory measurement of hemoglobin level. The vertical bars at each point on the chart indicate the degree of variability, as measured by standard error, a commonly used statistical parameter, in the measurements of hemoglobin level associated with each point.

Mean Changes in Hemoglobin From Baseline During 12 Week Treatment Period Intent-to-Treat Population



The following tables set forth an analysis of hemoglobin changes on an intent-to-treat and per-protocol basis in patients in the 10 mg treatment arm divided into three groups: (1) all patients; (2) patients receiving senicapoc with hydroxyurea; and (3) patients receiving senicapoc without hydroxyurea. The magnitude of the hemoglobin

change was similar in all three groups for both analyses, with median changes somewhat higher, in general, than mean changes. The mean changes in both the group of all patients and the group of patients receiving senicapoc without hydroxyurea were statistically significant. We did not test statistical significance in the group of patients receiving senicapoc with hydroxyurea because of the small sample size. Increasing values are indicated with an upwards arrow.

Placebo Adjusted Difference in Hemoglobin Level in the 10 mg Treatment Arm (g/dL)

	Intent-to-Treat Population					
Group	Sample Size	Mean Baseline	Mean Difference	% Difference	Mean P-Value	Median Difference
All patients	31	7.97	↑ 0.67	↑ 8	<0.001	↑ 0.85
Patients receiving senicapoc with hydroxyurea	8	8.40	↑ 0.77	↑ 9	*	↑ 0.90
Patients receiving senicapoc without hydroxyurea	23	7.82	↑ 0.63	↑ 8	0.004	↑ 0.75
	Per-Protocol Population					
Group	Sample Size	Mean Baseline	Mean Difference	% Difference	Mean P-Value	Median Difference
All patients	25	7.93	↑ 0.75	↑ 9	<0.001	↑ 0.83
Patients receiving senicapoc with hydroxyurea	4	8.64	↑ 0.67	↑ 8	*	↑ 0.90
Patients receiving senicapoc without hydroxyurea	21	7.79	↑ 0.84	↑ 11	<0.001	↑ 1.00

* Due to the small sample size, we did not test these results for statistical significance.

For purposes of comparison, an increase in hemoglobin level of approximately 1.0 g/dL is generally consistent with the hemoglobin change resulting from the transfusion of one unit of blood. Based upon this metric, we believe that the increase in hemoglobin level seen in patients in the 10 mg treatment arm was clinically meaningful. We further believe that this increase in hemoglobin level is consistent with the predicted activity of senicapoc to decrease hemolysis and thereby improve anemia.

Secondary Efficacy Endpoints

We also measured other laboratory parameters as secondary efficacy endpoints to further evaluate the effect of senicapoc upon hemolytic anemia. The following table sets forth the placebo-adjusted results for patients in the 10 mg treatment arm. With respect to each of these parameters, senicapoc demonstrated a dose-dependent and, in the 10 mg treatment arm, statistically significant effect as compared to the placebo arm. With regard to most of these measurements, these effects were also statistically significant in the 6 mg treatment arm. In making each of these measurements, we applied the laboratory units commonly employed in measuring these parameters. Decreasing values are indicated with a downwards arrow; increasing values are indicated with an upwards arrow.

Placebo Adjusted Difference in the 10 mg Treatment Arm

Parameter (units)	Intent-to-Treat Population				
	Mean Baseline(1)	Mean Difference	% Difference	Mean P-Value	Median Difference
Red blood cell count (10^6/μL)	2.56	↑ 0.31	↑ 12	<0.001	↑ 0.28
Hematocrit (%)	24.65	↑ 1.89	↑ 8	0.002	↑ 2.60
Reticulocytes (10^6/μL)	0.34	↓ 0.06	↓ 18	<0.001	↓ 0.03
Dense red blood cells (10^6/μ/L)	0.18	↓ 0.04	↓ 22	0.008	↓ 0.05
Indirect Bilirubin (mg/dL)	2.94	↓ 1.30	↓ 43	<0.001	↓ 0.85
LDH (u/L)	509	↓ 106	↓ 21	0.002	↓ 142

(1) Baseline levels in the placebo arm were similar to those in the 10 mg treatment arm.

- ***Red blood cell count and hematocrit***. Red blood cell count and hematocrit, similar to hemoglobin level, are measures of the number of red blood cells and oxygen-carrying capacity of the blood. Red blood cell count and hematocrit are decreased in sickle cell anemia as a result of destruction of the abnormal red blood cells. Improvement in the hemolytic anemia would be expected to result in an increase in red blood cell count and hematocrit. We observed a 12% increase in red blood cell count and an 8% increase in hematocrit in the 10 mg treatment arm relative to the placebo arm.
- ***Reticulocytes***. Reticulocytes are immature red blood cells that are released from the marrow into the circulation. A high level of reticulocytes is seen in sickle cell anemia as the bone marrow attempts to compensate for red blood cell destruction by increasing production of new red blood cells. Improvement in the hemolytic anemia would be expected to result in a decrease in reticulocytes. We observed an 18% reduction in reticulocytes in the 10 mg treatment arm relative to the placebo arm.
- ***Dense red blood cells***. Dense red blood cells are those red blood cells that have become dehydrated and are believed to result in the formation of sickle cells. We observed a 22% reduction in the formation of dense red blood cells in the 10 mg treatment arm relative to the placebo arm.
- ***Indirect bilirubin and LDH***. Indirect bilirubin and LDH are biochemical markers of red blood cell destruction and are elevated in sickle cell anemia as a result of premature destruction of the abnormal red blood cells. Improvement in the hemolytic anemia would therefore be expected to result in a decrease in indirect bilirubin and LDH. We observed a 43% reduction in indirect bilirubin and a 21% reduction in LDH in the 10 mg treatment arm relative to the placebo arm.

We believe that these results collectively are consistent with the predicted activity of senicapoc to decrease hemolysis and thereby improve anemia.

Clinical Endpoints

This Phase II clinical trial was designed to determine whether senicapoc decreased hemolysis and improved anemia; it was not designed or powered to detect changes in clinical endpoints such as vaso-occlusive crisis rate. Such an event-based study requires a larger trial size, a longer treatment period and enrollment of patients who have a history of more vaso-occlusive crises than those enrolled in our Phase II clinical trial. However, to gain experience for our Phase III clinical trial of senicapoc, we measured a selected number of clinical endpoints in our Phase II clinical trial, including vaso-occlusive crisis rate and time to first crisis. Patients enrolled in our Phase II clinical trial historically had a relatively low frequency of vaso-occlusive crises, with only 44 patients, or approximately half of the intent-to-treat group, reporting a history of two or more vaso-occlusive crises during the one year period prior to enrollment. We did not observe a significant difference across treatment arms with regard to vaso-occlusive crisis rate. In all arms, median time to first crisis was greater than the 12-week treatment period.

We subsequently performed a post-hoc subgroup analysis on the 44 patients with a history of two or more vaso-occlusive crises in the year prior to enrollment. We analyzed this subgroup because we expected to enroll

patients who meet this criterion in our planned Phase III clinical trial. We intended to enroll such patients because we believe that patients with a history of more frequent vaso-occlusive crises will be required to identify a difference, if one is present, between senicapoc and placebo with regard to vaso-occlusive crisis rate. In the post-hoc analysis that we performed with respect to this small subgroup of patients in our Phase II clinical trial, we used both raw crisis rates and crisis rates that were adjusted according to a commonly accepted statistical technique to account for the effect of a few significant outliers. In both the raw and adjusted data analyses, we observed a lower vaso-occlusive crisis rate in both the 10 mg and the 6 mg treatment arms relative to the placebo arm. Because of the small sample size, we did not test these results for statistical significance.

Other clinical endpoints in the Phase II clinical trial that we measured included chronic pain intensity score, maximum crisis morbidity rank, which is a measure of crisis seriousness, and quality of life as measured by the SF-36 health status survey. The level of pain among patients in this study was low, averaging slightly greater than 2.0 on a 0 to 10.0 point scale. We did not identify a statistically significant difference among treatment groups with regard to chronic pain intensity or maximum crisis morbidity rank. The SF-36 survey contains two summary measures, a physical well-being component and a mental well-being component. In the physical well-being component of the SF-36 survey, we noted a small but statistically significant change (p=0.007) favoring placebo over the 10 mg treatment arm but not the 6 mg treatment arm. We did not observe any significant differences across treatment arms in the corresponding mental well-being component of the SF-36 survey.

Safety and Tolerability

Senicapoc was well tolerated in both of the active treatment arms. There were no serious adverse events that were attributed to senicapoc. The only adverse events that were dose-related and occurred more frequently in the active treatment arms than in the placebo arm were diarrhea and nausea. No patients elected to discontinue treatment with senicapoc prematurely as a result of these events.

Notwithstanding the results of our Phase II clinical trial, no assessment of the efficacy or safety of senicapoc or any product candidate can be considered definitive until all clinical trials needed to support a submission for marketing approval are complete. Moreover, the primary clinical endpoint of our planned Phase III clinical trial of senicapoc is not the same as the primary clinical endpoint of our Phase II clinical trial of this product candidate. Success in preclinical studies or completed clinical trials does not mean that subsequent clinical trials will be successful.

Open Label Extension Study. In the second half of 2005, we completed an open label extension study to evaluate further the long-term safety and efficacy of senicapoc for a period of up to an additional 48 weeks beyond the Phase II study period. Following completion of the 12-week treatment period of the Phase II trial, and, for some patients, an eight-week washout period, patients were offered the opportunity to enroll in the open label extension study, provided the study site had previously obtained institutional review board approval for such extension study. Of the 56 patients eligible to enroll in the open label extension study, 44, or 79%, elected to do so.

The open label extension study provided for a daily dose of 10 mg of senicapoc for a period of up to 48 weeks beyond completion of the Phase II clinical trial. All patients in the open label extension study received active study medication. In addition, some patients remained on concomitant hydroxyurea therapy, provided they had been on hydroxyurea therapy prior to entering the Phase II trial. Unlike the Phase II trial, the open label extension study did not provide for an initial loading dose. The study was conducted primarily to evaluate further the long-term safety, and secondarily to evaluate descriptive evidence of efficacy, of this novel potential therapy. Since the study had no concurrent placebo control group, no formal statistical tests were performed.

Senicapoc was generally well tolerated during this open label extension study. There were no serious adverse events that were attributed to senicapoc. Of the 44 patients who enrolled in this study, 32 completed the 48-week treatment period, with only two patients discontinuing participation in the study as a result of adverse

events that were considered possibly or probably related to study medication, one following a reversible increase in the level of gamma glutamyl transferase, or GGT, an enzyme associated with the liver and biliary tract, and another following a diagnosis of interstitial nephritis. The only adverse events that occurred in two or more patients considered possibly related to study medication were GGT elevation, rash and headache.

During the Phase II trial, senicapoc was demonstrated to improve the hematologic profile in patients with sickle cell anemia. In the open label extension study, hematologic data was collected during treatment for 42 of the 44 patients. Since no placebo group was available during this study for comparison, the last hematologic values collected while patients were taking senicapoc during the open label study were compared to the beginning of Phase II trial baseline values. Analysis of these hematologic parameters suggested that the pattern of beneficial effects of senicapoc observed during the Phase II trial were maintained during the open label study. These effects included an increase in hemoglobin, hematocrit and red blood cell count, as well as a decrease in dense cells, reticulocytes, bilirubin and LDH.

Because there was no concurrent placebo control arm, there was no comparison group available in the open label extension study to appropriately assess the effect of senicapoc on vaso-occlusive crisis rates or average monthly pain intensity scores. Moreover, more than half of the patients in the open label extension study had a history of no crises or only one crisis in the year prior to the Phase II trial, making it difficult to detect improvements in crisis rate in these patients. Accordingly, a descriptive analysis was performed for the 44 enrolled patients comparing the number of crises observed during the treatment phase of the open label extension study, as defined by the study protocol, to the number of crises during the year prior to enrollment in the Phase II trial, as reported by patient recall. In this analysis, the historical number of crises in the one-year period prior to the Phase II trial was adjusted to account for the missing time on treatment in the open label extension study for those patients who dropped out of the open label extension study before its completion as well as for the difference in the length of the measurement period between the 48-week treatment period of the open label extension study and the one-year period of the historical data. Under this analysis, there were fewer crises during the open label extension study in comparison to the historical number of crises, especially in those patients with a history of two or more crises in the year prior to the Phase II trial. Given that crises in this study were not adjudicated by an independent committee as was done in the Phase II trial, and that there were a small number of self-selected patients, these descriptive results must be interpreted with caution. Average monthly pain intensity scores were relatively stable throughout the duration of the study.

Phase III Trial. As currently designed, our pivotal Phase III clinical trial of senicapoc for the chronic treatment of sickle cell disease is a randomized, double-blind, placebo-controlled study in 200 patients. Eligibility criteria for the trial includes a diagnosis of sickle cell disease, age between 16 and 65, a history of at least two vaso-occlusive crises requiring a visit to a medical facility in the year prior to enrollment and treatment with hydroxyurea for at least one year, including a stable dose for at least three months, prior to enrollment. Under the study protocol, patients are to be treated for a period of one year. The protocol provides for patients to be randomized into one of two arms, consisting of approximately 100 patients each:

- a senicapoc treatment arm, in which patients receive a loading dose of 160 mg administered over a four-day period followed by a 10 mg daily dose; or
- a placebo arm.

The primary endpoint for this study is vaso-occlusive crisis rate in the senicapoc arm versus vaso-occlusive crisis rate in the placebo arm. We chose vaso-occlusive crisis rate as our primary endpoint based upon two primary considerations. First, vaso-occlusive crises are believed to be the primary factor contributing to the significant morbidity and mortality associated with sickle cell disease. In addition, a reduction in vaso-occlusive crisis rate was the primary basis for the approval by the FDA of hydroxyurea, the only drug currently approved for the treatment of this disease. We also intend to evaluate a number of other endpoints, including many of those, such as hemoglobin level, analyzed in our Phase II clinical trial.

As initially designed, our Phase III trial had been intended to enroll 300 patients, including patients not on background hydroxyurea therapy as well as up to 150 patients on background hydroxyurea therapy, and had allowed for equal distribution of patients taking hydroxyurea between the senicapoc and placebo arms. However, during August 2006 following a planned interim analysis of safety, efficacy and futility by an independent Data Monitoring Committee, or DMC, of our Phase III trial of senicapoc, the DMC recommended that enrollment continue only for patients on background hydroxyurea therapy. For currently enrolled patients not on hydroxyurea, the DMC recommended that the study drug be discontinued and that patients proceed to the end of study follow-up period. The DMC noted further that there were no specific safety issues identified. The DMC subsequently conducted a follow-up review of updated data on patients on background hydroxyurea therapy and did not recommend any further changes to the protocol. Following this recommendation by the DMC, we retrospectively reviewed the crisis data from our Phase II study in patients with a history of two or more crises in the year prior to enrollment. As previously noted, in both the raw and adjusted data analyses, we observed a lower vaso-occlusive crisis rate in both the 10 mg and the 6 mg treatment arms relative to the placebo arm. This trend towards a reduction in crisis rate appeared most apparent in the eight patients who entered the study on a stable dose of hydroxyurea, received senicapoc and achieved a plasma concentration of approximately 80 ng/ml or greater, as compared to the five patients who entered the study on a stable dose of hydroxyurea and received placebo.

Following the recommendation of the DMC, we believe that we have taken the appropriate steps to ensure the integrity of the trial. Based upon subsequent discussions with the FDA, we believe that the primary efficacy analysis for the trial will be based only upon those patients on background hydroxyurea therapy, and that the Phase III trial maintains its status as a single pivotal trial that could result in the approval of senicapoc for the treatment of sickle cell disease in patients on background hydroxyurea therapy, provided that the results are sufficiently persuasive. We have submitted a protocol amendment and a revised statistical analysis plan to the FDA and have received no recommendation for changes. The revised statistical plan allows for the inclusion of 200 patients in the study, all on background hydroxyurea therapy. This decrease in sample size from the original study population of 300 patients down to 200 patients was made following an analysis of blinded data performed concurrently with the interim analysis because the observed variance in crisis rates was meaningfully less than what had been assumed in the original sample size calculations.

Although the FDA typically requires a minimum of two well-controlled Phase III clinical trials as the basis for approval, we believe that a single Phase III trial of senicapoc will be sufficient to serve as a basis for approval of a New Drug Application, or NDA, if the trial results are sufficiently persuasive. Our belief is based upon the size of this trial, the size of the orphan patient population, the fact that hydroxyurea was approved for the treatment of sickle cell disease on the basis of a single trial and our discussions with the FDA. The FDA has advised us that the acceptance of a single study as a sufficient basis for approval for a new indication would depend upon the strength of the data considering several factors, including internal consistency across study subsets, evidence of an effect on multiple endpoints and statistically very persuasive results.

We are conducting the Phase III study at approximately 65 sites across the U.S. and in selected other countries. We initiated the Phase III clinical trial in the first quarter of 2005. As of February 28, 2007, approximately 80% of the 200 patient target enrollment was complete. The study design includes ongoing safety analyses by the DMC at approximately six-month intervals.

In addition to the pivotal Phase III study focused on vaso-occlusive crises, we are also planning two additional Phase II efficacy studies in patients with sickle cell disease. The first of these is a Phase II study that we are planning to conduct in sickle cell disease patients who have secondary pulmonary hypertension, a common complication of this illness. We expect that this study will include approximately 36 patients and will involve a treatment period of approximately 24 weeks. Endpoints will include six minute walk distance and tricuspid valve regurgitant jet velocity, among other measures. The second of these is a Phase II study that we are planning to conduct in pediatric patients who are at risk of stroke, a common complication of this illness in pediatric patients. We expect that this study will also include approximately 36 patients and will involve a

treatment period of approximately 24 weeks. Endpoints will include transcranial doppler measurement of cerebral blood velocity, which is an indicator for the risk of stroke, among other measures. In preparation for this study, we are currently conducting a pediatric pharmacokinetic, safety and pharmacodynamic study in 28 patients. In this trial, senicapoc is being administered as monotherapy for the three-week treatment period. As of February 28, 2007, this trial was approximately 70% enrolled.

In addition to these clinical trials, other studies of senicapoc that we are conducting or are planning to conduct include the following:

- the FDA-required two-year rodent carcinogenicity studies that we initiated in 2004 and that are currently in progress,
- a drug metabolism study that we are planning to conduct using radiolabeled senicapoc to determine further the metabolism and excretion of senicapoc after oral doses in healthy volunteers, and
- an FDA-required study of cardiac conduction parameters, including the QT-interval, that we are planning to conduct.

McNeil Collaboration. In June 2004, we entered into collaboration and copromotion agreements with McNeil to develop and commercialize senicapoc for the treatment of sickle cell disease. Subject to satisfactorily completing clinical development and receiving required regulatory approvals, we and McNeil plan to copromote senicapoc in the United States and share equally in the profits and losses from the commercialization of senicapoc in the United States and, if we elect to copromote in Canada, from the commercialization of senicapoc in Canada. McNeil is entitled to commercialize senicapoc outside the United States, including in Canada if we do not elect to copromote in that country, pursuant to an exclusive license and is required to pay us a royalty on net product sales. Senicapoc has received fast track designation and orphan drug designation from the FDA. Please see "Our Collaborations – McNeil" for a discussion of our collaboration with McNeil.

Lead Compounds for Epilepsy and Neuropathic Pain

We have identified lead compounds that target a potassium channel located primarily on the membrane of nerve cells, or neurons, present in particular regions of the central and peripheral nervous system. We are developing these compounds for the treatment of epilepsy and neuropathic pain. We have retained all worldwide rights to these compounds.

Lead Compounds for Epilepsy

Disease overview. Epilepsy is a disorder characterized by episodic abnormal electrical activity in the brain resulting in seizures. There are many causes of epilepsy, including a history of trauma to the brain, tumor, bleeding, metabolic conditions and genetic conditions. There are three principal types of epilepsy:

- partial seizures, which affect a portion of the brain;
- generalized seizures, which affect the entire brain; and
- absence seizures, a type of generalized seizure that results in temporary loss of consciousness.

Regardless of the underlying cause or the specific type of seizure activity, seizures are the result of abnormal excitability of neurons in the brain that generate and transmit electrical impulses inappropriately.

Electrical impulses are generated within and between neurons as a result of ion movements across cell membranes. During an epileptic seizure there may be an imbalance of ion channel activity due to, or leading to, an imbalance in electrical activity in various neurons in specific regions of the brain. By reducing abnormal neuronal excitability through the modulation of ion channels, drugs may prevent seizures.

The ion channel target for the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain is one of the potassium ion channels responsible for determining the excitability of neurons in the central and peripheral nervous system. This channel is highly expressed in the central nervous system,

including regions linked to seizure disorders, such as the cortex, hippocampus and thalamus. When this channel is activated, it permits the flow of positively charged potassium ions out of the nerve cells in which these channels reside, thereby making the resting membrane potential inside these cells more negative. This more negative resting membrane potential decreases the electrical excitability of the nerve cell, thereby decreasing the likelihood for inappropriate or excessive electrical signals, such as those which occur during epileptic episodes. Genetic evidence also suggests a role for this channel in maintaining an appropriate negative resting membrane potential in nerve cells. Specifically, a rare genetic mutation in which this channel is not able to open properly has been linked to a syndrome involving convulsions in infancy.

Market opportunity and current treatment. Epilepsy represents a large and growing market opportunity. According to the Epilepsy Foundation, there is an estimated prevalence of 2.5 million patients in the United States, with approximately 180,000 new cases diagnosed in the United States each year. Sales of drugs currently marketed for the treatment of epilepsy totaled approximately $8.9 billion in the United States during 2006, according to IMS Health. These sales included prescriptions of these drugs for both epilepsy and other indications, including neuropathic pain. Despite the variety of drugs currently available, approximately one-third of the epilepsy patient population remains resistant to currently available medical treatment according to Brain, a journal of neurology.

Drugs currently approved for the treatment of epilepsy include Neurontin, Depakote, Topamax, Lamictal, Keppra and Tegretol. These drugs are believed to work through a variety of mechanisms, including inhibition of sodium ion channels and enhancement of an inhibitory neurotransmitter named GABA. Some drugs are more effective against some types of epilepsy than others, and individual therapy must be tailored to the particular patient. Many patients require combination therapy to adequately control seizure activity. Each of these drugs is associated with side effects, such as dizziness, drowsiness, fatigue, nausea and depression as well as mood, attention and sleeping disorders, which limit their utility in the treatment of many patients. For patients who are resistant to pharmaceutical treatment, implantable devices or surgery are sometimes considered as therapeutic options. Although such devices or surgery may be effective for some patients, invasive treatment options carry the risk of bleeding, infection or other complications, are generally reserved for a small subset of severely ill patients and are usually used only after medical therapy has failed.

Lead Compounds for Neuropathic Pain

Disease overview. Neuropathic pain is a particularly severe form of chronic pain that results from damage to the peripheral nervous system. Damage to the nervous system can result in neurons that are highly sensitized and that can produce pain in response to stimuli that would normally not be perceived as painful. The most common causes of neuropathic pain include diabetes and shingles, both of which are conditions in which there is damage to the peripheral nerves. Though rare, neuropathic pain may also be produced by damage to the central nervous system, particularly regions of the brain and spinal cord that are part of the normal pain pathways, including the thalamus. Neuropathic pain is often severe and notoriously unresponsive to standard pain treatments.

The ion channel target for the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain is expressed in the central and peripheral nervous system in pain pathways, including in sensory nerve cells such as the dorsal root ganglia. Near the spinal cord, the dorsal root ganglia collect and integrate pain impulses from the peripheral nerves. We believe that activation of this ion channel may reduce the excessive neuronal excitability that contributes to the sensation of neuropathic pain.

Market opportunity and current treatment. Approximately 23 million patients in the United States, Europe and Japan suffer from some form of neuropathic pain, spending an estimated $2.5 billion globally in 2004, according to data from Espicom Business Intelligence. A variety of drugs are used for the treatment of neuropathic pain, including some anticonvulsants, tricyclic antidepressants and antiarrhythmics.

Many anticonvulsants, such as Neurontin, Depakote and Lamictal, that were initially developed for the treatment of epilepsy have subsequently been demonstrated to be effective in other disorders of the central and

peripheral nervous system, including neuropathic pain, bipolar disorder and migraine headache. Despite the availability of several such drugs, neuropathic pain remains a poorly treated condition. According to the International Association for the Study of Pain, Neurontin is the drug most commonly prescribed for this condition, but is effective in only approximately 30% of patients. In addition, anticonvulsant drugs are associated with a number of side effects, as noted above. According to the International Association for the Study of Pain, tricyclic antidepressants, such as Amitriptyline, and antiarrhythmics, such as Mexiletine, also have limited efficacy. The use of antidepressants and antiarrhythmics is limited by their side effects, which may include sedation, nausea and dizziness.

Two additional agents, Cymbalta and Lyrica, have been approved by the FDA for the treatment of specified types of neuropathic pain. In clinical trials, the most common side effects associated with Cymbalta included nausea, somnolence, dizziness, dry mouth, constipation, hyperhidrosis, decreased appetite and asthenia, while those associated with Lyrica included dizziness, somnolence, dry mouth, peripheral edema, blurred vision, weight gain and difficulty with attention. In addition, Lyrica has been labeled as a "controlled substance" by the FDA, and is therefore subject to a number of restrictions regarding its distribution and use.

Lead Compounds. Our lead compounds target a particular potassium ion channel that is expressed in the central nervous system, including regions linked to seizure disorders such as the cortex, hippocampus and thalamus, and in pain pathways in the central and peripheral nervous system. In preclinical studies, these compounds:

- increased the activity of the target potassium channel in a selective and specific manner *in vitro*, thereby increasing the outflow of positively charged potassium ions from the nerve cell and decreasing excessive electrical activity;
- demonstrated broad spectrum anti-epileptic activity, including activity in animal models of partial seizures, generalized seizures and treatment-resistant seizures; and
- demonstrated activity in several animal models of neuropathic pain, including the Chung model, which is one of the most predictive models of neuropathic pain.

A Phase I trial of a compound, ICA-69673, from a different chemical class than our current lead compounds against this same target was initiated in 2004 and discontinued in 2005 for reasons that we believe were compound specific. The most advanced of our current lead compounds is currently in advanced preclinical studies. However, no assessment of the efficacy or safety of a product candidate can be considered definitive until all clinical trials needed to support a submission for marketing approval are complete. Success in preclinical studies does not mean that subsequent clinical trials will confirm the earlier findings.

Lead Compound for Atrial Fibrillation

The lead compound for atrial fibrillation is a small molecule ion channel inhibitor that we discovered in collaboration with Bristol-Myers Squibb. This compound targets a particular potassium channel located primarily on the membrane of atrial cardiac muscle cells. Bristol-Myers Squibb is developing this compound for the chronic treatment of atrial fibrillation. This compound is intended to be taken orally and is being developed for once-a-day or twice-a-day dosing. We have granted Bristol-Myers Squibb worldwide exclusive rights to this compound pursuant to a license under which we are entitled to payments if specified development and regulatory milestones are achieved. We are also entitled to royalties on net product sales.

Disease overview. Atrial fibrillation is a common cardiac disorder characterized by rapid and unsynchronized activity, or fibrillation, within the upper chambers of the heart, called the cardiac atria. Atrial fibrillation may cause three primary disease complications:

- a very rapid ventricular heart rate, which can potentially be life-threatening;
- a reduction in the amount of blood pumped by the heart to the body, called cardiac output, which can result in complications such as low blood pressure, shortness of breath, fainting and heart failure; and
- the formation of blood clots in the atria, which can result in life-threatening complications, including stroke and pulmonary embolism.

The heart is comprised of electrical conducting cells and muscle cells, called myocytes. Under normal circumstances, the electrical conducting cells send a synchronized electrical signal to the myocytes, providing for coordinated contraction and well-timed blood flow through the heart. Failure of the electrical impulse to be transmitted normally through the electrical conducting cells or the myocytes can result in an irregular heart rhythm, called an arrhythmia, such as atrial fibrillation.

All myocytes cycle through a period of contraction followed by a period of relaxation, corresponding to the contraction and relaxation of the heart. At the level of the myocyte, this cycle is controlled by electrical currents, which are in turn controlled by the activity of ion channels. The electrical charge inside the myocyte is negative in the resting state. Upon receiving an electrical stimulus from either an electrical conducting cell or another nearby myocyte, there is a sudden influx of sodium and calcium into the myocyte. This influx of positively charged ions generates an electrical signal, called an action potential, which triggers a sequence of events that culminates in contraction of the myocyte. Following sodium and calcium influx and myocyte contraction, there is a period of time, called the refractory period, during which the myocyte is not capable of conducting another action potential or of contracting. Eventually the opening of potassium channels permits the passage of potassium out of the myocyte, resulting in the re-establishment of a negative electrical charge inside the cell. Once the electrical charge inside the myocyte has thus been reset to a negative potential, the myocyte again becomes capable of generating another action potential and of contracting. The refractory period thus serves a critical role in preventing overly rapid stimulation of the myocytes.

In atrial fibrillation, there is a disruption in the normal transmission of the cardiac impulse such that it is not transmitted evenly throughout the cardiac atria. As a result, there is not a well-coordinated period of excitation followed by a period of relaxation. Instead, multiple aberrant currents are transmitted through the atria simultaneously, resulting in unsynchronized activity. These multiple aberrant currents can be reduced or eliminated by extending the refractory period of the atrial myocytes such that they are unable to respond to the aberrant signals, but only to the normal signal. At the cellular level, the refractory period can be extended by the inhibition of those potassium channels that are responsible for re-establishing the negative electrical charge inside the myocyte. The difficulty historically in pursuing this treatment approach has been that many drugs that are effective in prolonging the refractory period in the atria also do so in the ventricles, because they target ion channels that are expressed broadly throughout the heart. While prolonging the refractory period of the atria could potentially prevent atrial fibrillation, prolonging the refractory period in the ventricles can result in severe complications, including torsade de pointes, an often lethal arrhythmia.

In collaboration with Bristol-Myers Squibb, we identified several compounds that block a particular potassium ion channel target that is selectively expressed in atrial myocytes but not in ventricular myocytes. Moreover, in human tissue preparations, inhibition of this potassium ion channel extended the refractory period in atrial myocytes, but not in ventricular myocytes. Therefore, we believe that this potassium channel represents a potential target for the treatment of atrial fibrillation.

Market opportunity and current treatment. Atrial fibrillation is the most common persistent cardiac arrhythmia, with an estimated prevalence of 2.2 million patients in the United States according to the Journal of the American College of Cardiology, and approximately 160,000 new cases diagnosed in the United States each year according to the North American Society on Pacing and Electrophysiology. Atrial fibrillation is associated with aging, with approximately 9% of all individuals over the age of 80 affected by the disorder based on data from the National Institutes of Health.

There are two alternative treatment strategies for patients with atrial fibrillation:

- control of the ventricular heart rate and anticoagulation; and
- restoration of the normal cardiac rhythm.

The first treatment strategy is directed at treating the complications of atrial fibrillation, primarily a rapid ventricular heart rate, decreased cardiac output and the risk of blood clot formation. Physicians use a variety of

drugs, including beta blockers, calcium channel blockers and digitalis, to control the ventricular heart rate response to atrial fibrillation and improve cardiac output. These drugs are associated with a number of side effects, including lowered blood pressure, fatigue and depression. Because the underlying cardiac rhythm with these treatments remains atrial fibrillation, physicians must also use anticoagulants, such as warfarin, to prevent the formation of blood clots in the atria. The utility of this treatment approach is limited by (1) the risk of bleeding complications associated with anticoagulation therapy, which must therefore be closely monitored by blood tests, and (2) suboptimal improvement in cardiac output.

An alternative treatment strategy is directed at restoration of the normal cardiac rhythm. If it can be accomplished safely, restoration of the normal cardiac rhythm is preferable to management through anticoagulation and control of the ventricular heart rate. Restoring normal cardiac rhythm avoids the risks associated with anticoagulation therapy and often results in a more significant improvement in cardiac output. Currently available antiarrhythmic drugs for the conversion of atrial fibrillation to the normal cardiac rhythm include dofetilide, amiodarone and sotalol. In addition, the normal cardiac rhythm can also be restored through the application of an electrical shock to the chest wall or directly to the heart, called electrical cardioversion.

Many currently available therapeutic options for restoring normal cardiac rhythm are associated with potentially serious side effects. Because many currently available antiarrhythmic drugs lack specificity for atrial myocytes, they may induce life-threatening arrhythmias in the ventricles, including torsade de pointes, which can occur in as many as 1 to 5% of patients treated with some of these medications according to Basic & Clinical Pharmacology. In addition, many of these drugs are also associated with other potentially serious side effects. For example, amiodarone, one of the more commonly used drugs, has been associated with serious pulmonary and hepatic toxicity as well as thyroid abnormalities. Electrical cardioversion must be performed in the hospital setting under heavy sedation or anesthesia, or in the cardiac catheterization laboratory. Without ongoing medical therapy to prevent the recurrence of atrial fibrillation, many patients will relapse into atrial fibrillation following electrical cardioversion. Interventional treatments, such as ablation therapy or surgery, are also used, though rarely, for the treatment of atrial fibrillation. Thus, there is a significant unmet medical need for a safe and effective drug to restore and maintain normal cardiac rhythm in patients with this disorder.

Lead compound for atrial fibrillation. The lead compound for atrial fibrillation, discovered by Bristol-Myers Squibb in collaboration with us, targets a particular potassium ion channel that is selectively expressed in human atrial myocytes, but not in human ventricular myocytes. In preclinical studies conducted by us, Bristol-Myers Squibb or jointly by the parties, this compound:

- extends the refractory period in atrial myocytes *in vitro* without affecting that of ventricular myocytes;
- does not increase the incidence of life threatening ventricular arrhythmias, such as torsades de pointes, in animal studies, as do many antiarrhythmic drugs currently used for the conversion of atrial fibrillation to the normal cardiac rhythm; and
- demonstrates an acceptable safety and toxicity profile.

However, no assessment of the efficacy or safety of a product candidate can be considered definitive until all clinical trials needed to support a submission for marketing approval are complete. Success in preclinical studies does not mean that subsequent clinical trials will confirm the earlier findings.

In 2004, Bristol-Myers Squibb completed an initial Phase I safety study of another compound. The trial was a single-dose escalation study in healthy volunteers. We understand that in this study the compound demonstrated an acceptable safety and toxicity profile. Subsequently, Bristol-Myers Squibb initiated a Phase I proof-of-concept study in 2004. As a result of slow enrollment into that proof-of-concept study, during the fourth quarter of 2005 Bristol-Myers Squibb decided to discontinue the development of that compound in favor of a backup compound with superior pharmacokinetic properties. Bristol-Myers Squibb is currently conducting preclinical studies on this compound.

Lead Compounds for Dementia, Including Alzheimer's Disease, and ADHD

We have collaborated with Astellas to discover small molecule ion channel inhibitors that target a particular potassium channel located on the membrane of neurons in the hippocampus, a region of the brain that has been demonstrated to be important in the formation of memories and other central nervous system, or CNS, functions, as well as in certain other areas of the central nervous system. Astellas is developing certain of these compounds for the chronic treatment of memory loss associated with aging, such as occurs in dementia, including Alzheimer's disease. We are evaluating certain other of these compounds for potential development in certain other CNS indications, such as ADHD. We had considered developing these compounds for sleep disorders but are no longer pursuing this indication.

During 2004, Astellas selected one of these compounds for advanced preclinical studies. During 2005, Astellas decided not to pursue further development of that particular compound but instead decided to evaluate other lead compounds. Astellas holds worldwide exclusive rights to certain of these compounds pursuant to a license under which we are entitled to payments if specified development and regulatory milestones are achieved. We are also entitled to royalties on net product sales. We have the right to develop certain other compounds for certain other CNS indications, including ADHD, for which Astellas will be entitled to receive royalties on net product sales.

Disease overview. The brain is comprised of a complex network of neurons that enable memory, sensation, emotion and other cognitive functions. Neurons are highly specialized cells that are capable of communicating with each other through biochemical transmission across junctions called synapses. For this communication to occur, neurons secrete chemicals, known as neurotransmitters, that bind to receptors on neighboring neurons. Coordinated communication across synapses is essential for the formation of memories, the maintenance of attention, and other CNS activities.

Several classes of ion channels play a critical role in both the activation of neurons and in the secretion of neurotransmitters across synapses. In particular, some classes of potassium ion channels, sodium ion channels and calcium ion channels have been shown to be critical in the cascade of events that leads to the secretion of neurotransmitters in key regions of the brain associated with memory and attention, including the hippocampus. We believe that some of these channels may be important in the process of memory formation and retention and the maintenance of attention.

The two most common conditions involving dementia are Alzheimer's disease and benign senile dementia. A prominent feature of dementia is memory loss. Alzheimer's is a chronic debilitating disease, with patients suffering from a progressive dementia over a number of years, ultimately resulting in severe incapacitation and a shortened lifespan. Benign senile dementia is associated with the aging process, varies in severity and may be a precursor to Alzheimer's disease. While the causes of Alzheimer's disease and benign senile dementia are currently not well understood, it is widely recognized that particular regions of the brain, including the hippocampus, may play a central role in memory.

ADHD also represents an important disease area. ADHD is characterized by difficulty maintaining attention, modulating activity level and impulsive activity, resulting in maladaptive behaviors. The condition is often chronic, with symptoms present into adulthood. The pathophysiology of ADHD is not well understood, but is believed to involve certain neurotransmitter systems in particular regions of the brain.

Market opportunity and current treatment. Dementia, including Alzheimer's disease, represents an area of significant unmet medical need. According to the Alzheimer's Association, there are approximately 4.5 million Alzheimer's disease patients in the United States. According to Harrison's Principles of Internal Medicine, approximately 10% of all people over the age of 70 have significant memory loss; in more than half the cause is Alzheimer's disease. The total cost to the healthcare system of Alzheimer's disease is estimated at more than $100 billion per year in the United States, according to the Alzheimer's Association. Benign senile dementia represents another substantial market opportunity, with no drugs currently approved for this disorder.

Drugs currently used for the treatment of Alzheimer's disease include Aricept, Reminyl and Exelon. The primary shortcoming of these drugs is their limited efficacy. Despite their limited efficacy, the market for drugs used in the treatment of Alzheimer's disease is significant, with estimated sales of approximately $2.2 billion in the United States during 2005, according to IMS Health. Each of the currently marketed drugs benefits a relatively small proportion of patients, in whom the effects tend to be limited according to Harrison's Principles of Internal Medicine. Additionally, each of these drugs has significant side effects, including nausea, vomiting, diarrhea, slow heart rate, dizziness and insomnia.

The prevalence of ADHD is estimated at three to seven percent of children, and the disorder frequently persists into adulthood. Drugs currently used for the treatment of ADHD include Ritalin, Concerta, Adderall and Strattera. Combined sales of these agents were approximately $2.9 billion in the United States during 2006, according to IMS Health. Although approximately 70 to 80 percent of patients treated with these agents show improvement, some patients are not adequately treated with currently available therapies. Side effects associated with these drugs include appetite suppression, stomachache, headache and deceleration in rate of growth. In addition, one of these agents has recently been associated with potential liver toxicity.

Lead Compounds. The compounds being developed as a result of our collaboration with Astellas target a particular potassium ion channel that is expressed at high levels in regions of the brain that are central to the formation and retention of memories, and other CNS functions, such as attention. In preclinical studies conducted by us, Astellas or jointly by the parties, these compounds:

- enhanced electrical activity in these regions of the brain, in animal brain slice recordings; and
- improved the formation and retention of memories in animal models of age-related memory loss, including in animal models standard in the pharmaceutical industry for assessing memory, learning and activity.

However, no assessment of the efficacy or safety of a product candidate can be considered definitive until all clinical trials needed to support a submission for marketing approval are complete. Success in preclinical studies does not mean that subsequent clinical trials will confirm the earlier findings.

Research Programs

We believe that many of the ion channel targets we have identified offer opportunities to discover and develop novel therapies for a wide range of human diseases. We are currently pursuing research programs in two principal areas: pain disorders and inflammatory disorders. In each of these programs we have identified multiple validated ion channel targets and compounds with demonstrated *in vitro* and, in many cases, *in vivo* activity. In order to focus our research efforts, we have decided to no longer actively pursue our glaucoma program. The assets from this program remain available to us should we seek to expand our research efforts into this area in the future. We also intend to initiate new research programs in disease areas in which we believe that our approach offers clinically meaningful therapeutic advantages and for which there is a significant unmet medical need and commercial opportunity.

Pain Disorders

Scientific Overview. Pain disorders are classified into several categories based upon their cause. Neuropathic pain is a particularly severe pain disorder that results from damage to the central and peripheral nervous system. Inflammatory pain results from the effects of inflammatory mediators and cellular debris that are released into surrounding tissues as the immune system is activated, whether appropriately to fight infection, or inappropriately, such as in auto-immune disorders, including rheumatoid arthritis. Both neuropathic pain and inflammatory pain are types of chronic pain.

Ion channels play an important role in the detection, transmission and cognitive recognition of pain signals. Ion channels are critical at each step in the pain pathway, including the detection of local stimuli, the

transmission of the electrical impulses to the brain and the interpretation of electrical impulses as pain signals. The underlying mechanism through which ion channels are involved in the sensation of pain is through the modulation of the level of excitability of specialized nerve cells in the pain pathway. Consequently, we believe that by selectively modulating particular ion channels in the pain pathway, the detection, transmission or cognitive recognition of pain can be reduced.

Program Status. We have identified several ion channel targets that are expressed in pain pathways in both the central and peripheral nervous system. For several of these targets, we have identified lead compounds with *in vivo* efficacy in animal models of pain disorders.

Inflammatory Disorders

Scientific Overview. Inflammation is a reaction of the body to actual or perceived injury and is characterized by pain, heat, redness and swelling in the affected area. Under normal circumstances inflammation is a protective response, the goal of which is to eliminate both the initial cause of injury, such as bacteria or toxins, and the consequences of such injury, such as dead cells and tissues. However, if triggered or directed inappropriately, the inflammatory response can itself become harmful, leading to cell, tissue and organ destruction. Examples of such inappropriate or pathologic inflammation include some of the most common and disabling diseases, such as rheumatoid arthritis, Crohn's disease, lupus, psoriasis, asthma and chronic bronchitis. Although several different diseases and mechanisms can trigger the inflammatory response, the underlying process in each of these diseases is closely related, involving a number of different inflammatory cell types and chemical signaling factors.

Ion channels may play a key role in either the activation or modulation of the inflammatory response. For example, the activation of T-lymphocytes, an important cell type in this response, is believed to involve the influx of calcium into these cells through specialized ion channels. We believe the opening and closing of ion channels may modulate the movement of some immune system cells to the site of inflammation, the release of chemical signaling factors from immune system cells and the proliferation of these cells in response to activation of the immune system.

Program Status. We have completed profiling the distribution of all human ion channels known to us in various cells of the immune system. As a result, we have identified several ion channel targets that are expressed at high levels in some immune system cells and that may play an important role in modulating the inflammatory response. We have discovered compounds that are active *in vitro* against some of these targets, leading to decreases in calcium entry into immune system cells, decreases in immune system cell proliferation, decreases in immune system cell migration into tissues and other measures of inflammatory responses. We have also demonstrated effects of our compounds in animal models of inflammatory diseases.

Our Ion Channel Drug Discovery Technologies

We have established an integrated set of core technologies for the discovery of drugs that act upon ion channel targets. Our technologies broadly cover the key disciplines of importance to ion channel drug discovery, including molecular biology, electrophysiology, high throughput screening, chemistry, bioanalytics and pharmacology. Key elements of our core ion channel drug discovery technologies include the following:

Comprehensive Library of Ion Channel Genes

As the foundation of our ion channel focused drug discovery efforts, we have cloned over 300 human ion channel genes, which we believe represent substantially all of the human ion channel genome. We have an extensive collection of cell lines comprising these genes in a variety of specific configurations which mimic native channels in the human body. We also have developed a substantial number of cell lines that we can use as functional screening assays. This comprehensive library of clones, cell lines and assays enables us to:

- rapidly initiate new ion channel drug discovery programs;

- perform high throughput screens in parallel across multiple ion channel targets; and
- understand the relationships among various ion channels and classes of compounds that are active against ion channels.

Parallel High Throughput Screening Systems

We conduct high throughput screening against our ion channel targets in a parallel manner. Specifically, as we screen a particular ion channel target with a library of small molecules, we simultaneously screen other important safety or selectivity ion channel targets with the same set of compounds. The data we derive from these parallel screens provide important information not just on the potency of the compounds on the target of interest, but also on the potential of these compounds to cause side effects from activity at other ion channels. This approach enables us to focus our medicinal chemistry efforts only on those compounds that demonstrate both potency and selectivity for the target, thereby eliminating compounds that are likely to induce significant side effects. We believe that we apply this type of parallel screening earlier in the drug development process than many other companies pursuing ion channel drug discovery and that this approach may reduce our risk of failure in clinical trials.

Extensive Library of Ion Channel Focused Small Molecules

We have developed an extensive library of over 200,000 small molecules that have been selected for potential activity at ion channel targets. We have used our experience in working across a range of different ion channel targets to develop this library. We have found that some families of compounds show increased levels of activity against particular classes of ion channels. Through our synthetic medicinal chemistry efforts, combined with our proprietary computational chemistry technology, we continually enrich and expand our small molecule compound library with compounds that have demonstrated activity at ion channel targets.

Proprietary Computational Chemistry Technology

We have developed a proprietary computational chemistry technology that we use to identify active compounds based upon the information provided by our high throughput screening systems. Through the application of statistical techniques, this computational chemistry technology uses the information on relevant chemical parameters of the active compounds to construct a mathematical model of the general properties of compounds that may be active against the targeted ion channel. We use this model to perform a computer search of our compound library, the libraries of our collaborators and commercially available libraries, as well as the millions of compounds accessible *in silico*, for compounds with potential activity against the target. Through this approach, we are able to generate an enriched library containing multiple classes of compounds with activity against the targeted ion channel for subsequent medicinal chemistry efforts. We are able to generate this enriched library by screening a relatively small number of compounds, thereby accelerating our drug discovery process.

Extensive Database and Bioinformatics Platform

We have built an extensive database containing information on many ion channels across most ion channel families. We use this database to capture information we have obtained from studying the interactions between ion channel targets and small molecule compounds, and we apply this information across our drug discovery programs. We have created a discovery informatics infrastructure that facilitates our efficient management of large and complex data sets representing valuable ion channel information. We organize this data in a format that is readily accessible by our scientists, thereby facilitating decision making. Our database contains important information regarding:

- the characterization of each of our targets and compounds;
- the potency and selectivity of particular compounds or groups of compounds against ion channel targets we have studied;

- bioanalytical and pharmacological data; and
- information accessed from other proprietary and publicly available databases and sources.

Electrophysiology Know-How and Technical Expertise

We have assembled an experienced electrophysiology group equipped with state-of-the-art technologies and the capability to perform a wide variety of electrophysiologic measurements. The skill and expertise of our electrophysiology group enables us to understand the function of each of our ion channel targets under varying physiologic conditions and its modulation by drug candidates. Through the detailed analyses performed by this group, we are better able to understand the likely role of the channel in the tissue of interest and the likely effects of its modulation by small molecule compounds. In addition to our expertise in the application of traditional electrophysiologic techniques, we have also advanced our capabilities through the integration of recently developed high throughput electrophysiology equipment and techniques into our drug discovery process.

Pharmacology and Bioanalytics Expertise

We conduct iterative *in vitro* and *in vivo* testing of our compounds to characterize their pharmacologic and pharmacokinetic properties in detail. We employ a wide variety of animal models in disease areas of interest to understand the activity of our drug candidates in appropriate model systems. We also have advanced on-site bioanalytic capabilities in order to rapidly provide our scientists with important data regarding compound pharmacokinetics and metabolism.

Key Features of our Technology

We believe that our integrated technology platform enhances our capabilities in the discovery of drugs that act upon ion channel targets. We believe that our platform has the following key features:

Efficiencies Across Research Programs. By working broadly across the human ion channel genome, we can realize significant efficiencies in our drug discovery process, both in biology and in chemistry. Ion channels within a given family often share common characteristics. For example, when we determine the appropriate molecular biology techniques for constructing a cell line and high throughput screening assay for one member of a particular ion channel family, we typically obtain information that is important in determining the appropriate techniques for other members of the same family. Similarly, because of the structural similarity among ion channels of a given family, compounds in a series that are active at one member of a particular family may assist us in our efforts to identify compounds that are active at other members of the same family as well.

Efficient Target Validation and Lead Generation. While traditional drug discovery starts with the disease and seeks to identify potential intervention points, or drug targets, our target class approach starts with all potential ion channel targets and seeks to identify applications to the treatment of various diseases. We believe that our approach provides for a more efficient drug discovery process, because our in-depth understanding of the targets and methods for finding small molecule modulators of these targets obviates the need to develop new research tools each time a new target is identified. Instead, we use our knowledge and skill to quickly find potential small molecule modulators of particular ion channel targets. We then use these small molecules to validate the particular target in a relevant animal model of the disease. If such a small molecule demonstrates activity in a therapeutically relevant animal model, it both validates the target and provides a starting point for further medicinal chemistry efforts. We believe that our target class approach, combined with our integrated target validation and lead generation process, represents a more efficient drug discovery process than many traditional approaches.

Accelerated Development Cycle. Several elements of our technology platform contribute to an acceleration of the development cycle, including our cell lines and assay systems for many of our ion channel targets, our parallel high throughput screening systems, and our focused library of ion channel active compounds. In

addition, our computational chemistry technology reduces the need for screening large collections of compounds. Finally, our internal capabilities in animal studies, including our high throughput bioanalytics, which involve the measurement of compounds in the relevant animal systems, enable us to rapidly identify potent and selective drug candidates. When combined, these components of our discovery technology have enhanced our ability to efficiently advance from the initiation of a program to preclinical studies, thus allowing us to work simultaneously on several ion channel targets across a range of therapeutic areas.

Our Collaborations

A key element of our strategy is to establish strategic collaborations with leading pharmaceutical and biotechnology companies. We have entered into collaborations with McNeil, Bristol-Myers Squibb, Astellas and Abbott Laboratories. These collaborations provide us with an opportunity to extend our ion channel drug discovery technology into additional therapeutic areas and to benefit from the research, development and commercialization capabilities of our collaborators as well as to augment our financial resources. In the research phase of each of our collaborations with Bristol-Myers Squibb, Astellas and Abbott, our collaborators devoted substantial scientific and financial resources to our joint discovery efforts.

McNeil

In June 2004, we entered into collaboration and copromotion agreements with McNeil to develop and commercialize senicapoc for the treatment of sickle cell disease. Pursuant to the collaboration arrangement, McNeil paid us an initial upfront payment of $10.0 million and a milestone payment of $5.0 million upon acceptance of the protocol for our pivotal Phase III trial by the FDA. McNeil is potentially obligated to pay us up to an additional $48.0 million in milestone payments based on the achievement of specified clinical and regulatory milestones.

Under the terms of the agreements, we and McNeil have agreed to copromote senicapoc in the United States and share equally in profits and losses from the commercialization of senicapoc in the United States. We are also entitled to copromote senicapoc with McNeil, at our option, in Canada. We refer to the territories in which we copromote senicapoc with McNeil as the copromotion territory. In calculating profits and losses in the copromotion territory, each party's sales force costs generally are excluded, since each party generally is required to provide 50% of the overall sales force efforts. Under the collaboration agreement, we granted McNeil a worldwide exclusive license to senicapoc and other compounds covered by a specific patent. McNeil is entitled, subject to specified rights retained by us, to commercialize senicapoc and the other licensed compounds outside the copromotion territory pursuant to this license and is required to pay us a royalty on net product sales.

We and McNeil have agreed to fund equally the ongoing development costs incurred pursuant to an agreed upon development plan for senicapoc in the copromotion territory for sickle cell disease. McNeil is required to fund all development costs outside of the copromotion territory.

The term of the copromotion and profit and loss sharing arrangements in the copromotion territory extends so long as both parties are developing and commercializing senicapoc, but at least until the later of 15 years after commercial launch in the United States and the expiration of the patent rights licensed to McNeil in the copromotion territory. Each party has the right thereafter to continue developing and commercializing senicapoc unilaterally if the other party elects to cease joint development and commercialization. The payment of royalties to us by McNeil based on net product sales of senicapoc outside the copromotion territory extends, on a country-by-country basis, until the later of 15 years after commercial launch and the expiration of the last-to-expire patent rights licensed to McNeil in the country.

The United States patent rights licensed by us to McNeil expire between 2014 and 2019. The corresponding foreign rights include patents that expire between 2017 and 2020 and patent applications which, if issued as patents, are expected to expire between 2017 and 2020. See "Intellectual Property" below. We have retained the

first right to maintain and defend our intellectual property rights and have granted McNeil the right to assume the maintenance and defense of our intellectual property rights in those cases where we do not maintain and defend our intellectual property rights. McNeil has the first right to maintain and defend patents owned jointly by us and McNeil, and we have the right to assume the maintenance and defense of these patents if McNeil does not maintain and defend them.

We and McNeil have agreed that, except for products that are part of our collaboration, for the period from the effective date of the collaboration until the earlier of the seventh anniversary of the effective date or the third anniversary of the commercial launch of senicapoc in the United States, neither we nor McNeil will manufacture or sell specified types of pharmaceutical products for the treatment of sickle cell disease.

If McNeil fails to use commercially reasonable efforts to develop and commercialize senicapoc in specified countries outside the United States, we have the right to terminate McNeil's licenses in the specified countries. McNeil may terminate the collaboration without cause upon three months' prior notice following a period of two years from the inception of the collaboration. McNeil also may terminate the collaboration based upon an FDA requirement to stop clinical trials of senicapoc upon six months' prior notice if the requirement is not withdrawn during the six-month notice period. Either party may terminate the collaboration agreement or the copromotion agreement in the event of a material breach by the other party or the bankruptcy of the other party.

In addition, both we and McNeil have rights to terminate the copromotion agreement for specified failures by the other party to perform required detailing. McNeil also has the right to terminate the copromotion agreement for convenience after the end of the exclusivity period with respect to senicapoc as to sickle cell disease. In the event of a termination of the copromotion agreement as a result of a detail shortfall by McNeil or by McNeil for convenience, McNeil's rights under the collaboration agreement become limited in various ways, including the conversion of its right to share in profits and losses from the products being copromoted at the time of termination into a right to receive a royalty on net product sales or a share of sublicense income. In the event of a termination of the copromotion agreement as a result of a detail shortfall by us, the profit and loss sharing arrangement remains in place in the copromotion territory, but McNeil is entitled to include all of its sales force costs in subsequent calculations of profits and losses in the copromotion territory. We have the right to terminate the copromotion agreement for convenience during a specified period prior to the commercial launch of senicapoc. If we exercise this right, the profit and loss sharing arrangement remains in place in the copromotion territory, but McNeil is entitled to include all of its sales force costs in calculations of profits and losses in the copromotion territory. If the copromotion agreement is not terminated earlier, it expires upon the expiration or termination of the collaboration agreement.

If specified changes in control of us occur involving a list of five specified large pharmaceutical and biotechnology companies, McNeil is permitted to terminate the copromotion agreement and our governance rights under the collaboration agreement. In addition, in such event, our right to receive a share of profits and losses in the copromotion territory is converted into a right to receive a royalty on net product sales.

We and McNeil have also agreed that if either party identifies specified development and commercialization opportunities involving senicapoc for indications other than sickle cell disease or other specified blood disorders or involving licensed compounds other than senicapoc, the parties will include the identified opportunities in the collaboration if both parties agree to so include them. If the parties do not agree to include an identified opportunity in the collaboration, the identifying party has the right to unilaterally develop and commercialize the opportunity subject to royalty and sublicense income sharing obligations to the non-identifying party and a right of first refusal by the non-identifying party as to specified sublicensing arrangements involving the opportunity.

The collaboration is governed by a joint steering committee, consisting of an equal number of representatives of us and McNeil. There are also subcommittees with equal representation from both parties that have responsibility over development and commercialization matters. McNeil has responsibility for manufacturing matters. Ultimate decision making authority in the copromotion territory as to most development

matters is vested in us and as to most commercialization matters is vested in McNeil. A third category of decisions, including development, commercialization and call plans and budgets, requires the approval of both us and McNeil. Outside the United States, ultimate decision making authority as to development and commercialization is vested in McNeil.

Under the terms of the agreements, McNeil may fulfill its obligations by utilizing personnel and resources from other of its affiliated operating companies. In connection with an internal reorganization, McNeil has transitioned certain of its responsibilities with regard to our collaboration to other of its affiliated operating companies, including Johnson & Johnson Pharmaceutical Research and Development, LLC, a company that researches and develops prescription medications within Johnson & Johnson. Progress on the development program for senicapoc has continued as planned during this transition.

Bristol-Myers Squibb

In October 1997, we entered into a collaboration with Bristol-Myers Squibb to discover, develop and commercialize novel small molecule drugs that act on a specified ion channel target and that are identified as potential treatments for atrial fibrillation. Our collaborative research and development efforts with Bristol-Myers Squibb resulted in the identification of lead compounds for atrial fibrillation. In connection with this collaboration agreement, Bristol-Myers Squibb has paid us a total of $9.4 million through December 31, 2003, comprised of an upfront license fee and payments for research and development activities. The research phase of this collaboration was completed in September 2003.

Under this collaboration, we have granted Bristol-Myers Squibb worldwide exclusive licenses, with the right to grant sublicenses, to our patent rights and know-how with respect to drugs arising from the collaboration. In addition, we have granted Bristol-Myers Squibb the first right to maintain and defend our intellectual property rights relating to these drugs in some cases and have retained a right to assume the maintenance and defense of our intellectual property rights in those cases where Bristol-Myers Squibb does not maintain and defend our intellectual property rights. Bristol-Myers Squibb is responsible for worldwide clinical development of drug candidates and commercialization of drugs arising from this collaboration.

Bristol-Myers Squibb is obligated to make payments to us upon achievement of specified development and regulatory milestones. We are eligible to receive milestone payments of up to $35.0 million for each drug candidate developed. We are also entitled to royalties based on specified percentages of net product sales. Bristol-Myers Squibb's obligation to pay us royalties will expire generally on a country-by-country basis on the later to occur of (1) the expiration of the last-to-expire patent covering a product in a given country, or (2) ten years following the launch of the product in the given country.

If Bristol-Myers Squibb abandons development and commercialization of all products identified in this collaboration, we would have worldwide exclusive rights to those identified products that we own or control. If we commercialize a product identified in the research program after Bristol-Myers Squibb's abandonment, we would be obligated to pay Bristol-Myers Squibb a royalty on net product sales and specified amounts with respect to non-royalty income we receive from sublicensees. Either party may terminate the agreement in the event of a material breach by the other party.

Astellas

In March 2000, we entered into a collaboration with Astellas to discover, develop and commercialize novel small molecule drugs that act on specified ion channel targets and that are identified as potential treatments for dementia, including Alzheimer's disease. Our collaborative research and development efforts with Astellas resulted in the identification of several potential candidates for clinical development. In connection with this collaboration agreement, Astellas has paid us a total of $11.2 million through December 31, 2003, comprised of

an upfront license fee and payments for research and development activities. The research phase of this collaboration was completed in December 2003. In the fourth quarter of 2004, subsequent to the completion of the research phase, Astellas selected a compound for advanced preclinical studies. The selection of this compound resulted in the achievement of a milestone and the payment to us by Astellas of $500,000, which we received in the first quarter of 2005. During 2005, Astellas decided not to pursue further development of that particular compound but instead decided to evaluate other lead compounds.

Under this collaboration, we have granted Astellas worldwide exclusive licenses, with the right to grant sublicenses, to our patent rights and know-how with respect to drugs for dementia arising from the collaboration and exclusive licenses, with the right to grant sublicenses, to our patent rights and know-how in Asia with respect to drugs for other specified central nervous system diseases and conditions arising from the collaboration. Astellas' licenses with respect to these other drugs also extend outside of Asia if we do not elect to develop and commercialize these drugs outside of Asia. In addition, we have granted Astellas the first right to maintain and defend our intellectual property rights relating to these drugs in some cases and have retained a right to assume the maintenance and defense of our intellectual property rights in those cases where Astellas does not maintain and defend our intellectual property rights. Astellas is responsible for worldwide clinical development of drug candidates and commercialization of drugs arising from this collaboration, other than expenses incurred by us for development and commercialization activities that we pursue under our retained rights, as described below.

Astellas is obligated to make payments to us upon achievement of specified development and regulatory milestones. We are eligible to receive milestone payments of up to $27.5 million for the first drug candidate developed under the collaboration and up to $13.8 million for the second drug candidate developed under the collaboration. We are also entitled to royalties based on specified percentages of net product sales. Astellas' obligation to pay us royalties will expire generally on a country-by-country basis on the later to occur of (1) the expiration of the last-to-expire patent covering a product in a given country, or (2) ten years following the launch of the product in the given country.

We retain a worldwide exclusive option to products that Astellas does not elect to develop and commercialize. We also retain an exclusive option outside of Asia to products with respect to specified central nervous system diseases and conditions other than dementia and specified other disease areas retained by Astellas. In particular, we are currently evaluating certain lead compounds with potential application in the treatment of ADHD pursuant to our retained rights under this collaboration. If we exercise our option with respect to any product, we would be obligated to pay Astellas a royalty on net product sales. Either party may terminate the agreement in the event of a material breach by the other party.

Abbott

We have entered into two collaborations with Abbott. Our first collaboration with Abbott, which was initiated in 1997, expanded in 2000 and discontinued in 2001 concurrent with the formation of our second collaboration, was focused on the development and commercialization of compounds active at specified ion channel targets for the treatment of urologic disorders. Our second collaboration with Abbott, which was initiated in 2001 and concluded on December 31, 2005, was focused on the development and commercialization of compounds active at a specified ion channel target for the treatment of neuropathic pain. We understand that Abbott is no longer pursuing the development of compounds discovered under these collaborations.

Research and Development

For the years ended December 31, 2006, 2005 and 2004, the Company spent approximately $28.8 million, $25.9 million, and $20.4 million, respectively, on research and development activities. The aggregate revenues that we have recognized from our collaborators for research and development in each of the last three years were as follows: 2006 – $8.4 million; 2005 – $8.8 million; and 2004 – $6.5 million. For more information regarding our research and development expenses, please see "Financial Operations Overview" in "Management's Discussion and Analysis of Financial Condition and Results of Operations."

Intellectual Property

Patents and Trade Secrets

Our success depends in part on our ability to obtain and maintain proprietary protection for our product candidates, technology and know-how, to operate without infringing the proprietary rights of others and to prevent others from infringing our proprietary rights. Our policy is to seek to protect our proprietary position by, among other methods, filing United States and foreign patent applications related to our proprietary technology, inventions and improvements that are important to the development of our business. We also rely on trade secrets, know-how, continuing technological innovation and in-licensing opportunities to develop and maintain our proprietary position.

As of February 28, 2007, we owned approximately 50 United States patents and approximately 30 United States patent applications as well as numerous foreign counterparts to many of these patents and patent applications. Our patent portfolio includes patents and patent applications with claims directed to the composition of matter, pharmaceutical formulations and methods of use of many of our compounds, including senicapoc and the lead compound that we are developing for the treatment of epilepsy and neuropathic pain. We consider two patents directed at senicapoc and one application covering the chemotype which includes the lead compound that we are developing for the treatment of epilepsy and neuropathic pain to be material to our business.

The patent rights relating to senicapoc owned or licensed by us consist of two issued United States patents, one that expires in 2014 and a second, which is a composition of matter patent, that expires in 2019, and counterpart patents and patent applications in a number of other jurisdictions, including Europe and Japan. The patent rights relating to the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain owned by us consist of two United States patent applications and counterpart patent applications in a number of other jurisdictions, including Europe and Japan. Bristol-Myers Squibb holds the patent rights relating to the lead compound for atrial fibrillation. United States patents generally have a term of 20 years from the date of nonprovisional filing.

The patent positions of companies like ours are generally uncertain and involve complex legal and factual questions. Our ability to maintain and solidify our proprietary position for our technology will depend on our success in obtaining effective claims and enforcing those claims once granted. We do not know whether any of our patent applications or those patent applications that we license will result in the issuance of any patents. Our issued patents and those that may issue in the future, or those licensed to us, may be challenged, invalidated or circumvented, which could limit our ability to stop competitors from marketing related products or the length of term of patent protection that we may have for our products. In addition, our competitors may independently develop similar technologies or duplicate any technology developed by us, and the rights granted under any issued patents may not provide us with any meaningful competitive advantages against these competitors. Furthermore, because of the extensive time required for development, testing and regulatory review of a potential product, it is possible that, before any of our products can be commercialized, any related patent may expire or remain in force for only a short period following commercialization, thereby reducing any advantage of the patent.

We may rely, in some circumstances, on trade secrets to protect our technology. However, trade secrets are difficult to protect. We seek to protect our proprietary technology and processes, in part, by confidentiality agreements with our employees, consultants, scientific advisors and other contractors, as well as physical security of our premises and our information technology systems. These agreements may be breached, and we may not have adequate remedies for any breach. In addition, our trade secrets may otherwise become known or be independently discovered by competitors. To the extent that our consultants or contractors use intellectual property owned by others in their work for us, disputes may arise as to the rights in related or resulting know-how and inventions.

License Agreements

We are a party to a number of license agreements, primarily with academic institutions, under which we license patents, patent applications and other intellectual property. We enter into these agreements to augment the significant intellectual property created by our scientists. The licensed intellectual property covers some of the compounds that we are researching and developing, some ion channel targets and some of the scientific processes that we use. These licenses impose various diligence and financial payment obligations on us. We expect to continue to enter into these types of license agreements in the future. The only existing license that we consider to be material to our business is our agreement with Children's Medical Center Corporation, or CMCC, which is described below.

In February 2000, we entered into an agreement with CMCC for a worldwide exclusive license to products covered by the licensed patent rights. The patent rights licensed to us by CMCC include patent rights directed to the use of compounds such as senicapoc for most fields of human and veterinary therapeutics and diagnostics. We have the right to grant sublicenses under this license. Patents licensed under our agreement with CMCC expire over the period from 2012 through 2016.

In exchange for the rights licensed from CMCC, we paid CMCC an upfront license fee and license maintenance fees aggregating $250,000. We also paid CMCC $500,000 over the three-year period ended February 2003 for research conducted by CMCC that we agreed to sponsor in accordance with a sponsored research agreement entered into by CMCC and us in August 2000. In our sponsored research agreement with CMCC, CMCC granted us a right of first negotiation to obtain a worldwide exclusive license under patent rights resulting from the sponsored research.

We are obligated to pay CMCC specified amounts with respect to any sublicense income received by us. In connection with our collaboration with McNeil, this sublicense income includes upfront and milestone payments, royalties and our share of profits in the copromotion territory under our collaboration agreement with McNeil. McNeil paid us an initial upfront payment of $10.0 million, $1.3 million of which we paid to CMCC, and a milestone payment of $5.0 million upon acceptance of the protocol for our Phase III clinical trial of senicapoc by the FDA, $650,000 of which we paid to CMCC. Pursuant to the McNeil collaboration agreement, we are responsible for all amounts due to CMCC other than in respect of our share of profits in the copromotion territory, which we and McNeil have agreed to share equally.

Under our license agreement with CMCC, we are required to pay CMCC royalties on net product sales by us or our affiliates. We also are required to make payments to CMCC aggregating up to an additional $250,000 based on achieving specified development and regulatory milestones with respect to each licensed product, which is not a sublicensed product. We are entitled to a credit for the development and regulatory milestone payments that we make against the royalties that we would otherwise be obligated to pay of up to, but not more than, 50% of the royalties due in any given payment period.

Our royalty obligation with respect to each licensed product extends until the expiration of the last-to-expire patent, which is September 16, 2014 with respect to licensed products containing senicapoc, licensed from CMCC covering the licensed product in any country. Upon the later of the expiration of the last-to-expire licensed patent or February 2015, the agreement expires.

The agreement obligates us to use good faith and diligent efforts to develop senicapoc in accordance with an agreed development timetable and to use good faith and diligent efforts to commercialize one or more licensed products. CMCC has the right to terminate the agreement if we breach the agreement and fail to cure our breach within specified cure periods or in the event of our bankruptcy, liquidation, dissolution or cessation of operations.

Competition

The biotechnology and pharmaceutical industries are characterized by rapidly advancing technologies, intense competition and a strong emphasis on proprietary products. We face competition from many different sources, including commercial pharmaceutical and biotechnology enterprises, academic institutions, government agencies and private and public research institutions. We believe that our most significant competitors in the area

of drugs that work by modulating the activity of ion channels are Neurosearch A/S and Vertex Pharmaceuticals, Inc. In addition, there are a number of other companies, including large pharmaceutical companies, that have programs focused on specific ion channel drug discovery.

Many of our competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, clinical trials, regulatory approvals and marketing approved products than we do. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. Our commercial opportunity will be reduced or eliminated if our competitors develop and commercialize products that are safer, more effective, have fewer side effects or are less expensive than any products that we may develop. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies and technology licenses complementary to our programs or advantageous to our business.

We rely upon our collaborators for support in advancing certain of our drug candidates and intend to rely on our collaborators for the commercialization of these products. Our collaborators may be conducting multiple product development efforts within the same disease areas that are the subjects of their agreements with us. Generally, our agreements with our collaborators do not preclude them from pursuing development efforts using a different approach from that which is the subject of our agreement with them. Therefore, any of our drug candidates may be subject to competition with a drug candidate under development by a collaborator.

There are currently approved therapies for the diseases and conditions addressed by our drug candidate that is undergoing clinical trials and for the diseases and conditions that are the subjects of our principal preclinical development programs. Specifically,

- Hydroxyurea is used on a chronic basis to reduce the incidence of vaso-occlusive crises associated with sickle cell disease;
- drugs such as Neurontin, Depakote and Lamictal are approved for the treatment of epilepsy and, in the case of Neurontin, prescribed for neuropathic pain;
- Cymbalta and Lyrica are approved for the treatment of specified types of neuropathic pain;
- Amiodarone, Sotalol and Dofetilide are used for the treatment of atrial fibrillation;
- Reminyl, Aricept and Exelon are approved for the treatment of Alzheimer's Disease; and
- several drugs, including Ritalin, Concerta, Adderall and Strattera are approved for the treatment of ADHD.

See "Clinical and Preclinical Programs." There are also a number of companies working to develop new drugs and other therapies for these diseases that are undergoing clinical trials. The key competitive factors affecting the success of all of our drug candidates are likely to be their efficacy, safety, convenience and price.

There are a number of product candidates that have orphan drug designation from the FDA for sickle cell disease. Because these product candidates are not for the same drug as senicapoc, a decision by the FDA to approve these product candidates and their obtaining orphan drug exclusivity would not limit our ability to develop and commercialize senicapoc.

Government Regulation

Government authorities in the United States, at the federal, state and local level, and other countries extensively regulate, among other things, the research, development, testing, manufacture, labeling, promotion, advertising, distribution, marketing and export and import of pharmaceutical products such as those we are developing. The process of obtaining regulatory approvals and the subsequent substantial compliance with appropriate federal, state, local and foreign statutes and regulations require the expenditure of substantial time and financial resources.

United States Government Regulation

In the United States, the FDA regulates drugs under the Federal Food, Drug, and Cosmetic Act and implementing regulations. If we fail to comply with the applicable United States requirements at any time during

the product development process, approval process or after approval, we may become subject to administrative or judicial sanctions. These sanctions could include the FDA's refusal to approve pending applications, withdrawal of an approval, clinical holds, warning letters, product recalls, product seizures, total or partial suspension of production or distribution, injunctions, fines, civil penalties or criminal prosecution. Any agency enforcement action could have a material adverse effect on us.

The steps required before a drug may be marketed in the United States include:

- preclinical laboratory tests, animal studies and formulation studies under the FDA's good laboratory practices regulations;
- submission to the FDA of an Investigational New Drug application, or IND, for human clinical testing, which must become effective before human clinical trials may begin;
- adequate and well-controlled clinical trials to establish the safety and efficacy of the product for each indication;
- submission to the FDA of an NDA;
- satisfactory completion of an FDA inspection of the manufacturing facility or facilities at which the product is produced to assess compliance with current Good Manufacturing Practices, or cGMP; and
- FDA review and approval of the NDA.

Preclinical tests include laboratory evaluations of product chemistry, toxicity and formulation, as well as animal studies. An IND sponsor must submit the results of the preclinical tests, together with manufacturing information and analytical data, to the FDA as part of the IND. The IND must become effective before human clinical trials may begin. An IND will automatically become effective 30 days after receipt by the FDA, unless before that time the FDA raises concerns or questions about issues such as the conduct of the trials as outlined in the IND. In that case, the IND sponsor and the FDA must resolve any outstanding FDA concerns or questions before clinical trials can proceed. If these issues are unresolved, the FDA may not allow the clinical trials to commence.

Clinical trials involve the administration of the investigational product to human subjects under the supervision of qualified investigators. Clinical trials are conducted under protocols detailing, among other things, the objectives of the study, the parameters to be used in monitoring safety and the effectiveness criteria to be evaluated. Each protocol must be submitted to the FDA as part of the IND.

Clinical trials typically are conducted in three sequential phases, but the phases may overlap or be combined. Each trial must be reviewed and approved by an independent Institutional Review Board, or IRB, before it can begin at each site. Phase I trials usually involve the initial introduction of the investigational drug into humans to evaluate the product's safety, dosage tolerance and pharmacodynamics and, if possible, to gain an early indication of its effectiveness.

Phase II trials usually involve controlled trials in a limited patient population to:

- evaluate dosage tolerance and appropriate dosage;
- identify possible adverse effects and safety risks; and
- evaluate preliminarily the efficacy of the drug for specific indications.

Phase III trials usually further evaluate clinical efficacy and test further for safety in an expanded patient population. Phase I, Phase II and Phase III testing may not be completed successfully within any specified period, if at all. Furthermore, the FDA or we may suspend or terminate clinical trials at any time on various grounds, including a finding that the subjects or patients are being exposed to an unacceptable health risk. Similarly, an IRB can suspend or terminate approval of research when the research is not being conducted in accordance with the IRB's requirements or has been associated with unexpected serious harm to patients.

Assuming successful completion of the required clinical testing, the results of the preclinical studies and of the clinical studies, together with other detailed information, including information on the manufacture and composition of the product, are submitted to the FDA in the form of an NDA requesting approval to market the product for one or more indications. In most cases, the NDA must be accompanied by a substantial user fee. The FDA reviews an NDA to determine, among other things, whether a product is safe and effective for its intended use.

Under the Pediatric Research Equity Act of 2003, or PREA, NDAs or supplements to NDAs for a new active ingredient, new indication, new dosage form, new dosing regimen, or new route of administration must contain data to assess the safety and effectiveness of the drug for the claimed indications in all relevant pediatric subpopulations and to support dosing and administration for each pediatric subpopulation for which the drug is safe and effective. The FDA may grant deferrals for submission of data or full or partial waivers. Unless otherwise required by regulation, PREA does not apply to any drug for an indication for which orphan designation has been granted.

Before approving an application, the FDA will inspect the facility or the facilities where the product is manufactured. The FDA will not approve the product unless cGMP compliance is satisfactory. The FDA will issue an approval letter if it determines that the application, manufacturing process and manufacturing facilities are acceptable. If the FDA determines the application, manufacturing process or manufacturing facilities are not acceptable, it will outline the deficiencies in the submission and often will request additional testing or information. Notwithstanding the submission of any requested additional information, the FDA ultimately may decide that the application does not satisfy the regulatory criteria for approval.

The testing and approval process requires substantial time, effort and financial resources, and each may take several years to complete. The FDA may not grant approval on a timely basis, or at all. We may encounter difficulties or unanticipated costs in our efforts to secure necessary governmental approvals, which could delay or preclude us from marketing our products. The FDA may limit the indications for use or place other conditions on any approvals that could restrict the commercial application of the products. After approval, some types of changes to the approved product, such as adding new indications, manufacturing changes and additional labeling claims, are subject to further FDA review and approval.

After regulatory approval of a product is obtained, we are required to comply with a number of post-approval requirements. For example, as a condition of approval of an application, the FDA may require post-marketing testing and surveillance to monitor the product's safety or efficacy. In addition, holders of an approved NDA are required to report certain adverse reactions and production problems to the FDA, to provide updated safety and efficacy information and to comply with requirements concerning advertising and promotional labeling for their products. Also, quality control and manufacturing procedures must continue to conform to cGMP after approval. The FDA periodically inspects manufacturing facilities to assess compliance with cGMP, which imposes certain procedural and documentation requirements. Accordingly, manufacturers must continue to expend time, money and effort in the area of production and quality control to maintain compliance with cGMP and other aspects of regulatory compliance.

We rely, and expect to continue to rely, on third parties for the production of clinical and commercial quantities of our product candidates. Future FDA inspections may identify compliance issues at our facilities or at the facilities of our contract manufacturers that may disrupt production or distribution, or require substantial resources to correct. In addition, discovery of problems with a product or the failure to comply with requirements may result in restrictions on a product, manufacturer or holder of an approved NDA, including withdrawal or recall of the product from the market or other voluntary or FDA-initiated action that could delay further marketing. Newly discovered or developed safety or effectiveness data may require changes to a product's approved labeling, including the addition of new warnings and contraindications. Also, new government requirements may be established, including those requirements resulting from new legislation, that could delay or prevent regulatory approval of our products under development.

Orphan Drug Designation

We have received an orphan drug designation from the FDA for our product candidate senicapoc for the treatment of sickle cell disease. The FDA may grant orphan drug designation to drugs intended to treat a "rare disease or condition" that affects fewer than 200,000 individuals in the United States, or more than 200,000 individuals in the United States and for which there is no reasonable expectation that the cost of developing and making available in the United States a drug for this type of disease or condition will be recovered from sales in the United States for that drug. Orphan drug designation must be requested before submitting an application for marketing approval. Orphan drug designation does not convey any advantage in, or shorten the duration of, the regulatory review and approval process. If a product which has an orphan drug designation subsequently receives the first FDA approval for the indication for which it has such designation, the product is entitled to orphan drug exclusivity, which means the FDA may not approve any other application to market the same drug for the same indication for a period of seven years, except in limited circumstances, such as a showing of clinical superiority to the product with orphan exclusivity. Competitors may receive approval of different drugs or biologics for the indications for which the orphan product has exclusivity.

Fast Track Designation

We have obtained fast track designation from the FDA for our product candidate senicapoc for the treatment of sickle cell disease. The FDA's fast track programs, one of which is fast track designation, are designed to facilitate the development and review of new drugs that are intended to treat serious or life-threatening conditions and that demonstrate the potential to address unmet medical needs for the conditions. Fast track designation applies to a combination of the product and the specific indication for which it is being studied. Thus, it is the development program for a specific drug for a specific indication which receives fast track designation. The sponsor of a product designated as being in a fast track drug development program may engage in close early communication with the FDA including through timely meetings and feedback on clinical trials. Products in fast track drug development programs also may receive priority review or accelerated approval and sponsors may be able to submit portions of an application before the complete application is submitted. The FDA may notify a sponsor that its program is no longer classified as a fast track development program if the fast track designation is no longer supported by emerging data or the designated drug development program is no longer being pursued.

Foreign Regulation

In addition to regulations in the United States, we will be subject to a variety of foreign regulations governing clinical trials and commercial sales and distribution of our products. Whether or not we obtain FDA approval for a product, we must obtain approval of a product by the comparable regulatory authorities of foreign countries before we can commence clinical trials or marketing of the product in those countries. The approval process varies from country to country, and the time may be longer or shorter than that required for FDA approval. The requirements governing the conduct of clinical trials, product licensing, pricing and reimbursement vary greatly from country to country.

Under European Union regulatory systems, we may submit marketing authorization applications either under a centralized or decentralized procedure. The centralized procedure, which is compulsory for medicines produced by certain biotechnological processes and optional for those which are highly innovative, provides for the grant of a single marketing authorization that is valid for all European Union member states. All marketing authorizations for products designated as orphan drugs must be granted in accordance with the centralized procedure. The decentralized procedure provides for approval by one or more other, or concerned, Member States of an assessment of an application performed by one Member State, known as the reference Member State. Under this procedure, an applicant submits an application, or dossier, and related materials including a draft summary of product characteristics, and draft labeling and package leaflet, to the reference Member State and concerned Member States. The reference Member State prepares a draft assessment and drafts of the related materials within 120 days after receipt of a valid application. Within 90 days of receiving the reference Member State's assessment report, each concerned Member State must decide whether to approve the assessment report

and related materials. If a Member State cannot approve the assessment report and related materials on the grounds of potential serious risk to the public health, the disputed points may eventually be referred to the European Commission, whose decision is binding on all Member States.

Pharmaceutical Pricing and Reimbursement

In both domestic and foreign markets, sales of any products for which we receive regulatory approval for commercial sale will depend in part on the availability of reimbursement from third-party payors. Third-party payors include government healthcare program administrative authorities, managed care providers, private health insurers and other organizations. These third-party payors are increasingly challenging the price and examining the cost-effectiveness of medical products and services. In addition, significant uncertainty exists as to the scope of coverage and payment amounts for newly approved healthcare products. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost-effectiveness of our products. Our product candidates may not be considered medically necessary or cost-effective. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development.

Any products for which we receive marketing approval may be eligible for coverage in the U.S. under the Medicare prescription drug benefit program, which became effective in January 2006. Government payment for some of the costs of prescription drugs may increase demand for any products for which we receive marketing approval. However, to obtain payments under this program, we would be required to sell products to Medicare recipients through drug procurement organizations operating pursuant to this legislation. These organizations would negotiate discounted prices for our products, which are likely to be lower than we might otherwise charge. Any products for which we receive marketing approval may also be acquired by state-operated Medicaid programs. Medicaid rules constrain prices by requiring pharmaceutical suppliers to enter into rebate agreements that provide for quarterly payments to states based on the drug's average manufacturer price and best price, according to standards provided in Medicaid regulations. Private, non-governmental third-party payors frequently base their coverage policies and the prices they agree to pay on the policies and payment rates under the Medicare and Medicaid programs. Federal, state, and local governments in the United States continue to consider legislation to limit the growth of healthcare costs, including the cost of prescription drugs. Future legislation could limit payments for pharmaceuticals such as the drug candidates that we are developing.

The marketability of any products for which we receive regulatory approval for commercial sale may suffer if the government and third-party payors fail to provide adequate coverage and reimbursement. In addition, an increasing emphasis on managed care in the United States has increased and will continue to increase the pressure on pharmaceutical pricing.

Drug prices may be further constrained by possible Congressional action regarding drug reimportation into the United States. Some proposed legislation would allow the reimportation of approved drugs originally manufactured in the United States back into the United States from other countries where the drugs are sold at a lower price. Some governmental authorities in the U.S. are pursuing lawsuits to obtain expanded reimportation authority. Such legislation, regulations or judicial decisions could reduce the prices we receive for any products that we may develop, negatively affecting our revenues and prospects for profitability. Even without legislation authorizing reimportation, patients have been purchasing prescription drugs from Canadian and other non-United States sources, which has reduced the price received by pharmaceutical companies for their products.

Manufacturing

We do not currently own or operate manufacturing facilities for the production of clinical or commercial quantities of senicapoc or for compounds that we are testing in our preclinical programs. We currently rely, and expect to continue to rely, on third parties for the manufacture of our product candidates and any products that we may develop, other than small amounts of compounds that we synthesize ourselves for preclinical testing.

Pursuant to our collaboration with McNeil, McNeil has decision making authority with respect to the manufacture of senicapoc. We contract with one third-party manufacturer to supply us with the senicapoc bulk drug substance and a second manufacturer to perform fill/finish services. We obtain our supplies of the product candidates from both of these manufacturers on a purchase order basis. If either of these manufacturers should become unavailable to us for any reason, we believe that there are a number of potential replacements, although we might incur some delay in identifying or qualifying such replacements.

All of our drug candidates are organic compounds of low molecular weight, generally called "small molecules." We have selected these compounds not only on the basis of their efficacy and safety, but also for their ease of synthesis and the low cost of their starting materials. In particular, senicapoc and the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain are both manufactured in a simple synthetic process from readily available starting materials. There are no complicated chemistries or unusual equipment required in the manufacturing process. We expect to continue to develop drug candidates that can be produced cost-effectively at contract manufacturing facilities.

Sales and Marketing

If we receive regulatory approval for our product candidates, we plan to commence commercialization activities by building a focused sales and marketing organization complemented by copromotion and other arrangements with pharmaceutical or biotechnology collaborators. Our sales and marketing strategy is to:

- *Build our own domestic sales force.* We believe that we can access key prescribing physicians in the United States for a number of the drug candidates that we are developing through a relatively small, specialized sales force. In particular, we believe that such a sales force could address the community of hematologists who are the key specialists in treating sickle cell disease, for which we are developing senicapoc, and neurologists who are the key specialists in treating epilepsy, for which we have a preclinical program with lead compounds in development.
- *Recruit a marketing organization.* We plan to build a marketing and sales management organization to create and implement marketing strategies for any products that we market through our own sales organization and to oversee and support our sales force. The responsibilities of the marketing organization would include developing educational initiatives with respect to approved products and establishing relationships with thought leaders in relevant fields of medicine.
- *Establish marketing and sales alliances.* We plan to selectively enter into new strategic alliances with leading pharmaceutical and biotechnology companies to assist us in advancing our drug discovery and development programs. We also plan to retain United States marketing and sales rights or copromotion rights for our product candidates for which we receive marketing approvals in situations in which we believe it is possible to access the market through a focused, specialized sales force. For example, in 2004 we entered into such an alliance with McNeil to copromote senicapoc in the United States and, at our option, Canada. For situations in which a large sales force is required to access the market and with respect to markets outside of the United States, we generally plan to commercialize our drug candidates through various types of collaboration arrangements with leading pharmaceutical and biotechnology companies.

Scientific and Clinical Advisors

We have relationships with the following scientific and clinical advisors who are leading experts in the fields of ion channel biology and chemistry, preclinical studies, drug manufacturing or clinical trials. Our scientific and clinical advisors consult with us regularly on matters relating to:

- our research and development programs;
- the design and implementation of our clinical trials;
- market opportunities from a clinical perspective;

- new technologies relevant to our research and development programs; and
- scientific and technical issues relevant to our business.

Our current scientific and clinical advisors are:

John Adelman, Ph.D. Dr. Adelman is a senior scientist at the Vollum Institute with appointments in the Departments of Cell and Developmental Biology and Molecular and Medical Genetics in the School of Medicine at Oregon Health Science University. Dr. Adelman was formerly a research associate at Genentech. His research interests include the structure, function and physiological roles of potassium channels.

John Bettis, Ph.D. Dr. Bettis is a drug development consultant. Dr. Bettis has particular expertise in drug formulation development, clinical supplies manufacturing and process scale-up. Dr. Bettis has broad experience preparing CMC, IND and NDA documentation for use in FDA filings. Dr. Bettis was formerly vice president, technical development at Burroughs Wellcome.

Carlo Brugnara, M.D. Dr. Brugnara is a professor of pathology, Harvard Medical School and director of the Hematology Laboratory, Department of Laboratory Medicine at Children's Medical Center in Boston, Massachusetts. Dr. Brugnara is a recognized expert in basic and clinical research related to sickle cell disease and has published extensively in the field.

Shelley Ching, DVM, Ph.D. Dr. Ching is president of SVC Associates, a consulting firm specializing in preclinical development and safety assessment. Dr. Ching serves as an expert toxicologic pathologist for a variety of pharmaceutical companies and for the National Toxicology Program. Prior to forming her consulting firm, Dr. Ching held positions at Merck and Burroughs Wellcome, and was the international head, Full Development Programs and Medicines Safety Evaluation at Glaxo Wellcome.

John Dillberger, DVM, Ph.D. Dr. Dillberger is a toxicology consultant. Dr. Dillberger was formerly head of U.S. Pathology, a director of U.S. Based Development Projects, and a worldwide specialist in Oncology Drug Projects for Glaxo Wellcome. Dr. Dillberger also served as director of toxicology for Triangle Pharmaceuticals Inc.

Gerry S. Oxford, Ph.D. Dr. Oxford is professor of pharmacology and toxicology and executive director of the Stark Neurosciences Research Institute, an endowed unit of the Indiana University School of Medicine. In his role as institute director, Dr. Oxford coordinates research programs on fundamental molecular mechanisms underlying pain, addictive behaviors, repair of spinal injury, neurodegenerative disorders and affective disorders. Dr. Oxford is president-elect of the Association of Neuroscience Departments and Programs.

Roy Swaringen, Ph.D. Dr. Swaringen is a drug development consultant. Dr. Swaringen has particular expertise in the synthesis of active pharmaceutical ingredients for clinical trials and marketing. Dr. Swaringen has broad experience preparing CMC, IND and NDA documentation for use in FDA filings. Dr. Swaringen was formerly the director of the Chemical Development Laboratories for Burroughs Wellcome.

Dhirren Thakker, Ph.D. Dr. Thakker is the Ferguson Distinguished Professor and Associate Dean, Research and Graduate Education at the University of North Carolina at Chapel Hill School of Pharmacy. Dr. Thakker formerly held positions with Glaxo Inc., the National Institutes of Health, and the FDA. Dr. Thakker has particular expertise in the field of absorption, distribution, metabolism and excretion of drugs.

David R. Williams, Ph.D. Dr. Williams is the Harry G. Day chair and professor of organic chemistry at Indiana University. His work focuses on the chemistry of recently discovered, biologically active natural products and in understanding chemical reactions to allow formation of complex arrangements of stereochemistry and polyfunctionality. Dr. Williams has received numerous awards including a Merck Faculty Development Award, the Indiana University Teaching Excellence Recognition Award and the Tracy M. Sonneborn Award.

Employees

As of February 28, 2007, we had 64 full-time employees, including 29 with doctoral degrees. Of our workforce, 54 employees are engaged in research and development and 10 are engaged in business development, finance and administration. None of our employees is represented by labor unions or covered by collective bargaining agreements. We consider our relationship with our employees to be good.

Our Corporate Information

We were incorporated under the laws of Delaware in November 1992. Our principal executive offices are located at 4222 Emperor Boulevard, Suite 350, Durham, North Carolina 27703, and our telephone number is (919) 941-5206.

Available Information

We maintain a website at www.icagen.com. We make available, free of charge on our website, our Annual Report on Form 10-K, Quarterly Reports on Form 10-Q, Current Reports on Form 8-K, and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended, or the Exchange Act, as soon as reasonably practicable after we electronically file those reports with, or furnish them to the Securities and Exchange Commission, or the SEC. We also similarly make available, free of charge on our website, the reports filed with the SEC by our executive officers, directors and 10% stockholders pursuant to Section 16 under the Exchange Act as soon as reasonably practicable after copies of those filings are provided to us by those persons. We are not including the information contained at www.icagen.com, or at any other Internet address as part of, or incorporating it by reference into, this Annual Report on Form 10-K.

EXECUTIVE OFFICERS OF THE REGISTRANT

Our executive officers and their respective ages and positions as of February 28, 2007 are as follows:

Name	Age	Position
P. Kay Wagoner, Ph.D.	58	President, Chief Executive Officer and Director
Richard D. Katz, M.D.	43	Senior Vice President, Finance and Corporate Development, Chief Financial Officer and Treasurer
Edward P. Gray, J.D.	57	Senior Vice President, Intellectual Property, Chief Patent Counsel and Secretary
Seth V. Hetherington, M.D.	54	Senior Vice President, Development and Regulatory Affairs

P. Kay Wagoner, Ph.D. Dr. Wagoner is a co-founder of our company and has served as our president and a director since our inception and as chief executive officer since September 1996. Prior to founding Icagen, Dr. Wagoner served in research management positions at Glaxo Inc., a pharmaceutical company, where she initiated and led Glaxo's U.S. ion channel discovery efforts in central nervous system, cardiovascular and metabolic disease. Dr. Wagoner received her Ph.D. in physiology from the University of North Carolina, Chapel Hill. In 2001, Dr. Wagoner received the distinguished alumna award for science and business from the University of North Carolina, Chapel Hill. Dr. Wagoner also serves or has served on a variety of boards of directors, including the University of North Carolina's Graduate School Advisory Board and the Governing Body of the Biotechnology Industry Organization's (BIO) Emerging Companies Section. In 2004, Dr. Wagoner was awarded the Entrepreneurial Excellence Award by the Research Triangle based Council for Entrepreneurial Development, the largest entrepreneurial support organization in the United States, and the Ernst & Young Entrepreneur of the Year Regional Award for Life Sciences and Healthcare.

Richard D. Katz, M.D. Dr. Katz has been our senior vice president, finance and corporate development, and chief financial officer since April 2001. From August 1996 to 2001, Dr. Katz worked in the Investment Banking

Division of Goldman Sachs, an investment banking firm, most recently as a vice president in the Healthcare Group. Prior to joining Goldman Sachs, Dr. Katz earned a Masters in Business Administration from Harvard Business School where he graduated as a Baker Scholar. Dr. Katz earned his M.D. from the Stanford University School of Medicine and completed an internship in general surgery at the Hospital of the University of Pennsylvania. Dr. Katz received his A.B. in applied mathematics with high distinction from Harvard University.

Edward P. Gray, J.D. Mr. Gray has been our senior vice president, intellectual property, and chief patent counsel since August 2001 and our secretary since March 2004. Mr. Gray was retired from 1999 to 2001. From 1992 to 1999, Mr. Gray held several positions in the intellectual property department of Eli Lilly & Company, a pharmaceutical products company, including most recently assistant general patent counsel and special patent counsel. Mr. Gray also served from 1989 to 1992 as general counsel for Cardiac Pacemakers, Inc., a medical device company and former subsidiary of Eli Lilly. Mr. Gray received his J.D. from the University of Toledo and a B.S. in pharmacy from Butler University. Mr. Gray is a member of several state and federal bars, including the United States Supreme Court and the U.S. Court of Appeals, Federal Circuit. Mr. Gray is a member of the American Intellectual Property Law Association and the Licensing Executives Society and a past member of the Food and Drug Law Institute.

Seth V. Hetherington, M.D. Dr. Hetherington has been our senior vice president, development and regulatory affairs since June 2006. From June 2002 to June 2006, Dr. Hetherington served as Vice President, Clinical Development and Chief Medical Officer at Inhibitex, Inc., a biotechnology company. From May 1995 to June 2002, Dr. Hetherington held positions of increasing responsibility in clinical development, most recently Clinical Program Head, at GlaxoSmithKline and Glaxo Wellcome. Prior to joining Glaxo Wellcome, Dr. Hetherington held appointments at several leading academic medical centers, including the University of Tennessee, St. Jude Children's Research Hospital in Memphis and Albany Medical College. Dr. Hetherington earned his M.D. at the University of North Carolina, Chapel Hill.

Our officers are elected on an annual basis and serve at the discretion of our Board of Directors.

ITEM 1A—RISK FACTORS

Risks Related to Our Financial Results and Need for Additional Financing

We have incurred losses since inception and anticipate that we will continue to incur substantial losses for the foreseeable future. We might never achieve or maintain profitability.

We have a limited operating history and have not yet commercialized any products or generated any product revenues. As of December 31, 2006, we had an accumulated deficit of $100.7 million. We have incurred losses in each year since our inception in 1992. Our net losses were $24.8 million in 2006, $20.2 million in 2005 and $16.7 million in 2004. These losses resulted principally from costs incurred in our research and development programs and from our general and administrative expenses. We expect to continue to incur significant and increasing operating losses for at least the next several years as we continue our research activities, conduct development of, and seek regulatory approvals for, our initial drug candidates, and commercialize any approved drugs. These losses, among other things, have had and will continue to have an adverse effect on our stockholders' equity, total assets and working capital.

We have financed our operations and internal growth principally through the issuance of equity securities and funding under collaborations with leading pharmaceutical companies. We have devoted substantially all of our efforts to research and development, including clinical trials, and we have not completed development of any drugs. Because of the numerous risks and uncertainties associated with developing drugs targeting ion channels, we are unable to predict the extent of any future losses, whether or when any of our product candidates will become commercially available, or when we will become profitable, if at all. Even if we do achieve profitability, we may not be able to sustain or increase profitability on a quarterly or annual basis.

If we are unable to achieve and then maintain profitability, the market value of our common stock will decline.

We will need substantial additional funding and may be unable to raise capital when needed, which would force us to delay, reduce or eliminate our product development programs or commercialization efforts.

We expect our research and development expenses to increase in connection with our ongoing activities, particularly as the scope of the clinical trials that we are conducting expands. In addition, subject to regulatory approval of any of our product candidates, we expect to incur significant commercialization expenses for product sales, marketing, manufacturing and distribution. We will need substantial additional funding and may be unable to raise capital when needed or on attractive terms, which would force us to delay, reduce or eliminate our research and development programs or commercialization efforts.

We believe that our existing cash and cash equivalents, including the net proceeds from our private placement completed on February 6, 2007 and funding by McNeil of its share of senicapoc development costs, will be sufficient to enable us to fund our operating expenses, obligations under our equipment debt financing and capital expenditure requirements for at least the next 18 months. Our future capital requirements will depend on many factors, including:

- the scope and results of our research, preclinical and clinical development activities;
- the timing of, and the costs involved in, obtaining regulatory approvals;
- the cost of commercialization activities, including product marketing, sales and distribution;
- the costs involved in preparing, filing, prosecuting, maintaining and enforcing patent claims and other patent-related costs, including litigation costs and the results of such litigation;
- the extent to which we acquire or invest in businesses, products and technologies;
- the success of our collaborations with McNeil, Bristol-Myers Squibb and Astellas; and
- our ability to establish and maintain additional collaborations.

Until such time, if ever, as we can generate substantial product revenues, we expect to finance our cash needs through public or private equity offerings, debt financings and corporate collaboration and licensing arrangements. If we raise additional funds by issuing equity securities, our stockholders may experience dilution. Debt financing, if available, may involve agreements that include covenants limiting or restricting our ability to take specific actions, such as incurring additional debt, making capital expenditures or declaring dividends. Any debt financing or additional equity that we raise may contain terms, such as liquidation and other preferences, that are not favorable to us or our stockholders. If we raise additional funds through collaboration and licensing arrangements with third parties, it may be necessary to relinquish valuable rights to our technologies, research programs or product candidates or grant licenses on terms that may not be favorable to us.

If we fail to continue to meet all applicable Nasdaq Global Market requirements and Nasdaq determines to delist our common stock, the delisting could adversely affect the market liquidity of our common stock, impair the value of your investment and harm our business.

Our common stock is listed on the Nasdaq Global Market. In order to maintain that listing, we must satisfy minimum financial and other requirements. On October 27, 2006, we received notice from the Nasdaq Listing Qualifications Department that our common stock had not met the $1.00 per share minimum bid price requirement for 30 consecutive business days and that, if we were unable to demonstrate compliance with this requirement during the applicable grace periods, our common stock would be delisted after that time. On January 17, 2007, we were notified by Nasdaq that we had regained compliance with this listing requirement. Since regaining compliance, the closing bid price of our common stock has remained above $1.00 in compliance with the minimum bid price requirement.

Notwithstanding that the trading price of our common stock currently exceeds the minimum bid price required to maintain compliance with the Nasdaq Global Market listing requirements, it is possible that the minimum bid price of our common stock could fall below the required level. We may seek shareholder approval to effect a reverse stock split to prevent our common stock from dropping below the minimum bid price requirement; however, a reverse stock split may not prevent the common stock from dropping back down towards the Nasdaq minimum per share price requirement or below the required level. It is also possible that we would otherwise fail to satisfy another Nasdaq requirement for continued listing of our common stock.

If we fail to continue to meet all applicable Nasdaq Global Market requirements in the future and Nasdaq determines to delist our common stock, the delisting could adversely affect the market liquidity of our common stock, adversely affect our ability to obtain financing for the continuation of our operations and harm our business. This delisting could also impair the value of your investment.

If our stock price is volatile, purchasers of our common stock could incur substantial losses.

Our stock price is likely to be volatile. The stock market in general and the market for biotechnology companies in particular have experienced extreme volatility that has often been unrelated to the operating performance of particular companies. As a result of this volatility, investors may not be able to sell their common stock at or above the price at which they purchase it. The market price for our common stock may be influenced by many factors, including:

- results of clinical trials of our product candidates or those of our competitors;
- regulatory developments in the United States and foreign countries;
- variations in our financial results or those of companies that are perceived to be similar to us;
- changes in the structure of healthcare payment systems;
- market conditions in the pharmaceutical and biotechnology sectors and issuance of new or changed securities analysts' reports or recommendations;
- general economic, industry and market conditions; and
- the other factors described in this "Risk Factors" section.

Risks Related to Development of Product Candidates

We depend heavily on the success of our most advanced internal product candidates, senicapoc for sickle cell disease and lead compounds for epilepsy and neuropathic pain, which are still under development. If we are unable to commercialize either or both of these product candidates, or experience significant delays in doing so, our business will be materially harmed.

We have invested a significant portion of our efforts and financial resources in the development of our most advanced internal product candidates, senicapoc for sickle cell disease and our lead compounds for the treatment of epilepsy and neuropathic pain. Our ability to generate product revenues, which we do not expect in any case will occur earlier than 2009, will depend heavily on the successful development and commercialization of these product candidates, particularly senicapoc. The commercial success of these product candidates will depend on several factors, including the following:

- successful completion of clinical trials;
- receipt of marketing approvals from the FDA and similar foreign regulatory authorities;
- establishing commercial manufacturing arrangements with third-party manufacturers;
- launching commercial sales of the product, whether alone or in collaboration with others; and
- acceptance of the product in the medical community and with third-party payors.

We initiated a pivotal Phase III clinical trial of senicapoc for the chronic treatment of sickle cell disease in the first quarter of 2005. This clinical trial may not be successful. Following a planned interim analysis of safety, efficacy and futility by the DMC, the DMC recommended that enrollment continue only for patients on background hydroxyurea therapy. For currently enrolled patients not on hydroxyurea, the DMC recommended that the study drug be discontinued and that patients proceed to the end of study follow-up period. The DMC noted further that there were no specific safety issues identified. The DMC subsequently conducted a follow-up review of updated data on patients on background hydroxyurea therapy and did not recommend any further changes to the protocol.

It is also possible that the FDA could require us to perform additional studies of senicapoc, including additional Phase III clinical trials, particularly because of the protocol modification recommended by the DMC. For example, because the FDA normally requires two pivotal clinical trials to approve an NDA, even if we achieve favorable results in the Phase III clinical trial of senicapoc which we are conducting, the FDA may require that we conduct a second pivotal Phase III clinical trial if the FDA does not find the results to be sufficiently persuasive. In addition, the results of our Phase II clinical trial are not necessarily indicative of the results we will obtain in our Phase III or other subsequent clinical trials, particularly because the primary clinical endpoints of these trials are not the same.

Our efforts to commercialize the lead compounds that we are developing for epilepsy and neuropathic pain are at an earlier stage, as we are currently conducting preclinical studies of these drug candidates. If we are not successful in commercializing either or both of senicapoc and one of our lead compounds for epilepsy and neuropathic pain, or are significantly delayed in doing so, our business will be materially harmed.

We will not be able to commercialize our product candidates if our preclinical studies do not produce successful results or our clinical trials do not demonstrate safety and efficacy in humans.

Before obtaining regulatory approval for the sale of our product candidates, we must conduct, at our own expense, extensive preclinical tests and clinical trials to demonstrate the safety and efficacy in humans of our product candidates. Preclinical and clinical testing is expensive, difficult to design and implement, can take many years to complete and is uncertain as to outcome. Success in preclinical testing and early clinical trials does not ensure that later clinical trials will be successful, and interim results of a clinical trial do not necessarily predict final results. A failure of one or more of our clinical trials can occur at any stage of testing. We may experience numerous unforeseen events during, or as a result of, preclinical testing and the clinical trial process that could delay or prevent our ability to receive regulatory approval or commercialize our product candidates, including:

- regulators or institutional review boards may not authorize us to commence a clinical trial or conduct a clinical trial at a prospective trial site;
- our preclinical tests or clinical trials may produce negative or inconclusive results, and we may decide, or regulators may require us, to conduct additional preclinical testing or clinical trials or we may abandon projects that we expect to be promising;
- enrollment in our clinical trials may be slower than we currently anticipate, resulting in significant delays. For example, enrollment of patients in our Phase II clinical trial of senicapoc, our sickle cell disease product candidate, took longer than we initially expected. Additionally, participants may drop out of our clinical trials;
- we might have to suspend or terminate our clinical trials if the participating patients are being exposed to unacceptable health risks. For example, in March 2005, results of our multiple dose safety, tolerability and pharmacokinetic study of ICA-69673 did not support the continued development of ICA-69673 for the chronic oral treatment of epilepsy and neuropathic pain. As a result, at this time, we have decided not to pursue the further clinical development of this compound;
- regulators or institutional review boards may require that we hold, suspend or terminate clinical research for various reasons, including noncompliance with regulatory requirements;

- the cost of our clinical trials may be greater than we currently anticipate;
- any regulatory approval we ultimately obtain may be limited or subject to restrictions or post-approval commitments that render the product not commercially viable; and
- the effects of our product candidates may not be the desired effects or may include undesirable side effects or the product candidates may have other unexpected characteristics.

In our Phase II clinical trial of senicapoc for sickle cell anemia, the only adverse events that were dose-related and occurred more frequently in the active treatment arms than in the placebo arm were diarrhea and nausea. No patients elected to discontinue treatment with senicapoc prematurely as a result of these events. During the open label extension study to the Phase II clinical trial, the only adverse events that occurred in two or more patients considered possibly related to study medication were GGT elevation, rash and headache. Only two patients discontinued participation in the open label extension study as a result of adverse events that were considered possibly or probably related to study medication, one following a reversible increase in the level of GGT and another following a diagnosis of interstitial nephritis.

If we are required to conduct additional clinical trials or other testing of our product candidates beyond those that we currently contemplate, if we are unable to successfully complete our clinical trials or other testing or if the results of these trials or tests are not positive or are only modestly positive, we may:

- be delayed in obtaining marketing approval for our product candidates;
- not be able to obtain marketing approval; or
- obtain approval for indications that are not as broad as intended.

Our product development costs will also increase if we experience delays in testing or approvals. We do not know whether planned clinical trials will begin as planned, will need to be restructured or will be completed on schedule, if at all. For example, in our Phase III trial of senicapoc, the DMC recommended a modification to the protocol, as described above. This protocol modification may extend the timeline for completion of the study and may result in the need for additional studies. Significant clinical trial delays also could allow our competitors to bring products to market before we do and impair our ability to commercialize our products or product candidates.

Risks Related to Our Dependence on Third Parties for Manufacturing, Research and Development and Marketing and Distribution Activities

We depend significantly on collaborations with third parties to discover, develop and commercialize some of our product candidates.

A key element of our business strategy is to collaborate with third parties, particularly leading pharmaceutical companies, to research, develop and commercialize some of our product candidates. We are currently a party to three such collaborations, with McNeil, Bristol-Myers Squibb and Astellas. In 2006, research funding from our collaboration with McNeil accounted for 100% of our total net revenues. Research funding under our collaboration agreements with Bristol-Myers Squibb and Astellas has ended. Our collaborations may not be scientifically or commercially successful. The termination of any of these arrangements might adversely affect the development of the related product candidates and our ability to derive revenue from them.

The success of our collaboration arrangements will depend heavily on the efforts and activities of our collaborators. Our collaborators have significant discretion in determining the efforts and resources that they will apply to these collaborations. The risks that we face in connection with these collaborations, and that we anticipate being subject to in future collaborations, include the following:

- our collaboration agreements are for fixed terms and subject to termination by our collaborators in the event of a material breach by us;

- our collaborators in some cases have the first right to maintain or defend our intellectual property rights and, although we have the right to assume the maintenance and defense of our intellectual property rights if our collaborators do not, our ability to do so may be compromised by our collaborators' acts or omissions; and
- our collaborators may utilize our intellectual property rights in such a way as to invite litigation that could jeopardize or invalidate our intellectual property rights or expose us to potential liability.

Collaborations with pharmaceutical companies and other third parties often are terminated or allowed to expire by the other party. Such terminations or expirations would adversely affect us financially and could harm our business reputation.

If one of our collaborators were to change its strategy or the focus of its development and commercialization efforts with respect to our relationship, the success of our product candidates and our operations could be adversely affected.

There are a number of factors external to us that may change our collaborators' strategy or focus with respect to our relationship with them. For example:

- our collaborators may develop and commercialize, either alone or with others, products and services that are similar to or competitive with the products that are the subject of the collaboration with us;
- our collaborators may change the focus of their development and commercialization efforts. Pharmaceutical and biotechnology companies historically have re-evaluated their priorities from time to time, including following mergers and consolidations, which have been common in recent years in these industries. For example, in May 2004 our collaborator Yamanouchi signed a definitive merger agreement with Fujisawa Pharmaceutical Co., Ltd., which took effect on April 1, 2005, and Yamanouchi and Fujisawa were renamed Astellas Pharma Inc. As another example, during 2006 Johnson & Johnson acquired the Consumer Healthcare Business of Pfizer Pharmaceuticals, and is integrating this unit with McNeil; and
- the ability of our product candidates and products to reach their potential could be limited if our collaborators decrease or fail to increase spending relating to such products.

If any of the above factors were to occur, our collaborator might terminate the collaboration or not commit sufficient resources to the development, manufacture or marketing and distribution of our product or product candidate that is the subject of the collaboration. In such event, we might be required to devote additional resources to the product or product candidate, seek a new collaborator or abandon the product or product candidate, any of which could have an adverse effect on our business.

Under our collaboration agreement with McNeil, we are restricted from conducting specified types of manufacturing and commercialization activities.

Our collaboration agreement with McNeil provides that, except for products that are part of our collaboration, for the period from the effective date of the collaboration until the earlier of the seventh anniversary of the effective date or the third anniversary of the commercial launch of senicapoc in the United States, neither we nor McNeil may manufacture or sell specified types of pharmaceutical products for the treatment of sickle cell disease. This exclusivity provision applies during the term of our collaboration agreement with McNeil and to us for up to one year after termination if the collaboration agreement is terminated by McNeil based on our bankruptcy or breach.

The success of senicapoc depends heavily on our collaboration with McNeil, which was established in June 2004 and involves a complex sharing of control over decisions, responsibilities and costs and benefits. Any loss of McNeil as a collaborator, or adverse development in the collaboration, would materially harm our business.

In June 2004, we entered into a collaboration with McNeil to develop and commercialize senicapoc for the treatment of sickle cell disease. The collaboration involves a complex sharing of control over decisions,

responsibilities and costs and benefits. McNeil may terminate the collaboration relationship without cause upon three months prior notice. McNeil may also terminate the collaboration relationship based upon an FDA requirement to stop clinical trials of senicapoc upon six months prior notice if the requirement is not withdrawn during the six-month notice period. Any loss of McNeil as a collaborator in the development or commercialization of senicapoc, dispute over the terms of, or decisions regarding, the collaboration or other adverse development in our relationship with McNeil would materially harm our business.

We may not be successful in establishing additional collaborations, which could adversely affect our ability to discover, develop and commercialize products.

If we are unable to reach new agreements with suitable collaborators, we may fail to meet our business objectives for the affected product or program. We face significant competition in seeking appropriate collaborators. Moreover, these collaboration arrangements are complex and time-consuming to negotiate and document. We may not be successful in our efforts to establish additional collaborations or other alternative arrangements. The terms of any additional collaborations or other arrangements that we establish may not be favorable to us. Moreover, these collaborations or other arrangements may not be successful.

If third parties do not manufacture our product candidates in sufficient quantities and at an acceptable cost, clinical development and commercialization of our product candidates could be delayed, prevented or impaired.

We do not currently own or operate manufacturing facilities and have little experience in manufacturing pharmaceutical products. We rely and expect to continue to rely on third parties for the production of clinical and commercial quantities of our product candidates. There are a limited number of manufacturers that operate under the FDA's cGMP regulations and that are both capable of manufacturing for us and willing to do so. We do not have any long-term manufacturing agreements with third parties, and manufacturers under our short-term supply agreements are not obligated to accept any purchase orders we may submit. Our current and anticipated future dependence upon others for the manufacture of our product candidates may adversely affect our future profit margins and our ability to develop product candidates and commercialize any products that receive regulatory approval on a timely and competitive basis. In particular, if the third parties that are currently manufacturing senicapoc for clinical trials or that may in the future manufacture the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain for our preclinical studies or clinical trials should cease to continue to do so for any reason, we expect that we would experience delays in advancing these trials while we identify and qualify replacement suppliers.

Use of third-party manufacturers may increase the risk that we will not have adequate supplies of our product candidates.

Reliance on third-party manufacturers entails risks to which we would not be subject if we manufactured product candidates or products ourselves, including:

- reliance on the third party for regulatory compliance and quality assurance;
- the possible breach of the manufacturing agreement by the third party; and
- the possible termination or nonrenewal of the agreement by the third party, based on its own business priorities, at a time that is costly or inconvenient for us.

If we are not able to obtain adequate supplies of our product candidates and any approved products, it will be more difficult for us to develop our product candidates and compete effectively. Our product candidates and any products that we successfully develop may compete with product candidates and products of third parties for access to manufacturing facilities.

Our contract manufacturers are subject to ongoing, periodic, unannounced inspection by the FDA and corresponding state and foreign agencies or their designees to ensure strict compliance with cGMP regulations

and other governmental regulations and corresponding foreign standards. We cannot be certain that our present or future manufacturers will be able to comply with cGMP regulations and other FDA regulatory requirements or similar regulatory requirements outside the United States. We do not control compliance by our contract manufacturers with these regulations and standards. Failure of our third-party manufacturers or us to comply with applicable regulations could result in sanctions being imposed on us, including fines, injunctions, civil penalties, failure of regulatory authorities to grant marketing approval of our product candidates, delays, suspension or withdrawal of approvals, license revocation, seizures or recalls of product candidates or products, operating restrictions and criminal prosecutions, any of which could significantly and adversely affect supplies of our product candidates and products.

If third parties on whom we rely for clinical trials, such as Quintiles Transnational Corp., do not perform as contractually required or as we expect, we may not be able to obtain regulatory approval for or commercialize our product candidates, and our business may suffer.

We do not have the ability to independently conduct the clinical trials required to obtain regulatory approval for our products. We depend on independent clinical investigators, contract research organizations and other third-party service providers to conduct the clinical trials of our product candidates and expect to continue to do so for at least the next several years. We rely on Quintiles Transnational Corp. for the performance of most of our clinical trials. One of our directors, Dr. Dennis B. Gillings, is executive chairman and chief executive officer, and a member of the board of directors, of Quintiles Transnational Corp., and PharmaBio Development Inc. d/b/a NovaQuest, the holder of 4.8% of our outstanding capital stock, is a wholly owned subsidiary of Quintiles Transnational Corp.

We rely heavily on independent clinical investigators, contract research organizations and other third-party service providers for successful execution of our clinical trials, but do not control many aspects of their activities. We are responsible for ensuring that each of our clinical trials is conducted in accordance with the general investigational plan and protocols for the trial. Moreover, the FDA requires us to comply with standards, commonly referred to as Good Clinical Practices, for conducting and recording and reporting the results of clinical trials to assure that data and reported results are credible and accurate and that the rights, integrity and confidentiality of trial participants are protected. Our reliance on third parties that we do not control does not relieve us of these responsibilities and requirements. Third parties may not complete activities on schedule, or may not conduct our clinical trials in accordance with regulatory requirements or our stated protocols. The failure of these third parties to carry out their obligations could delay or prevent the development, approval and commercialization of our product candidates.

We plan to expand our internal clinical development and regulatory capabilities. We will not be successful in doing so unless we are able to recruit appropriately trained personnel and add to our infrastructure.

Risks Related to Our Intellectual Property

If we are unable to obtain and maintain protection for the intellectual property relating to our technology and products, the value of our technology and products will be adversely affected.

Our success will depend in large part on our ability to obtain and maintain protection in the United States and other countries for the intellectual property covering or incorporated into our technology and products. The patent situation in the field of biotechnology and pharmaceuticals generally is highly uncertain and involves complex legal and scientific questions. We may not be able to obtain additional issued patents relating to our technology or products. Even if issued, patents may be challenged, narrowed, invalidated or circumvented, which could limit our ability to stop competitors from marketing similar products or limit the length of term of patent protection we may have for our products. Changes in either patent laws or in interpretations of patent laws in the United States and other countries may diminish the value of our intellectual property or narrow the scope of our patent protection.

Our patents also may not afford us protection against competitors with similar technology. Because patent applications in the United States and many foreign jurisdictions are typically not published until 18 months after filing, or in some cases not at all, and because publications of discoveries in the scientific literature often lag behind actual discoveries, neither we nor our licensors can be certain that we or they were the first to make the inventions claimed in issued patents or pending patent applications, or that we or they were the first to file for protection of the inventions set forth in these patent applications.

If we fail to comply with our obligations in our intellectual property licenses with third parties, we could lose license rights that are important to our business.

We are a party to a number of license agreements. We consider only our license with CMCC to be material to our business. We expect to enter into additional licenses in the future. Our existing licenses impose, and we expect future licenses will impose, various diligence, milestone payment, royalty, insurance and other obligations on us. If we fail to comply with these obligations, the licensor may have the right to terminate the license, in which event we might not be able to market any product that is covered by the licensed patents.

If we are unable to protect the confidentiality of our proprietary information and know-how, the value of our technology and products could be adversely affected.

In addition to patented technology, we rely upon unpatented proprietary technology, processes and know-how. We seek to protect this information in part by confidentiality agreements with our employees, consultants and third parties. These agreements may be breached, and we may not have adequate remedies for any such breach. In addition, our trade secrets may otherwise become known or be independently developed by competitors. If we are unable to protect the confidentiality of our proprietary information and know-how, competitors may be able to use this information to develop products that compete with our products, which could adversely impact our business.

If we infringe or are alleged to infringe intellectual property rights of third parties, it will adversely affect our business.

Our research, development and commercialization activities, as well as any product candidates or products resulting from these activities, may infringe or be claimed to infringe patents or patent applications under which we do not hold licenses or other rights. Third parties may own or control these patents and patent applications in the United States and abroad. These third parties could bring claims against us or our collaborators that would cause us to incur substantial expenses and, if successful against us, could cause us to pay substantial damages. Further, if a patent infringement suit were brought against us or our collaborators, we or they could be forced to stop or delay research, development, manufacturing or sales of the product or product candidate that is the subject of the suit.

As a result of patent infringement claims, or in order to avoid potential claims, we or our collaborators may choose or be required to seek a license from the third party and be required to pay license fees or royalties or both. These licenses may not be available on acceptable terms, or at all. Even if we or our collaborators were able to obtain a license, the rights may be nonexclusive, which could result in our competitors gaining access to the same intellectual property. Ultimately, we could be prevented from commercializing a product, or be forced to cease some aspect of our business operations, if, as a result of actual or threatened patent infringement claims, we or our collaborators are unable to enter into licenses on acceptable terms. This could harm our business significantly.

There has been substantial litigation and other proceedings regarding patent and other intellectual property rights in the pharmaceutical and biotechnology industries. In addition to infringement claims against us, we may become a party to other patent litigation and other proceedings, including interference proceedings declared by the United States Patent and Trademark Office and opposition proceedings in the European Patent Office,

regarding intellectual property rights with respect to our products and technology. The cost to us of any patent litigation or other proceeding, even if resolved in our favor, could be substantial. Some of our competitors may be able to sustain the costs of such litigation or proceedings more effectively than we can because of their substantially greater financial resources. Uncertainties resulting from the initiation and continuation of patent litigation or other proceedings could have a material adverse effect on our ability to compete in the marketplace. Patent litigation and other proceedings may also absorb significant management time.

Risks Related to Regulatory Approval of Our Product Candidates

If we are not able to obtain required regulatory approvals, we will not be able to commercialize our product candidates, and our ability to generate revenue will be materially impaired.

Our product candidates and the activities associated with their development and commercialization, including their testing, manufacture, safety, efficacy, recordkeeping, labeling, storage, approval, advertising, promotion, sale and distribution, are subject to comprehensive regulation by the FDA and other regulatory agencies in the United States and by comparable authorities in other countries. Failure to obtain regulatory approval for a product candidate will prevent us from commercializing the product candidate. We have not received regulatory approval to market any of our product candidates in any jurisdiction. We have only limited experience in filing and prosecuting the applications necessary to gain regulatory approvals and expect to rely on third-party contract research organizations to assist us in this process. Securing FDA approval requires the submission of extensive preclinical and clinical data, information about product manufacturing processes and supporting information to the FDA for each therapeutic indication and inspection of facilities to establish the product candidate's safety and efficacy. Our future products may not be effective, may be only moderately effective or may prove to have undesirable or unintended side effects, toxicities or other characteristics that may preclude our obtaining regulatory approval or prevent or limit commercial use.

The process of obtaining regulatory approvals is expensive, often takes many years, if approval is obtained at all, and can vary substantially based upon the type, complexity and novelty of the product candidates involved. Changes in the regulatory approval policy during the development period, changes in or the enactment of additional statutes or regulations, or changes in regulatory review for each submitted product application, may cause delays in the approval or rejection of an application. The FDA has substantial discretion in the approval process and may refuse to accept any application or may decide that our data are insufficient for approval and require additional preclinical, clinical or other studies. In addition, varying interpretations of the data obtained from preclinical and clinical testing could delay, limit or prevent regulatory approval of a product candidate.

We may not be able to obtain orphan drug exclusivity for our products. If our competitors are able to obtain orphan drug exclusivity for their products that are the same drug as our products, we may not be able to have competing products approved by the applicable regulatory authority for a significant period of time.

Regulatory authorities in some jurisdictions, including Europe and the United States, may designate drugs for relatively small patient populations as orphan drugs. We have obtained an orphan drug designation from the FDA for our product candidate senicapoc for the treatment of sickle cell disease. Generally, if a product with an orphan drug designation subsequently receives the first marketing approval for the indication for which it has such designation, the product is entitled to a seven-year period of marketing exclusivity, which precludes the FDA from approving another marketing application for the same drug for that time period. For a drug composed of small molecules, the FDA defines "same drug" as a drug that contains the same active molecule and is intended for the same use. Orphan drug exclusivity in Europe lasts for ten years, but can be reduced to six years if a drug no longer meets the criteria for orphan drug designation or if the drug is sufficiently profitable so that market exclusivity is no longer justified. Obtaining orphan drug designation in Europe, where senicapoc has not been granted such status, and obtaining orphan drug exclusivity for senicapoc, both in the United States and in Europe, may be important to its success. If a competitor obtains orphan drug exclusivity for a product competitive with senicapoc before we do and if the competitor's product is the same drug as ours, we would be

excluded from the market. Even if we obtain orphan drug exclusivity for senicapoc, we may not be able to maintain it. For example, if a competitive product that is the same drug as our product is shown to be clinically superior to our product, any orphan drug exclusivity we have obtained will not block the approval of such competitive product. Also, senicapoc might not be entitled to orphan drug exclusivity if we were to obtain FDA approval for a broader indication.

The fast track designation for our sickle cell disease product candidate may not actually lead to a faster development or regulatory review or approval process.

If a drug is intended for the treatment of a serious or life-threatening condition and the drug demonstrates the potential to address unmet medical needs for this condition, the drug sponsor may apply for FDA fast track designation. Although we have obtained a fast track designation from the FDA for senicapoc for the treatment of sickle cell disease, we may not experience a faster development process, review or approval compared to conventional FDA procedures. Our fast track designation may be withdrawn by the FDA if it believes that the designation is no longer supported by data from our clinical development program. Our fast track designation does not guarantee that we will qualify for or be able to take advantage of the expedited review procedures.

Our products could be subject to restrictions or withdrawal from the market and we may be subject to penalties if we fail to comply with regulatory requirements, or if we experience unanticipated problems with our products, when and if any of them are approved.

Any product for which we obtain marketing approval, along with the manufacturing processes, post-approval clinical data, labeling, advertising and promotional activities for such product, will be subject to continual requirements of and review by the FDA and other regulatory bodies. These requirements include submissions of safety and other post-marketing information and reports, registration requirements, cGMP requirements relating to quality control, quality assurance and corresponding maintenance of records and documents, requirements regarding the distribution of samples to physicians and recordkeeping. Even if regulatory approval of a product is granted, the approval may be subject to limitations on the indicated uses for which the product may be marketed or to the conditions of approval, or contain requirements for costly post-marketing testing and surveillance to monitor the safety or efficacy of the product. Later discovery of previously unknown problems with our products, manufacturers or manufacturing processes, or failure to comply with regulatory requirements, may result in:

- restrictions on such products, manufacturers or manufacturing processes;
- warning letters;
- withdrawal of the products from the market;
- refusal to approve pending applications or supplements to approved applications that we submit;
- voluntary recall;
- fines;
- suspension or withdrawal of regulatory approvals;
- refusal to permit the import or export of our products;
- product seizure; and
- injunctions or the imposition of civil or criminal penalties.

Failure to obtain regulatory approval in international jurisdictions would prevent us from marketing our products abroad.

We intend to have our products marketed outside the United States. In order to market our products in the European Union and many other foreign jurisdictions, we must obtain separate regulatory approvals and comply

with numerous and varying regulatory requirements. With respect to some of our product candidates, our collaborator has, or we expect that a future collaborator will have, responsibility to obtain regulatory approvals outside the United States, and we will depend on our collaborators to obtain these approvals. The approval procedure varies among countries and can involve additional testing. The time required to obtain approval may differ from that required to obtain FDA approval. The foreign regulatory approval process may include all of the risks associated with obtaining FDA approval. We may not obtain foreign regulatory approvals on a timely basis, if at all. Approval by the FDA does not ensure approval by regulatory authorities in other countries or jurisdictions, and approval by one foreign regulatory authority does not ensure approval by regulatory authorities in other foreign countries or jurisdictions or by the FDA. We and our collaborators may not be able to file for regulatory approvals and may not receive necessary approvals to commercialize our products in any market.

Risks Related to Commercialization

The commercial success of any products that we may develop will depend upon the degree of market acceptance by physicians, patients, healthcare payors and others in the medical community.

Any products that we bring to the market may not gain market acceptance by physicians, patients, healthcare payors and others in the medical community. If these products do not achieve an adequate level of acceptance, we may not generate material product revenues and we may not become profitable. The degree of market acceptance of our product candidates, if approved for commercial sale, will depend on a number of factors, including:

- the prevalence and severity of any side effects;
- the efficacy and potential advantages over alternative treatments;
- the ability to offer our product candidates for sale at competitive prices;
- relative convenience and ease of administration;
- the willingness of the target patient population to try new therapies and of physicians to prescribe these therapies;
- the strength of marketing and distribution support; and
- sufficient third-party coverage or reimbursement.

If we are unable to establish sales and marketing capabilities or enter into agreements with third parties to market and sell our product candidates, we may be unable to generate product revenues.

We do not have a sales organization and have no experience in the sale, marketing or distribution of pharmaceutical products. To achieve commercial success for any approved product, we must either develop a sales and marketing organization or outsource these functions to third parties. Currently, we plan to build a focused specialty sales and marketing infrastructure to market or copromote some of our product candidates if and when they are approved. There are risks involved with establishing our own sales and marketing capabilities, as well as in entering into arrangements with third parties to perform these services. For example, developing a sales force is expensive and time-consuming and could delay any product launch. If the commercial launch of a product candidate for which we recruit a sales force and establish marketing capabilities is delayed as a result of FDA requirements or other reasons, we would incur related expenses too early relative to the product launch. This may be costly, and our investment would be lost if we cannot retain our sales and marketing personnel. In addition, marketing and promotion arrangements in the pharmaceutical industry are heavily regulated, and many marketing and promotional practices that are common in other industries are prohibited or restricted. These restrictions are often ambiguous and subject to conflicting interpretations, but carry severe administrative, civil, and criminal penalties for noncompliance. It may be costly to implement internal controls to facilitate compliance by our sales and marketing personnel.

If we are unable to obtain adequate reimbursement from third-party payors for any products that we may develop or acceptable prices for those products, our revenues and prospects for profitability will suffer.

Most patients will rely on Medicare and Medicaid, private health insurers and other third-party payors to pay for their medical needs, including any drugs we or our collaborators may market. If third-party payors do not provide adequate coverage or reimbursement for any products that we may develop, our revenues and prospects for profitability will suffer.

Regulatory approval to market a drug product does not assure that the product will be eligible for coverage by third-party payors or, assuming it is covered, that it will receive a profitable price. The process for obtaining third-party coverage and payment is costly and time-consuming. We may need to conduct expensive pharmacoeconomic studies in order to demonstrate the cost-effectiveness of our products. Our products may not be considered medically necessary or cost- effective. Adequate third-party reimbursement may not be available to enable us to maintain price levels sufficient to realize an appropriate return on our investment in product development.

A new Medicare prescription drug benefit program took effect in January 2006. While coverage provided through this program may increase demand for our products, participating suppliers are required to negotiate prices with drug procurement organizations on behalf of Medicare beneficiaries, and these procurement organizations may establish restrictive lists, or formularies, that limit which drugs are eligible for coverage. These prices are likely to be lower than we might otherwise obtain. Future legislation might allow government agencies to negotiate prices directly with drug companies, which could lead to even lower prices. Drugs sold to state-operated Medicaid programs are subject to mandatory rebate agreements that require quarterly payments to states based on the drug's average manufacturer price and best price. Private, non-governmental third-party payors frequently base their coverage policies and the prices they are willing to pay on the policies and payment rates under the Medicare and Medicaid programs.

A primary trend in the United States healthcare industry is toward cost containment. Third-party payors are challenging the prices charged for medical products and services, and many third-party payors limit reimbursement for newly-approved healthcare products. In particular, third-party payors may limit the indications for which they will reimburse patients who use any products that we may develop. Cost control initiatives could decrease the price we might establish for products that we may develop, which would result in lower product revenues to us.

U.S. drug prices may be further constrained by possible Congressional action regarding drug reimportation into the United States. Some proposed legislation would allow the reimportation of approved drugs originally manufactured in the United States back into the United States from other countries where the drugs are sold at a lower price. Some governmental authorities in the U.S. are pursuing lawsuits to obtain expanded reimportation authority. Such legislation, regulations, or judicial decisions could reduce the prices we receive for any products that we may develop, negatively affecting our revenues and prospects for profitability. Even without legislation authorizing reimportation, patients have been purchasing prescription drugs from Canadian and other non-United States sources, which has reduced the price received by pharmaceutical companies for their products.

In addition, in some foreign countries, particularly the countries of the European Union, the pricing of prescription pharmaceuticals is subject to governmental control. In these countries, pricing negotiations with governmental authorities can take six to 12 months or longer after the receipt of regulatory marketing approval for a product. To obtain reimbursement or pricing approval in some countries, we may be required to conduct a clinical trial that compares the cost-effectiveness of our product candidates or products to other available therapies. The conduct of such a clinical trial could be expensive and result in delays in commercialization of our products.

If product liability lawsuits are brought against us, we may incur substantial liabilities and may be required to limit commercialization of any products that we may develop.

We face an inherent risk of product liability exposure related to the testing of our product candidates in human clinical trials and will face an even greater risk if we commercially sell any products that we may

develop. If we cannot successfully defend ourselves against claims that our product candidates or products caused injuries, we will incur substantial liabilities. Regardless of merit or eventual outcome, liability claims may result in:

- decreased demand for any product candidates or products that we may develop;
- injury to our reputation;
- withdrawal of clinical trial participants;
- costs to defend the related litigation;
- substantial monetary awards to trial participants or patients;
- loss of revenue; and
- the inability to commercialize any products that we may develop.

We have product liability insurance that covers our clinical trials up to a $5.0 million annual aggregate limit with a deductible of $25,000 per claim. The amount of insurance that we currently hold may not be adequate to cover all liabilities that may occur. We intend to expand our insurance coverage to include the sale of commercial products if we obtain marketing approval for any products. Insurance coverage is increasingly expensive. We may not be able to maintain insurance coverage at a reasonable cost and we may not be able to obtain insurance coverage that will be adequate to satisfy any liability that may arise.

We face substantial competition which may result in others discovering, developing or commercializing products before or more successfully than we do.

The development and commercialization of new drugs is highly competitive. We face competition with respect to our current product candidates and any products we may seek to develop or commercialize in the future from major pharmaceutical companies, specialty pharmaceutical companies and biotechnology companies worldwide. Our competitors may develop products that are more effective, safer, more convenient or less costly than any that we are developing. Our competitors may also obtain FDA or other regulatory approval for their products more rapidly than we may obtain approval for ours. We believe that our most significant competitors in the area of drugs that work by modulating the activity of ion channels are large pharmaceutical companies which have internal ion channel drug discovery groups as well as smaller more focused companies engaged in ion channel drug discovery.

There are approved products on the market for all of the diseases and indications for which we are developing products. In many cases, these products have well known brand names, are distributed by large pharmaceutical companies with substantial resources and have achieved widespread acceptance among physicians and patients. In addition, we are aware of product candidates of third parties that are in development, which, if approved, would compete against product candidates for which we receive marketing approval.

Many of our competitors have significantly greater financial resources and expertise in research and development, manufacturing, preclinical testing, conducting clinical trials, obtaining regulatory approvals and marketing approved products than we do. Smaller or early stage companies may also prove to be significant competitors, particularly through collaborative arrangements with large and established companies. These third parties compete with us in recruiting and retaining qualified scientific and management personnel, establishing clinical trial sites and patient registration for clinical trials, as well as in acquiring technologies complementary to or necessary for our programs or advantageous to our business.

Our business activities involve the use of hazardous materials, which require compliance with environmental and occupational safety laws regulating the use of such materials. If we violate these laws, we could be subject to significant fines, liabilities or other adverse consequences.

Our research and development programs involve the controlled use of hazardous materials. Accordingly, we are subject to federal, state and local laws governing the use, handling and disposal of these materials. Although

we believe that our safety procedures for handling and disposing of these materials comply in all material respects with the standards prescribed by state and federal regulations, we cannot completely eliminate the risk of accidental contamination or injury from these materials. In addition, our collaborators may not comply with these laws. In the event of an accident or failure to comply with environmental laws, we could be held liable for damages that result, and any such liability could exceed our assets and resources. We maintain liability insurance for some of these risks, but our policy excludes pollution and has a coverage limit of $5.0 million.

Risks Related to Employees and Growth

If we fail to attract and keep senior management and key scientific personnel, we may be unable to successfully develop or commercialize our product candidates.

Our success depends on our continued ability to attract, retain and motivate highly qualified managerial and key scientific personnel. We consider retaining Dr. P. Kay Wagoner, our president and chief executive officer, to be key to our efforts to develop and commercialize our product candidates. All of our employees, other than Dr. Wagoner, Dr. Richard D. Katz, Dr. Seth V. Hetherington and Mr. Edward P. Gray, are at-will employees and can terminate their employment at any time. Our employment agreements with Dr. Wagoner, Dr. Katz, Dr. Hetherington and Mr. Gray are terminable by them on short notice.

In addition, our growth will require us to hire a significant number of qualified scientific and commercial personnel, including clinical development, regulatory, marketing and sales executives and field personnel, as well as additional administrative personnel. There is intense competition from other companies and research and academic institutions for qualified personnel in the areas of our activities. If we cannot continue to attract and retain, on acceptable terms, the qualified personnel necessary for the continued development of our business, we may not be able to sustain our operations or grow.

Risks Relating to Our Private Placement

The number of shares of our common stock outstanding has increased substantially as a result of the private placement that closed on February 6, 2007, and certain purchasers beneficially own significant blocks of our common stock; upon registration under the Securities Act of 1933, as amended, or the Securities Act, these shares will be generally available for resale in the public market.

Upon the closing of a private placement on February 6, 2007, we issued to a group of institutional and other accredited investors a total of 15,423,640 shares of our common stock, plus warrants to purchase a total of 5,398,256 additional shares of common stock. We refer to this transaction as the private placement. The issuance of these shares and warrants resulted in substantial dilution to stockholders who held our common stock prior to the private placement. Certain purchasers in the private placement will have significant influence over the outcome of any stockholder vote, including the election of directors and the approval of mergers or other business combination transactions.

Under the securities purchase agreement for the private placement, we have agreed to file a registration statement with the SEC covering the resale of the 15,423,640 shares of common stock issued in the private placement and the 5,398,256 shares of common stock issuable upon exercise of the warrants. Upon such registration of the shares issued in the private placement, these shares will become generally available for immediate resale in the public market. The market price of our common stock could fall due to an increase in the number of shares available for sale in the public market.

If we do not obtain and maintain effectiveness of the registration statement covering the resale of the shares issued in the private placement, we will be required to pay certain liquidated damages, which could be material in amount.

The terms of the securities purchase agreement that we entered into in connection with the private placement require us to pay liquidated damages to the purchasers in the private placement in the event that we do

not file the registration statement with the SEC within 30 days after the closing, the registration statement does not become effective or its effectiveness is not maintained beginning 90 days after the closing (if the registration statement is not reviewed by the SEC) or 120 days after the closing (if it is so reviewed) or, after the registration statement is declared effective by the SEC, the registration statement is suspended by us or ceases to remain continuously effective as to all registrable securities for which it is required to be effective, with certain specified exceptions. We refer to each of these events as a registration default. Subject to the specified exceptions, for each 30-day period or portion thereof during which a registration default remains uncured, we are obligated to pay each purchaser an amount in cash equal to 1% of that purchaser's aggregate purchase price, up to a maximum of 10% of the aggregate purchase price paid by that purchaser. These amounts could be material, and any liquidated damages we are required to pay could have a material adverse effect on our financial condition.

General Company Related Risks

Our executive officers, directors and principal stockholders have substantial control over us and could limit your ability to influence the outcome of matters submitted to stockholders for approval.

As of February 28, 2007, our executive officers, directors and stockholders who owned more than 5% of our outstanding common stock beneficially owned, in the aggregate, shares representing approximately 54% of our capital stock. As a result, if these stockholders were to choose to act together, they could influence or control matters submitted to our stockholders for approval, as well as our management and affairs. For example, these persons, if they choose to act together, could influence the election of directors and approval of any merger, consolidation or sale of all or substantially all of our assets. This concentration of voting power could lead to a delay in or prevent an acquisition of our company on terms that other stockholders may desire.

Provisions in our corporate charter documents, under Delaware law and in our collaboration agreement with McNeil may prevent or frustrate attempts by our stockholders to change our management and hinder efforts to acquire a controlling interest in us.

Provisions of our corporate charter and bylaws may discourage, delay or prevent a merger, acquisition or other change in control that stockholders may consider favorable, including transactions in which stockholders might otherwise receive a premium for their shares. These provisions may also prevent or frustrate attempts by our stockholders to replace or remove our management. These provisions include:

- a classified board of directors;
- limitations on the removal of directors;
- advance notice requirements for stockholder proposals and nominations;
- the inability of stockholders to act by written consent or to call special meetings; and
- the ability of our board of directors to designate the terms of and issue new series of preferred stock without stockholder approval, which could, among other things, be used to institute a "poison pill" that would work to dilute the stock ownership of a potential hostile acquirer, effectively preventing acquisitions that have not been approved by our board of directors.

The affirmative vote of the holders of at least 75% of our shares of capital stock entitled to vote is necessary to amend or repeal the above provisions of our corporate charter. In addition, absent approval of our board of directors, our bylaws may only be amended or repealed by the affirmative vote of the holders of at least 75% of our shares of capital stock entitled to vote.

In addition, Section 203 of the Delaware General Corporation Law prohibits a publicly held Delaware corporation from engaging in a business combination with an interested stockholder, generally a person which together with its affiliates owns or within the last three years has owned 15% of our voting stock, for a period of

three years after the date of the transaction in which the person became an interested stockholder, unless the business combination is approved in a prescribed manner. Accordingly, Section 203 may discourage, delay or prevent a change in control of our company.

Under our collaboration with McNeil, McNeil has the right to terminate the copromotion agreement and our governance rights under the collaboration agreement if specified changes in control of us occur involving a list of five specified large pharmaceutical and biotechnology companies. In addition, in such event, our right to receive a share of profits and losses in the copromotion territory is converted into a right to receive a royalty on net product sales. These provisions may have the effect of discouraging or preventing a change in control of our company.

A significant portion of our total outstanding shares may be sold into the market at any time. This could cause the market price of our common stock to drop significantly, even if our business is doing well.

Sales of a substantial number of shares of our common stock in the public market could occur at any time. These sales, or the perception in the market that the holders of a large number of shares intend to sell shares, could reduce the market price of our common stock. As of February 28, 2007, we had 37,782,857 shares of common stock outstanding. Substantially all of these shares, including, upon the effectiveness of the registration statement to be filed in connection with the private placement, the shares issued in the private placement, may be resold in the public market at any time. Moreover, holders of an aggregate of approximately 13,200,000 shares of our common stock have rights, subject to some conditions, to require us to file registration statements covering their shares or to include their shares in registration statements that we may file for ourselves or other stockholders. We also have registered all shares of common stock that we may issue under our equity compensation plans. As a result, they can be freely sold in the public market upon issuance.

ITEM 1B—UNRESOLVED STAFF COMMENTS

None.

ITEM 2—PROPERTIES

Our principal facilities consist of approximately 32,000 square feet of research and office space located at 4222 Emperor Boulevard, Durham, North Carolina which we occupy under several leases that expire over the period from 2008 to 2010.

ITEM 3—LEGAL PROCEEDINGS

We are not currently a party to any material legal proceedings.

ITEM 4—SUBMISSION OF MATTERS TO A VOTE OF SECURITY HOLDERS

None.

PART II

ITEM 5—MARKET FOR REGISTRANT'S COMMON EQUITY, RELATED STOCKHOLDER MATTERS AND ISSUER PURCHASES OF EQUITY SECURITIES

Market Information and Holders

Our common stock has traded on the Nasdaq Global Market (formerly the Nasdaq National Market) under the symbol "ICGN" since our IPO on February 3, 2005. The following table sets forth, for the calendar periods indicated, the range of high and low sales prices for our common stock on the Nasdaq Global Market:

2005	High	Low
First Quarter (commencing February 3, 2005)	$8.06	$5.35
Second Quarter	$7.97	$5.96
Third Quarter	$9.99	$6.30
Fourth Quarter	$6.90	$4.69

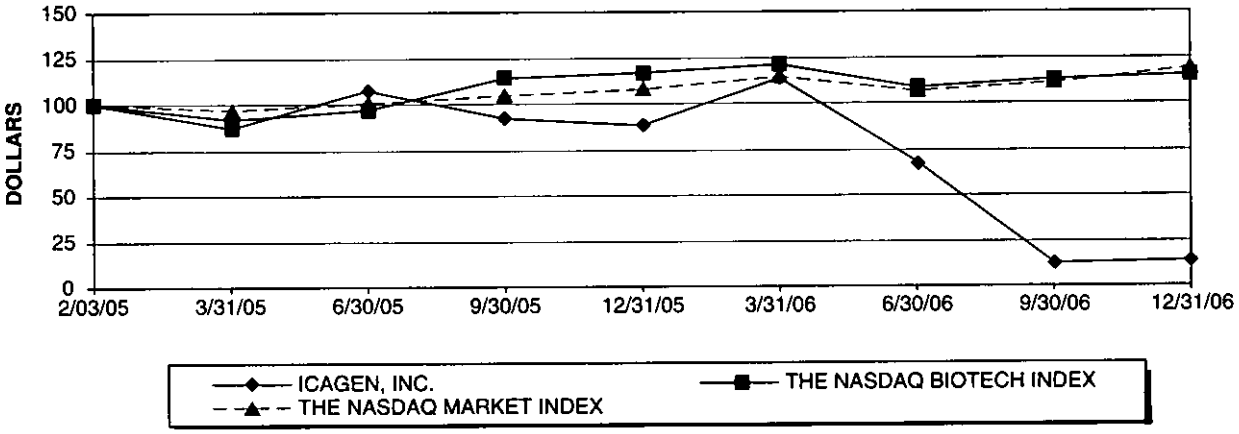
2006	High	Low
First Quarter	$9.25	$5.29
Second Quarter	$8.26	$4.63
Third Quarter	$5.00	$0.83
Fourth Quarter	$1.10	$0.66

On February 28, 2007, there were 136 stockholders of record of our common stock. On February 28, 2007, the last sale price reported on the Nasdaq Global Market for our common stock was $2.34 per share.

Performance Graph

The graph below compares the cumulative total stockholder return on our common stock for the period from February 3, 2005, the date of our initial public offering, through December 31, 2006 with the cumulative total return on the Nasdaq Market Index and the Nasdaq Biotechnology Index. Each comparison assumes the investment of $100 on February 3, 2005 in our common stock and in each of the indices and, in each case, assumes reinvestment of all dividends.

COMPARISON OF CUMULATIVE TOTAL RETURN
AMONG ICAGEN, INC.,
THE NASDAQ MARKET INDEX AND THE NASDAQ BIOTECH INDEX



	February 3, 2005	March 31, 2005	June 30, 2005	September 30, 2005	December 31, 2005	March 31, 2006	June 30, 2006	September 30, 2006	December 31, 2006
Icagen, Inc.	$100	$87.12	$107.53	$ 92.47	$ 88.36	$113.70	$ 68.49	$ 12.60	$ 13.84
The Nasdaq Market Index	100	97.11	100.49	104.99	107.95	114.50	106.88	111.15	119.14
The Nasdaq Biotechnology Index	100	91.85	97.19	114.43	116.96	121.26	108.86	113.16	115.33

The information included under the heading "Performance Graph" in Item 5 of this Annual Report on Form 10-K is "furnished" and not "filed" and shall not be deemed to be "soliciting material" or subject to Regulation 14A, shall not be deemed "filed" for purposes of Section 18 of the Exchange Act or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act or the Exchange Act.

Dividend Policy

We have never declared or paid cash dividends on our capital stock. We currently intend to retain all of our future earnings to finance the growth and development of our business. We do not intend to pay cash dividends to our stockholders in the foreseeable future.

Recent Sales of Unregistered Securities

We did not sell any equity securities that were not registered under the Securities Act in the fourth quarter of 2006.

Issuer Purchases of Equity Securities

We did not make any purchases of our shares of common stock in the fourth quarter of fiscal 2006, nor did any affiliated purchaser or anyone acting on behalf of us or an affiliated purchaser.

ITEM 6—SELECTED FINANCIAL DATA

The selected financial data set forth below should be read together with "Management's Discussion and Analysis of Financial Condition and Results of Operations" and our financial statements and related notes included in this Annual Report on Form 10-K.

The selected financial data set forth below as of December 31, 2006 and December 31, 2005 and for the years ended December 31, 2006, December 31, 2005 and December 31, 2004 are derived from our audited financial statements included in this Annual Report on Form 10-K. All other selected financial data set forth below is derived from our audited financial statements not included in this Annual Report on Form 10-K. Our historical results are not necessarily indicative of our results of operations to be expected in the future.

	Year ended December 31,				
	2006	2005	2004	2003	2002
	(in thousands, except share and per share data)				
Selected statement of operations data:					
Collaborative research and development revenues:					
Research and development fees	$ 1,953	$ 4,454	$ 4,643	$ 5,015	$ 6,911
Reimbursed research and development costs	6,467	4,340	1,851	447	439
Total collaborative research and development revenues	8,420	8,794	6,494	5,462	7,350
Operating expenses:					
Research and development	28,820	25,906	20,390	17,289	14,472
General and administrative	5,907	4,589	3,041	2,390	1,782
Total operating expenses	34,727	30,495	23,431	19,679	16,254
Loss from operations	(26,307)	(21,701)	(16,937)	(14,217)	(8,904)
Other income, net	1,499	1,452	214	47	307
Net loss	(24,808)	(20,249)	(16,723)	(14,170)	(8,597)
Gain on redemption of Series G preferred stock	—	—	—	7,719	—
Net loss attributable to common stockholders	$ (24,808)	$ (20,249)	$ (16,723)	$ (6,451)	$ (8,597)
Basic and diluted net loss per share attributable to common stockholders	$ (1.12)	$ (1.03)	$ (10.61)	$ (4.61)	$ (6.82)
Weighted average common shares outstanding—basic and diluted	22,219,662	19,636,848	1,575,923	1,399,190	1,260,069

	December 31,				
	2006	2005	2004	2003	2002
			(in thousands)		
Selected balance sheet data:					
Cash and cash equivalents	$ 25,131	$ 47,763	$ 30,217	$ 32,434	$ 26,561
Working capital	19,571	42,394	26,756	30,147	24,054
Total assets	30,815	54,393	38,137	36,647	30,923
Equipment debt financing, less current portion	774	1,194	732	925	1,087
Accumulated deficit	(100,740)	(75,932)	(55,683)	(38,960)	(32,509)
Total stockholders' equity	12,047	33,992	17,227	32,097	26,429

ITEM 7—MANAGEMENT'S DISCUSSION AND ANALYSIS OF FINANCIAL CONDITION AND RESULTS OF OPERATIONS

You should read the following discussion and analysis of our financial condition and results of operations together with our financial statements and the related notes and other financial information included elsewhere in this Annual Report on Form 10-K. Some of the information contained in this discussion and analysis or set forth elsewhere in this Annual Report on Form 10-K, including information with respect to our plans and strategy for our business and related financing, includes forward-looking statements that involve risks and uncertainties. You should review the section entitled "Risk Factors" of this Annual Report on Form 10-K for a discussion of important factors that could cause actual results to differ materially from the results described in or implied by the forward-looking statements contained in the following discussion and analysis.

Overview

We are a biopharmaceutical company focused on the discovery, development and commercialization of novel orally-administered small molecule drugs that modulate ion channel targets. Utilizing our proprietary know-how and integrated scientific and drug development capabilities, we have identified multiple drug candidates that modulate ion channels. Our four most advanced programs are:

- senicapoc for sickle cell disease. We initiated a pivotal Phase III clinical trial of senicapoc in the first quarter of 2005. In June 2004, we entered into collaboration and copromotion agreements with McNeil relating to the development and commercialization of senicapoc;
- lead compounds for epilepsy and neuropathic pain, for which we are conducting preclinical studies;
- a compound for atrial fibrillation, for which our collaborator Bristol-Myers Squibb is conducting preclinical studies; and
- lead compounds for dementia, including Alzheimer's disease, for which our collaborator Astellas is conducting preclinical studies, and lead compounds for ADHD, which were derived from the collaboration and for which we are conducting preclinical studies.

Since our incorporation in November 1992, we have devoted substantially all of our resources to the discovery and development of drug candidates with activity at ion channels. We currently have, either ourselves or with our collaborators, four clinical or preclinical drug development programs, as well as other drug discovery programs addressing specific ion channel targets. We have not received approval to market any product and, to date, have received no product revenues.

Since our inception, we have incurred substantial losses and, as of December 31, 2006, we had an accumulated deficit of $100.7 million. These losses and accumulated deficit have resulted from the significant costs incurred in the research and development of our compounds and technologies and general and administrative costs. We expect that our operating losses will continue and likely increase substantially for at least the next several quarters and years as we continue to expand our research, development and clinical trial activities and infrastructure.

A substantial portion of our revenue for at least the next several years will depend on our achieving development and regulatory milestones in our existing collaborative research and development programs and entering into new collaborations. Our revenue may vary substantially from quarter to quarter and year to year. Our operating expenses may also vary substantially from quarter to quarter and year to year based on the timing of clinical trial patient enrollment and our research activities. In particular, as we advance senicapoc in collaboration with McNeil and the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain, we expect that our research and development expenses will increase significantly. We believe that period-to-period comparisons of our results of operations are not meaningful and should not be relied on as indicative of our future performance.

The successful development of our product candidates is highly uncertain. We estimate that we will incur at least approximately $15.0 million over the course of the next two years, representing our portion of the development costs in our collaboration with McNeil, to complete the clinical development of senicapoc through the filing of an NDA in the U.S. and at least approximately $6.0 million over the course of the next two years to complete Phase I trials and, if the Phase I results are favorable, initiate Phase II trials of one of the lead compounds that we are developing for the treatment of epilepsy and neuropathic pain. We cannot reasonably estimate or know the nature, timing and estimated expenses of the efforts necessary to complete the remainder of the development of, or the period in which material net cash inflows will commence from, any of our product candidates due to the numerous risks and uncertainties associated with developing drugs, including the uncertainty of:

- the scope, rate of progress and expense of our clinical trials and other research and development activities;
- future clinical trial results;
- the expense of clinical trials for additional indications;
- the success of our collaboration with McNeil;
- the terms and timing of any collaborative, licensing and other arrangements that we may establish;
- the expense and timing of regulatory approvals;
- the expense of establishing clinical and commercial supplies of our product candidates and any products that we may develop;
- the effect of competing technological and market developments; and
- the expense of filing, prosecuting, defending and enforcing any patent claims and other intellectual property rights.

However, we do not expect to generate product revenue in any event earlier than 2009. If any of our programs experience delays or do not result in a commercial product, we would not generate revenue from that program in a timely manner or at all.

Critical Accounting Policies and Estimates

The discussion and analysis of our financial condition and results of operations set forth below are based on our financial statements, which have been prepared in accordance with U.S. generally accepted accounting principles. The preparation of these financial statements requires us to make estimates and judgments that affect the reported amounts of assets, liabilities, revenues and expenses. On an ongoing basis, we evaluate our estimates and judgments, including those described below. We base our estimates on historical experience and on various other assumptions that we believe to be reasonable under the circumstances. These estimates and assumptions form the basis for making judgments about the carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates under different assumptions or conditions.

We believe the following critical accounting policies affect our significant judgments and estimates used in the preparation of our financial statements.

Revenue Recognition

Our collaboration agreements contain multiple elements, including non-refundable upfront license fees, payments for reimbursement of research and development costs, payments for ongoing research and development, milestone payments associated with achieving development and regulatory milestones and royalties based on specified percentages of net product sales, if any. We consider a variety of factors in

determining the appropriate method of revenue recognition under these arrangements, such as whether the elements are separable, whether there are determinable fair values and whether there is a unique earnings process associated with each element of a contract.

We record cash received in advance of revenue recognition as deferred revenue and recognize revenues as services are performed over the applicable term of the agreement. When the period of deferral cannot be specifically identified from the agreement, we estimate the period based upon other factors contained within the agreement. We continually review these estimates, which could result in a change in the deferral period and the timing and the amount of revenue recognized.

When a payment is specifically tied to a separate earnings process, we recognize revenues when the specific performance obligation associated with the payment is completed. Performance obligations typically consist of significant milestones in the development life cycle of the related program, such as the initiation or completion of clinical trials, filing for approval with regulatory agencies and receipt of approvals by regulatory agencies. Revenues from milestone payments may be considered separable from funding for research and development services because of the uncertainty surrounding the achievement of milestones for products in early stages of development. Accordingly, we can recognize these payments as revenues if and when the performance milestone is achieved if they represent a separate earnings process as described in Emerging Issues Task Force, or EITF, Issue 00-21, *Revenue Arrangements with Multiple Deliverables*, or EITF 00-21.

In connection with our research and development collaborations with McNeil, Bristol-Myers Squibb, Astellas and Abbott, we recognize revenues from non-refundable upfront license fees, which we do not believe are specifically tied to a separate earnings process, ratably over the term of the agreement. With respect to our collaborations with Bristol-Myers Squibb, Astellas and Abbott, this period is the initial term of the research phase of the collaboration. With respect to our collaboration with McNeil, this period is the estimated life of the agreement, which is through the expiration of the last-to-expire patent covered by the agreement in 2019. Research and development services provided under some of these collaboration agreements are on a fixed fee basis. We recognize revenues associated with long-term, fixed fee contracts based on the performance requirements of the agreements and as services are performed. Our collaboration agreements with Bristol-Myers Squibb, Astellas and Abbott allowed for research term extensions, and each term extension provided for additional research fees to be paid to us based on the level of effort and length of time associated with the services provided. We recognize revenues from contract extensions as we perform the extended services.

We also recognize revenues derived from reimbursement of direct out-of-pocket expenses for research and development costs associated with one of our research collaboration agreements and with our cost sharing arrangement with McNeil. We reflect the associated research costs in our research and development expense.

In connection with our collaboration with McNeil, McNeil paid us an initial upfront payment of $10.0 million, $1.3 million of which we paid to CMCC, and a milestone payment of $5.0 million upon acceptance of the protocol for our Phase III clinical trial of senicapoc by the FDA, $650,000 of which we paid to CMCC in 2005. We are recognizing these payments from McNeil as revenue in accordance with Staff Accounting Bulletin No. 104, *Revenue Recognition*, or SAB 104, EITF 00-21 and other relevant accounting literature. Specifically, we recorded both the $10.0 million upfront payment and the $5.0 million milestone payment as deferred revenue, which we are amortizing to revenue over the estimated life of the agreement, which we have estimated to be 15 years. At the time of the execution of the agreement, we did not consider the achievement of the milestone above to represent a separate earnings process, and therefore we have elected to treat this payment in a manner consistent with the accounting treatment applied to the $10.0 million upfront payment rather than recognize this payment as revenue when received.

None of the payments that we have received from collaborators to date, whether recognized as revenue or deferred, are refundable even if the related program is not successful.

Accrued Expenses

As part of the process of preparing financial statements, we are required to estimate accrued expenses. This process involves identifying services that have been performed on our behalf and estimating the level of service performed and the associated cost incurred for such service where we have not yet been invoiced or otherwise notified of actual cost. We make these estimates as of each balance sheet date in our financial statements. Examples of estimated accrued expenses include:

- fees payable to contract research organizations in conjunction with clinical trials;
- fees payable to contract manufacturers in conjunction with the production of clinical trial materials; and
- professional service fees.

In accruing service fees, we estimate the time period over which services will be provided and the level of effort in each period. If the actual timing of the provision of services or the level of effort varies from the estimate, we will adjust the accrual accordingly. The majority of our service providers invoice us monthly in arrears for services performed. In the event that we do not identify costs that have begun to be incurred or we underestimate or overestimate the level of services performed or the costs of such services, our actual expenses could differ from such estimates. The date on which some services commence, the level of services performed on or before a given date and the cost of such services are often subjective determinations. We make judgments based upon the facts and circumstances known to us at each reporting period end.

Research and Development

We expense research and development costs as incurred. Research and development expense includes, among other things, clinical trial costs. We account for our clinical trial costs by estimating the total cost to treat a patient in each clinical trial and recognizing this cost, based on a variety of factors, beginning with the preparation for the clinical trial. This estimated cost includes payments to our contract research organizations for trial site and patient-related costs, including laboratory costs related to the conduct of the trial, and other costs. Our cost per patient varies based on the type of clinical trial, the site of the clinical trial and the length of the treatment period for each patient. As actual costs become known to us, we adjust our accrual; these changes in estimates may result in a material change in our clinical study accrual, which could materially affect our results of operations. Research and development expense includes those costs described under "Financial Operations Overview—Research and Development Expense" below.

Stock-Based Compensation

Effective January 1, 2006, we account for stock-based compensation in accordance with the fair value recognition provisions of Financial Accounting Standards Board, or FASB, Statement No. 123 (revised 2004), *Share-Based Payments*, or Statement 123(R). We use the Black-Scholes-Merton option-pricing model, which requires the input of subjective assumptions. These assumptions include estimating the length of time vested stock options are retained before being exercised, or the expected term, the estimated volatility of our common stock price over the expected term and the number of options that will ultimately expire or be forfeited. Changes to these subjective assumptions can materially affect the estimate of fair value of stock-based compensation and, consequently, the related amount recognized on the statements of operations.

Accounting for Income Taxes

Under our income tax policy, we record the estimated future tax effects of temporary differences between the tax basis of assets and liabilities and amounts reported in the accompanying balance sheets, as well as operating loss and tax credit carryforwards, including orphan drug credit carryforwards. We have recorded a full valuation allowance to reduce our deferred tax assets as, based on available objective evidence, it is more likely than not that the deferred tax asset will not be realized. In the event that we determine that we will be able to realize our deferred tax assets in the future, an adjustment to the valuation allowance would increase net income in the period the determination is made.

As of December 31, 2006, we had net operating loss carryforwards of approximately $75.6 million and research and development credit carryforwards of approximately $3.3 million for income tax purposes that begin to expire in the year 2011. Our orphan drug credit carryforwards of $19.4 million as of December 31, 2006 for income tax purposes begin to expire in 2019. The future utilization of our net operating loss carryforwards may be limited based upon changes in ownership, including changes resulting from our IPO, pursuant to regulations promulgated under the Internal Revenue Code.

Financial Operations Overview

Revenue

We do not currently have any commercial products for sale and do not anticipate having any commercial products for sale before 2009 at the earliest. To date, our revenue has been derived solely from our collaborations with McNeil, Bristol-Myers Squibb, Astellas and Abbott. The aggregate revenues that we have recognized from our collaborators for research and development in each of the last three years were as follows: 2006 – $8.4 million; 2005 – $8.8 million; and 2004 – $6.5 million. During the year ended December 31, 2006, revenues from our collaboration with McNeil accounted for 100% of our total net revenues. Research funding under our collaboration agreements with Bristol-Myers Squibb and Astellas had previously ended in 2003, and research funding under our collaboration agreement with Abbott ended on December 31, 2005.

In connection with our collaboration with McNeil, McNeil paid us an initial upfront payment of $10.0 million, $1.3 million of which we paid to CMCC in 2004, and a milestone payment of $5.0 million upon acceptance of the protocol for our pivotal Phase III clinical trial of senicapoc by the FDA, $650,000 of which we paid to CMCC in 2005. We are recognizing these payments from McNeil as revenue in accordance with SAB 104, EITF 00-21 and other relevant accounting literature.

In connection with our collaboration with Astellas, Astellas selected a compound with potential application in the treatment of dementia, including Alzheimer's disease, for advanced preclinical studies during the fourth quarter of 2004. The selection of this compound resulted in the achievement of a milestone and the recognition of $500,000 of revenue. We recognized the full amount of this milestone payment as revenue during the quarter in which the milestone was achieved, in accordance with SAB 104, EITF 00-21 and other relevant accounting literature.

Research and Development Expense

Research and development expense consists primarily of:

- salaries and related expenses for personnel;
- costs of facilities and equipment;
- fees paid to contract research organizations in conjunction with clinical trials;
- fees paid to contract manufacturers in conjunction with the production of clinical materials;
- fees paid to research organizations in conjunction with preclinical animal studies;
- costs of materials used in research and development;
- upfront license fees and milestone payments under in-licensing agreements;
- consulting, license and sponsored research fees paid to third parties; and
- depreciation of capital assets used to develop our products.

We expense both internal and external research and development costs as incurred. Our collaborators have paid for a portion of our research and development expenses in each of the last three years. We expect that research and development expenditures will continue to increase substantially during 2007 and subsequent years due to:

- the conduct in collaboration with McNeil of a comprehensive clinical development program of senicapoc for the treatment of sickle cell disease. Under the terms of our collaboration with McNeil, we and McNeil have agreed to fund equally the continued development of senicapoc in the copromotion territory;
- preclinical studies to select a compound for the treatment of epilepsy and neuropathic pain to advance into clinical development and through Phase I clinical trials; and
- the continued development of our research programs.

We use our employee and infrastructure resources for several projects. Consistent with our target class approach to drug development, many of our costs are not attributable to a specifically identified project, but instead are directed to broadly applicable research efforts. Accordingly, we do not account for internal research and development costs on a project-by-project basis. As a result, we cannot state precisely the total costs incurred for each of our clinical and preclinical projects on a project-by-project basis. Senicapoc for sickle cell disease and our lead compounds for epilepsy and neuropathic pain represent a substantial majority of the total research and development payments by us to third parties. The following table shows, for the periods presented, the total out-of-pocket payments made by us to third parties for preclinical study support, clinical supplies and clinical trials associated with these programs:

	Year ended December 31,		
Development Program	**2006**	**2005**	**2004**
		(in thousands)	
Senicapoc	$12,971	$ 9,790	$5,961
Lead compounds for epilepsy and neuropathic pain	1,655	2,205	1,926
Total	$14,626	$11,995	$7,887

We expect that a substantial percentage of our research and development expense in the future will be incurred in support of our current and future preclinical and clinical development programs. These expenditures are subject to numerous uncertainties in timing and cost to completion. In order to advance our drug development programs toward eventual commercialization of a drug product, we test compounds in numerous preclinical studies for safety, toxicology and efficacy. We then conduct clinical trials for each drug candidate. Throughout the drug development process, we make submissions to, and engage in discussions with, drug regulatory authorities, with the ultimate goal of submitting to these authorities and having approved applications for marketing approval. If we do not establish a collaboration for the program, we fund these activities ourselves. As we obtain results from trials, we may elect to discontinue or delay clinical trials for some product candidates in order to focus our resources on more promising product candidates. Completion of clinical trials by us or our collaborators may take several years or more, but the length of time generally varies substantially according to the type, complexity, novelty and intended use of a drug candidate. The cost of clinical trials may vary significantly over the life of a project as a result of a variety of factors, including:

- the number of patients who participate in the trials;
- the number of sites included in the trials;
- the length of time required to enroll trial participants;
- the duration of patient follow-up; and
- the efficacy and safety profile of the product candidate.

None of our drug candidates has received FDA or foreign regulatory marketing approval. We completed a Phase II clinical trial for senicapoc in 2004 and are conducting a pivotal Phase III clinical trial of this product

candidate in collaboration with McNeil. In order to achieve marketing approval, the FDA or foreign regulatory agencies must conclude that our or our collaborators' clinical data establishes the safety and efficacy of the drug candidates. Furthermore, our strategy includes entering into collaborations with third parties to participate in the development and commercialization of some of our products, such as our ongoing collaborations with McNeil, Bristol-Myers Squibb and Astellas and our prior collaboration with Abbott. In situations in which third parties have control over the preclinical development or clinical trial process for a product, the estimated completion date is largely under control of that third party rather than under our control. We cannot forecast with any degree of certainty which of our drug candidates will be subject to future collaborations or how such arrangements will affect our development plan or capital requirements.

As a result of the uncertainties discussed above, we are unable to determine the duration and completion costs of our research and development projects, anticipated completion dates or when and to what extent we will receive cash inflows from the commercialization and sale of a product. However, we do not expect to generate product revenue in any event earlier than 2009.

General and Administrative Expense

General and administrative expense consists primarily of salaries and other related costs for personnel serving finance, accounting, intellectual property, information technology, human resource and administrative functions. Other costs include facility costs not included in research and development expense, insurance, professional fees for legal, accounting and public relations services and the legal costs of pursuing patent protection for our intellectual property. We expect that general and administrative expenditures will increase during 2007 and subsequent years due to increasing payroll, public company expenses, our initial commercialization expenses if we receive marketing approvals, business development costs and expanded operational infrastructure.

Interest Income and Interest Expense

Interest income consists of interest earned on our cash and cash equivalents. Interest expense consists of interest incurred on equipment debt financing.

Other Income

Other income consists of sublease income from space we are not currently occupying.

Results of Operations

Comparison of Years Ended December 31, 2006 and December 31, 2005

Collaborative Research and Development Revenue

Collaborative research and development revenues decreased by $374,000, or 4%, to $8.4 million for the year ended December 31, 2006 from $8.8 million for the year ended December 31, 2005. This decrease reflects a decrease of approximately $2.8 million in connection with our collaboration with Abbott, which concluded on December 31, 2005, partially offset by an increase of approximately $2.4 million in connection with our collaboration with McNeil for the further clinical development of senicapoc.

Research and Development Expense

Research and development expense increased by $2.9 million, or 11%, to $28.8 million for the year ended December 31, 2006 from $25.9 million for the year ended December 31, 2005. The increase was due primarily to an increase of $3.2 million related to the development of senicapoc for the treatment of sickle cell disease, an increase of $418,000 related to stock-based compensation, an increase of $223,000 in expense related to

pharmacology studies and expense related to our inflammation and other pain studies, an increase of $149,000 in salary and benefits expense, and an increase of $110,000 related to relocation and recruiting expenses, partially offset by a decrease of $550,000 in expense related to our lead compounds for epilepsy and neuropathic pain, a decrease of $247,000 in patent expense, a decrease of $186,000 in depreciation expense and a decrease of $143,000 in expenses for laboratory supplies.

General and Administrative Expense

General and administrative expense increased by $1.3 million, or 29%, to $5.9 million for the year ended December 31, 2006 from $4.6 million for the year ended December 31, 2005. The increase was due primarily to an increase of $735,000 in stock-based compensation expense, an increase of $343,000 in salary and benefits expense, an increase of $287,000 in pre-commercialization expenses for senicapoc, and an increase of $109,000 in legal expenses, partially offset by a decrease of $172,000 in fees for consulting and professional services primarily related to consulting fees incurred in preparing for Sarbanes-Oxley regulatory compliance in 2005.

Interest Income and Interest Expense

Interest income increased $100,000, or 6%, to $1.7 million for the year ended December 31, 2006 from $1.6 million for the year ended December 31, 2005. The increase in interest income was attributable to increased interest rates.

Interest expense increased $36,000, or 20%, to $213,000 for the year ended December 31, 2006 from $177,000 for the year ended December 31, 2005. The increase in interest expense was attributable to increased interest rates.

Comparison of Years Ended December 31, 2005 and December 31, 2004

Collaborative Research and Development Revenue

Collaborative research and development revenues increased by $2.3 million, or 35%, to $8.8 million for the year ended December 31, 2005 from $6.5 million for the year ended December 31, 2004. This increase reflects an increase of approximately $3.4 million due to increased revenues from our collaboration with McNeil for the further clinical development of senicapoc, which was initiated in June 2004, partially offset by a decrease of approximately $607,000 related to our collaboration with Abbott and a decrease of approximately $500,000 due to the recognition of a milestone payment from Astellas during 2004.

Research and Development Expense

Research and development expense increased by $5.5 million, or 27%, to $25.9 million for the year ended December 31, 2005 from $20.4 million for the year ended December 31, 2004. The increase was due primarily to an increase of $3.9 million related to the development of senicapoc for the treatment of sickle cell disease, an increase of $464,000 in salary and benefits expense due to normal annual increases in salary and benefits expense for existing employees and the addition of new employees, an increase of $283,000 related to the development of our lead compounds for the treatment of epilepsy and neuropathic pain, an increase of $244,000 in laboratory supplies expense, an increase of $199,000 in amortization of deferred compensation expense, an increase of $189,000 in outsourced chemistry expense, and an increase in the aggregate of $272,000 related to increases in consulting, patent and license fee expenses.

General and Administrative Expense

General and administrative expense increased by $1.5 million, or 51%, to $4.6 million for the year ended December 31, 2005 from $3.0 million for the year ended December 31, 2004. The increase was due primarily to an increase of $527,000 in insurance costs primarily related to directors' and officers' insurance, an increase of

$410,000 in fees for consulting and professional services primarily related to consulting fees incurred in preparing for Sarbanes Oxley regulatory compliance, an increase of $384,000 in salary and benefits expense due to normal annual increases in salary and benefits expense for existing employees, executive bonuses and the addition of new employees, an increase of $195,000 in accounting expenses and an increase in the aggregate of $246,000 related to increases in deferred compensation amortization, recruiting related expense, and tax expense, partially offset by a decrease of $296,000 in board of directors' expense primarily related to the 2004 extension of the term of certain options to purchase an aggregate of 40,000 shares of common stock issued to designees of one of our directors.

Interest Income and Interest Expense

Interest income increased $1.2 million, or 320%, to $1.6 million for the year ended December 31, 2005 from $384,000 for the year ended December 31, 2004. The increase in interest income was attributable to a higher average cash balance resulting from our IPO.

Interest expense remained relatively constant from 2005 to 2004, decreasing $1,000, or 1%, to $177,000 for the year ended December 31, 2005 from $178,000 for the year ended December 31, 2004.

Liquidity and Capital Resources

On February 8, 2005, we completed an IPO of 5,000,000 shares of our common stock at a price of $8.00 per share. On March 9, 2005, the underwriters purchased an additional 100,000 shares of common stock pursuant to an over-allotment option. Our net proceeds from the IPO, including the over-allotment option and after deducting underwriter's discounts and commissions and offering expenses, were approximately $35.3 million.

On February 6, 2007, we completed a private placement of 15,423,640 shares of our common stock and warrants to purchase 5,398,256 million shares of our common stock at an exercise price of $1.45 per share. The private placement resulted in gross proceeds to us of approximately $22.0 million.

We have financed our operations since inception through the issuance of equity securities, payments received under our collaboration agreements with McNeil, Bristol-Myers Squibb, Astellas and Abbott, proceeds from equipment debt financing and capital leases and interest income. From inception through December 31, 2006, we have raised net proceeds of $114.5 million from our IPO, private equity financings and the exercise of stock options. From inception through December 31, 2006, we have also received $71.3 million in license fees and research and development funding, $7.7 million in proceeds from equipment debt financing and capital leases and $9.3 million in interest income. To date, inflation has not had a material effect on our business.

Cash Flows

At December 31, 2006, our cash and cash equivalents were $25.1 million as compared to $47.8 million at December 31, 2005. Our cash and cash equivalents are highly liquid investments with a maturity of one year or less at date of purchase and consist of time deposits and investments in money market funds with commercial banks and financial institutions and United States government obligations.

Net cash used in operating activities was $22.1 million for the year ended December 31, 2006. This reflects a net loss of approximately $24.8 million, a decrease of approximately $1.1 million in deferred revenue, an increase of approximately $95,000 in prepaid expenses and other current and non-current assets, and a decrease of approximately $79,000 in accounts payable and accrued expenses. These amounts were partially offset by $2.5 million of non-cash expenses related to stock-based compensation, $901,000 of non-cash expenses related to depreciation and amortization of property and equipment, a decrease in accounts receivable of $292,000, and $185,000 of non-cash expenses for amortization of technology licenses.

Net cash used in investing activities in the year ended December 31, 2006 was $400,000 and consisted of purchases of property and equipment.

Net cash used in financing activities during the year ended December 31, 2006 was $132,000 and consisted primarily of $738,000 in principal repayments related to our equipment debt financing, partially offset by $335,000 in net proceeds from the exercise of stock options and $271,000 in proceeds from equipment debt financing.

Net cash used in operating activities was $17.2 million for the year ended December 31, 2005. This reflects a net loss of approximately $20.2 million, a decrease of approximately $906,000 in deferred revenue, and a decrease of approximately $116,000 in accounts payable and accrued expenses. These amounts were partially offset by $1.4 million of non-cash expenses related to amortization of deferred compensation charges, a decrease of approximately $1.2 million in prepaid expenses and other current and non-current assets primarily related to the costs incurred in 2004 in association with our IPO, $1.1 million of non-cash expenses related to depreciation and amortization of property and equipment, $258,000 of non-cash expenses for amortization and impairment of technology licenses and a decrease in accounts receivable of $201,000.

Net cash used in investing activities in the year ended December 31, 2005 was $821,000 and consisted of approximately $701,000 related to the purchase of property and equipment and $120,000 related to technology license agreements. In addition, during the year ended December 31, 2005, equipment totaling $635,000 was acquired through debt financing.

Net cash generated by financing activities during the year ended December 31, 2005 was $35.5 million and consisted primarily of $35.3 million in net proceeds from our IPO, $658,000 in proceeds from equipment debt financing, and $297,000 in net proceeds from the exercise of stock options and warrants, partially offset by $780,000 in principal repayments related to our equipment debt financing.

Off-Balance Sheet Arrangements

We do not have any off-balance sheet arrangements.

Contractual Obligations

Our long-term commitments under operating leases consist of payments relating to our leases of laboratory and office space as well as of office equipment. These leases expire over the period from 2008 to 2010. Our long-term commitments under equipment debt financing consist of payments relating to financing arrangements used primarily for the purchase of laboratory equipment.

We are a party to a number of license agreements, primarily with academic institutions, under which we license patents, patent applications and other intellectual property. The duration of these agreements varies from 10 years to the expiration date of the last-to-expire patent, and we have the option to renew some of these agreements at the end of their terms. Our technology license agreements are generally terminable by us upon short notice. Under some conditions, we are permitted to grant sublicenses for which the licensors are entitled to receive a fee, a share of sublicense income or both. Some of these licenses require annual technology license maintenance fees and periodic payments upon the achievement of specified development and regulatory milestones. We are obligated to pay specified royalties for licensed and sublicensed product sales, and in some cases minimum annual royalties. The table below does not include contingent milestone amounts payable pursuant to these license agreements.

One of our license agreements is with CMCC. Under this agreement, we are required to pay CMCC royalties on net product sales by us or our affiliates and a share of any sublicense income received by us. This sublicense income includes upfront and milestone payments, royalties and our share of profits in the copromotion territory under our collaboration agreement with McNeil. Pursuant to the McNeil collaboration agreement, we are responsible for all amounts due to CMCC other than in respect of our share of profits in the copromotion territory, which we and McNeil have agreed to share equally. See "Business—Intellectual Property—License

Agreements" above for a description of the CMCC license agreement. We paid CMCC $1.3 million of the $10.0 million upfront payment that we received from McNeil in June 2004, and $650,000 of the $5.0 million milestone payment that we received from McNeil upon acceptance of the protocol for our pivotal Phase III trial by the FDA in February 2005. The amount of payments or obligations to CMCC are recorded on the balance sheet as long-term assets under the category "technology licenses and related costs" and are amortized to expense over the term of the agreement.

The following table summarizes as of December 31, 2006 our contractual obligations for operating leases, equipment debt financing principal and interest payments, annual technology license maintenance fees, and other contractual obligations, including minimum annual royalties. This table should be read in conjunction with the notes accompanying our financial statements included elsewhere in this Annual Report on Form 10-K.

	Payments Due By Period						
	Total	2007	2008	2009	2010	2011	2012 and Thereafter
	(in thousands)						
Operating leases	$ 558	$ 342	$120	$ 62	$ 34	$—	$—
Equipment debt financing	1,608	746	545	280	37	—	—
Annual technology license maintenance fees	1,008	111	136	111	111	111	428
Other contractual obligations	626	626	—	—	—	—	—
Total	$3,800	$1,825	$801	$453	$182	$111	$428

Other contractual obligations as of December 31, 2006 consisted of $626,000 related to commitments for contract research services for preclinical research and other commitments.

Funding Requirements

We expect to incur losses from operations for at least the next several years. In particular, as described above, we expect to incur increasing research and development expense and general and administrative expense in the future.

We believe our existing cash and cash equivalents, including the gross proceeds of approximately $22.0 million from our private placement completed in February 2007 and funding by McNeil of its share of senicapoc development costs, will be sufficient to enable us to fund our operating expenses, obligations under our equipment debt financing and capital expenditure requirements for at least the next 18 months. Our future capital requirements will depend on many factors, including:

- the scope and results of our research, preclinical and clinical development activities;
- the timing of, and the costs involved in, obtaining regulatory approvals;
- the cost of commercialization activities, including product marketing, sales and distribution;
- the costs involved in preparing, filing, prosecuting, maintaining and enforcing patent claims and other patent-related costs, including litigation costs and the results of such litigation;
- the extent to which we acquire or invest in businesses, products and technologies;
- the success of our collaborations with McNeil, Bristol-Myers Squibb and Astellas; and
- our ability to establish and maintain additional collaborations.

We do not anticipate that we will generate product revenue before 2009 at the earliest. In the absence of additional funding, we expect our continuing operating losses to result in increases in our cash used in operations over the next several quarters and years. To the extent our capital resources are insufficient to meet future capital

requirements, we will need to finance future cash needs through public or private equity offerings, debt financings or corporate collaboration and licensing arrangements. Except for funding by McNeil of its share of senicapoc development costs, we do not currently have any commitments for future external funding.

Additional equity or debt financing, or corporate collaboration and licensing arrangements, may not be available on acceptable terms, if at all. If adequate funds are not available, we may be required to delay, reduce the scope of or eliminate our research and development programs, reduce our planned commercialization efforts, or obtain funds through arrangements with collaborators or others that may require us to relinquish rights to certain drug candidates that we might otherwise seek to develop or commercialize independently. Additionally, any future equity funding may dilute the ownership of our equity investors.

Recent Accounting Pronouncements

In September 2006, the FASB issued Statement of Financial Accounting Standards, or SFAS, No. 157, *Fair Value Measurements*, or SFAS 157. SFAS 157 defines fair value, establishes a framework for measuring fair value in accordance with accounting principles generally accepted in the United States, and expands disclosures about fair value measurements. The provisions of SFAS 157 are effective for fiscal years beginning after November 15, 2007. We are currently evaluating the impact, if any, of the provisions of SFAS 157.

In September 2006, the SEC issued Staff Accounting Bulletin No. 108, *Considering the Effects of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements*, or SAB 108. SAB 108 provides interpretive guidance on how the effects of the carryover or reversal of prior year misstatements should be considered in quantifying a current year misstatement. The SEC staff believes that registrants should quantify errors using both a balance sheet and an income statement approach and evaluate whether either approach results in a misstatement that, when all relevant quantitative and qualitative factors are considered, is material and therefore must be quantified. SAB 108 is effective for years ending on or after November 15, 2006. The adoption of SAB 108 did not have a material effect on our financial statements.

In July 2006, the FASB issued Interpretation No. 48, *Accounting for Uncertainty in Income Taxes, an interpretation of FASB Statement No. 109, Accounting for Income Taxes*, or FIN 48. FIN 48 prescribes a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. The evaluation of a tax position in accordance with FIN 48 is a two-step process. The first step is recognition: we determine whether it is more likely than not that a tax position will be sustained upon examination, including resolution of any related appeals or litigation processes, based on the technical merits of the position. In evaluating whether a tax position has met the more-likely-than-not recognition threshold, we must presume that the positions will be examined by the appropriate taxing authority that has full knowledge of all relevant information. The second step is measurement: a tax position that meets the more-likely-than-not recognition threshold is measured to determine the amount of benefit to recognize in the financial statements. The tax position is measured at the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement. Differences between tax positions taken in a tax return and amounts recognized in the financial statements will generally result in one of the following: an increase in a liability for income taxes payable or a reduction of an income tax refund receivable, a reduction in a deferred tax asset or an increase in a deferred tax liability, or a combination of each. We must recognize tax positions that previously failed to meet the more-likely-than-not recognition threshold in the first subsequent financial reporting period in which that threshold is met. We must de-recognize previously recognized tax positions that no longer meet the more-likely-than-not recognition threshold in the first subsequent financial reporting period in which that threshold is no longer met. We may not use a valuation allowance as a substitute for derecognition of tax positions. FIN 48 is effective for fiscal years beginning after December 15, 2006. We do not expect the adoption of FIN 48 to have a material impact on our financial condition or results of operations.

In May 2005, the FASB issued SFAS No. 154, *Accounting Changes and Error Corrections*, or SFAS 154, a replacement of Accounting Principles Board, or APB, Opinion No. 20, *Accounting Changes*, and SFAS No. 3,

Reporting Accounting Changes in Interim Financial Statements. SFAS 154 provides guidance on the accounting for and reporting of changes in accounting principles and error corrections. SFAS 154 applies to all voluntary changes in accounting principles and to changes required by an accounting pronouncement in the unusual instance that the pronouncement does not include specific transition provisions. SFAS 154 requires retrospective application to prior periods' financial statements of changes in accounting principles, unless it is impracticable to determine either the period-specific effects or the cumulative effect of the change. SFAS 154 is effective for accounting changes and corrections of errors made in fiscal years beginning after December 15, 2005. The adoption of SFAS 154 during the first quarter of fiscal 2006 did not impact our financial condition or results of operations.

In December 2004, the FASB issued Statement 123(R), which is a revision of FASB Statement No. 123, *Accounting for Stock-Based Compensation*, or Statement 123. Statement 123(R) supersedes APB Opinion No. 25, *Accounting for Stock Issued to Employees*, or APB 25, and amends FASB Statement No. 95, *Statement of Cash Flows*. Generally, the approach in Statement 123(R) is similar to the approach described in Statement 123. However, Statement 123(R) requires all share-based payments to employees, including grants of employee stock options, to be recognized in the income statement based on their fair values. Pro forma disclosure is no longer an alternative.

Statement 123(R) permits public companies to adopt its requirements using one of two methods: (1) a "modified prospective" method in which compensation cost is recognized beginning with the effective date (a) based on the requirements of Statement 123(R) for all share-based payments granted after the effective date and (b) based on the requirements of Statement 123 for all awards granted to employees prior to the effective date of Statement 123(R) that remain unvested on the effective date; or (2) a "modified retrospective" method which includes the requirements of the modified prospective method described above, but also permits entities to restate based on the amounts previously recognized under Statement 123 for purposes of pro forma disclosures either (a) all prior periods presented or (b) prior interim periods of the year of adoption.

We adopted this standard as of the beginning of our first quarter of 2006 using the modified prospective transition method. See "Note 7—Stock-Based Compensation" to our financial statements included elsewhere in this Annual Report on Form 10-K for a discussion regarding the impact of the adoption of Statement 123(R).

ITEM 7A—QUANTITATIVE AND QUALITATIVE DISCLOSURES ABOUT MARKET RISK

Our exposure to market risk is currently confined to our cash and cash equivalents that have maturities of less than one year. We currently do not hedge interest rate exposure. We have not used derivative financial instruments for speculation or trading purposes. Because of the short-term maturities of our cash and cash equivalents, we do not believe that an increase in market rates would have any significant impact on the realized value of our investments.

We have operated primarily in the United States and have received payments from our collaborators in United States dollars. Accordingly, we do not have any material exposure to foreign currency rate fluctuations.

ITEM 8—FINANCIAL STATEMENTS AND SUPPLEMENTARY DATA

See the index to our financial statements in Item 15 and the financial statements and notes that are filed as part of this Annual Report on Form 10-K following the signature page and incorporated herein by this reference.

ITEM 9—CHANGES IN AND DISAGREEMENTS WITH ACCOUNTANTS ON ACCOUNTING AND FINANCIAL DISCLOSURE

Not applicable.

ITEM 9A—CONTROLS AND PROCEDURES

Disclosure Controls and Procedures

Our management, with the participation of our chief executive officer and chief financial officer, evaluated the effectiveness of our disclosure controls and procedures as of December 31, 2006. The term "disclosure controls and procedures," as defined in Rules 13a-15(e) and 15d-15(e) under the Exchange Act, means controls and other procedures of a company that are designed to ensure that information required to be disclosed by us in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported, within the time periods specified in the SEC's rules and forms. Disclosure controls and procedures include, without limitation, controls and procedures designed to ensure that information required to be disclosed by a company in the reports that it files or submits under the Exchange Act is accumulated and communicated to the company's management, including its principal executive and principal financial officers, as appropriate to allow timely decisions regarding required disclosure. Management recognizes that any controls and procedures, no matter how well designed and operated, can provide only reasonable assurance of achieving their objectives and management necessarily applies its judgment in evaluating the cost-benefit relationship of possible controls and procedures. Based on the evaluation of our disclosure controls and procedures as of December 31, 2006, our chief executive officer and chief financial officer concluded that, as of such date, our disclosure controls and procedures were effective at the reasonable assurance level.

Management's Report on Internal Control over Financial Reporting

Our management is responsible for establishing and maintaining adequate internal control over financial reporting as defined in Rule 13a-15(f) or 15d –15(f) of the Exchange Act. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Our management assessed the effectiveness of the company's internal control over financial reporting as of December 31, 2006. In making this assessment, our management used the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission, or COSO, in Internal Control—Integrated Framework. Based on this assessment, management concluded that, as of December 31, 2006, our internal control over financial reporting is effective based on those criteria.

Our management's assessment of the effectiveness of our internal control over financial reporting as of December 31, 2006 has been audited by Ernst & Young LLP, an independent registered public accounting firm, as stated in their report which appears below.

Changes In Internal Control Over Financial Reporting

No change in our internal control over financial reporting occurred during the fiscal quarter ended December 31, 2006 that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of Icagen, Inc.

We have audited management's assessment, included in the accompanying Management's Report on Internal Control Over Financial Reporting, that Icagen, Inc. maintained effective internal control over financial reporting as of December 31, 2006, based on criteria established in Internal Control—Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (the COSO criteria). Icagen Inc.'s management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting. Our responsibility is to express an opinion on management's assessment and an opinion on the effectiveness of the company's internal control over financial reporting based on our audit.

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

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

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

In our opinion, management's assessment that Icagen, Inc. maintained effective internal control over financial reporting as of December 31, 2006, is fairly stated, in all material respects, based on the COSO criteria. Also, in our opinion, Icagen, Inc. maintained, in all material respects, effective internal control over financial reporting as of December 31, 2006, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the balance sheets of Icagen, Inc. as of December 31, 2006 and 2005, and the related statements of operations, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2006 of Icagen, Inc. and our report dated February 28, 2007 expressed an unqualified opinion thereon.

/s/ Ernst & Young LLP

Raleigh, North Carolina
February 28, 2007

ITEM 9B—OTHER INFORMATION

None.

PART III

ITEM 10—DIRECTORS, EXECUTIVE OFFICERS AND CORPORATE GOVERNANCE

The information required to be disclosed by this Item pursuant to Item 401 of Regulation S-K with respect to our executive officers is contained in Part I of this Annual Report on Form 10-K under the caption, "Executive Officers of the Registrant." The remaining information required to be disclosed by this Item pursuant to Item 401 of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Information About our Directors, Officers and 5% Stockholders" and is incorporated in this Annual Report on Form 10-K by reference.

The information required to be disclosed by this Item pursuant to Item 405 of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Section 16(a) Beneficial Ownership Reporting Compliance" and is incorporated in this Annual Report on Form 10-K by reference.

We have adopted a Code of Business Conduct and Ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller, or persons performing similar functions. The text of our Code of Business Conduct and Ethics is posted in the "Investors—Corporate Governance" section of our website, www.icagen.com. We intend to disclose on our website any amendments to, or waivers from, our Code of Business Conduct and Ethics that are required to be disclosed pursuant to the disclosure requirements of Item 5.05 of Form 8-K.

The information required to be disclosed by this Item pursuant to Item 407(c)(3), (d)(4) and (d)(5) of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Corporate Governance" and is incorporated in this Annual Report on Form 10-K by reference.

ITEM 11—EXECUTIVE COMPENSATION

The information required to be disclosed by this Item pursuant to Items 402 and 407(e)(4) and (e)(5) of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the captions "Compensation of our Directors and Executive Officers" and is incorporated in this Annual Report on Form 10-K by reference.

ITEM 12—SECURITY OWNERSHIP OF CERTAIN BENEFICIAL OWNERS AND MANAGEMENT AND RELATED STOCKHOLDER MATTERS

The information required to be disclosed by this Item pursuant to Item 403 of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Information About our Directors, Officers and 5% Stockholders—Security Ownership of Certain Beneficial Owners and Management" and is incorporated in this Annual Report on Form 10-K by reference.

The information required to be disclosed by this Item pursuant to Item 201(d) of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Compensation of our Directors and Executive Officers—Securities Authorized for Issuance Under our Equity Compensation Plans" and is incorporated in this Annual Report on Form 10-K by reference.

ITEM 13—CERTAIN RELATIONSHIPS AND RELATED TRANSACTIONS, AND DIRECTOR INDEPENDENCE

The information required to be disclosed by this Item pursuant to Item 404 of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the captions "Certain Relationships and Transactions with Related Persons" and "Compensation of our Directors and Executive Officers" and is incorporated in this Annual Report on Form 10-K by reference.

The information required to be disclosed by this Item pursuant to Item 407(a) of Regulation S-K is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Corporate Governance" and is incorporated in this Annual Report on Form 10-K by reference.

ITEM 14—PRINCIPAL ACCOUNTANT FEES AND SERVICES

The information required to be disclosed by this Item pursuant to Item 9(e) of Schedule 14A is contained in the proxy statement for our 2007 annual meeting of stockholders under the caption "Proposal 2—Ratification of the Appointment of Auditors" and is incorporated in this Annual Report on Form 10-K by reference.

PART IV

ITEM 15—EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) 1. *Index to Financial Statements*

The following financial statements of Icagen, Inc. are included in this report immediately following the signature page:

- Report of Independent Registered Public Accounting Firm
- Balance Sheets at December 31, 2006 and December 31, 2005
- Statements of Operations for the years ended December 31, 2006, December 31, 2005 and December 31, 2004
- Statements of Stockholders' Equity for the years ended December 31, 2006, December 31, 2005, and December 31, 2004
- Statements of Cash Flows for the years ended December 31, 2006, December 31, 2005 and December 31, 2004
- Notes to the Financial Statements

2. *Index to Financial Statement Schedules*

Financial statement schedules are omitted because they are either not required or the required information is provided in the consolidated financial statements or notes thereto.

3. *Index to Exhibits*

The exhibits filed herewith or incorporated by reference are set forth on the Exhibit Index attached hereto.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ICAGEN, INC.
(Registrant)

By: /s/ P. KAY WAGONER, PH.D.
P. Kay Wagoner, Ph.D.
Chief Executive Officer and President

Date: March 6, 2007

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Signature	Title	Date
/s/ P. KAY WAGONER, PH.D. **P. Kay Wagoner, Ph.D.**	Director, Chief Executive Officer and President (Principal Executive Officer)	March 6, 2007
/s/ RICHARD D. KATZ, M.D. **Richard D. Katz, M.D.**	Senior Vice President, Finance and Corporate Development and Chief Financial Officer (Principal Financial Officer and Principal Accounting Officer)	March 6, 2007
/s/ ANDRÉ L. LAMOTTE, SC.D. **André L. Lamotte, Sc.D.**	Director	March 6, 2007
/s/ ANTHONY B. EVNIN, PH.D. **Anthony B. Evnin, Ph.D.**	Director	March 6, 2007
/s/ CHARLES A. SANDERS, M.D. **Charles A. Sanders, M.D.**	Director	March 6, 2007
/s/ DENNIS B. GILLINGS, PH.D. **Dennis B. Gillings, Ph.D.**	Director	March 6, 2007
/s/ RICHARD G. MORRISON, PH.D. **Richard G. Morrison, Ph.D.**	Director	March 6, 2007
/s/ MARTIN A. SIMONETTI **Martin A. Simonetti**	Director	March 6, 2007
/s/ ADEOYE Y. OLUKOTUN, M.D. **Adeoye Y. Olukotun, M.D.**	Director	March 6, 2007

ICAGEN, INC.

INDEX TO FINANCIAL STATEMENTS

Report of Independent Registered Public Accounting Firm

The Board of Directors and Stockholders of Icagen, Inc.

We have audited the accompanying balance sheets of Icagen, Inc. as of December 31, 2006 and 2005, and the related statements of operations, stockholders' equity, and cash flows for each of the three years in the period ended December 31, 2006. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

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

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Icagen, Inc. at December 31, 2006 and 2005, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2006, in conformity with U.S. generally accepted accounting principles.

We also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the effectiveness of Icagen, Inc.'s internal control over financial reporting as of December 31, 2006, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 28, 2007 expressed an unqualified opinion thereon.

As discussed in Note 1 to the financial statements, effective January 1, 2006, the Company adopted the provisions of Statement of Financial Accounting Standards No. 123(R), "Share-Based Payment", to account for stock-based compensation.

/s/ Ernst & Young LLP

Raleigh, North Carolina
February 28, 2007

Icagen, Inc.

Balance Sheets

(in thousands, except share and per share data)

	December 31, 2006	December 31, 2005
Assets		
Current assets:		
Cash and cash equivalents	$ 25,131	$ 47,763
Accounts receivable	9	301
Prepaid expenses and other	912	1,027
Total current assets	26,052	49,091
Property and equipment, net	1,566	2,130
Technology licenses and related costs, net of accumulated amortization of $705 and $520 as of December 31, 2006 and 2005, respectively	2,183	2,368
Deposits and other	1,014	804
Total assets	$ 30,815	$ 54,393
Liabilities and stockholders' equity		
Current liabilities:		
Accounts payable	$ 1,919	$ 2,108
Accrued expenses	2,958	2,848
Current portion of deferred revenue	996	1,086
Current portion of equipment debt	608	655
Total current liabilities	6,481	6,697
Deferred revenue, less current portion	11,513	12,510
Equipment debt financing, less current portion	774	1,194
Total liabilities	18,768	20,401
Commitments and Contingencies		
Stockholders' equity:		
Common stock, $0.001 par value; 90,000,000 shares authorized at December 31, 2006 and December 31, 2005; 22,312,266 and 21,991,491 shares issued and outstanding at December 31, 2006 and 2005, respectively	22	22
Additional paid-in capital	112,765	112,883
Deferred compensation	—	(2,981)
Accumulated deficit	(100,740)	(75,932)
Total stockholders' equity	12,047	33,992
Total liabilities and stockholders' equity	$ 30,815	$ 54,393

See accompanying notes.

Icagen, Inc.

Statements of Operations
(in thousands, except share and per share data)

	Years ended December 31,		
	2006	2005	2004
Collaborative research and development revenues:			
Research and development fees (including related party research fees from Abbott Laboratories of $0, $2,768 and $3,375 in 2006, 2005 and 2004, respectively)	$ 1,953	$ 4,454	$ 4,643
Reimbursed research and development costs	6,467	4,340	1,851
Total collaborative research and development revenues	8,420	8,794	6,494
Operating expenses:			
Research and development (including related party expenses to Quintiles Transnational Corp. of $7,515, $4,586 and $2,197 in 2006, 2005 and 2004, respectively)	28,820	25,906	20,390
General and administrative	5,907	4,589	3,041
Total operating expenses	34,727	30,495	23,431
Loss from operations	(26,307)	(21,701)	(16,937)
Other income (expense):			
Interest income	1,712	1,612	384
Interest expense	(213)	(177)	(178)
Other income	—	17	8
Total other income, net	1,499	1,452	214
Loss before income taxes	(24,808)	(20,249)	(16,723)
Income taxes	—	—	—
Net loss	$ (24,808)	$ (20,249)	$ (16,723)
Basic and diluted net loss per share	$ (1.12)	$ (1.03)	$ (10.61)
Weighted average common shares outstanding—basic and diluted	22,219,662	19,636,848	1,575,923

See accompanying notes.

Icagen, Inc.

Statements of Stockholders' Equity
(in thousands, except share and per share data)

	Convertible Preferred Stock	Common Stock	Additional Paid-In Capital	Employee Stock Option Notes Receivable	Deferred Compensation	Accumulated Deficit	Total
Balance at December 31, 2003	$ 14	$ 1	$ 72,281	$(11)	$(1,228)	$ (38,960)	$ 32,097
Exercise of options for 190,993 common shares	—	1	592	(4)	—	—	589
Exercise of warrants for 93,333 Series B shares	—	—	140	—	—	—	140
Repayment of employee stock option notes receivable	—	—	—	15	—	—	15
Deferred compensation related to stock options	—	—	4,103	—	(4,103)	—	—
Amortization of deferred compensation	—	—	—	—	1,109	—	1,109
Net loss	—	—	—	—	—	(16,723)	(16,723)
Balance at December 31, 2004	14	2	77,116	—	(4,222)	(55,683)	17,227
Exercise of options and warrants for 413,978 common shares	—	1	296	—	—	—	297
Public sale of 5,100,000 shares of common stock at $8.00 per share, net of stock issuance costs	—	5	35,337	—	—	—	35,342
Conversion of preferred stock	(14)	14	—	—	—	—	—
Deferred compensation related to stock options and restricted stock units net of forfeitures	—	—	134	—	(134)	—	—
Amortization of deferred compensation	—	—	—	—	1,375	—	1,375
Net loss	—	—	—	—	—	(20,249)	(20,249)
Balance at December 31, 2005	—	22	112,883	—	(2,981)	(75,932)	33,992
Elimination of deferred compensation related to the adoption of SFAS 123R	—	—	(2,981)	—	2,981	—	—
Exercise of options for 320,775 common shares	—	—	335	—	—	—	335
Stock-based compensation expense	—	—	2,528	—	—	—	2,528
Net loss	—	—	—	—	—	(24,808)	(24,808)
Balance at December 31, 2006	—	$ 22	$112,765	—	—	$(100,740)	$ 12,047

See accompanying notes.

Icagen, Inc.

Statements of Cash Flows
(in thousands)

	Years ended December 31,		
	2006	2005	2004
Operating activities			
Net loss	$(24,808)	$(20,249)	$(16,723)
Adjustments to reconcile net loss to net cash used in operating activities:			
Depreciation and amortization of property and equipment	901	1,074	1,098
Amortization of technology licenses and related costs	185	184	117
Stock-based compensation	2,528	1,375	1,109
Loss on the disposal of equipment	63	38	21
Write-off of technology licenses and related costs	—	74	—
Changes in operating assets and liabilities:			
Accounts receivable	292	201	(436)
Prepaid expenses and other current and non-current assets	(95)	1,175	(1,645)
Accounts payable and accrued expenses	(79)	(116)	2,461
Deferred revenue	(1,087)	(906)	13,745
Net cash used in operating activities	(22,100)	(17,150)	(253)
Investing activities			
Acquisition of property and equipment	(400)	(701)	(888)
Purchase of technology licenses and related costs	—	(120)	(1,324)
Net cash used in investing activities	(400)	(821)	(2,212)
Financing activities			
Proceeds from sale of common stock, net of stock issuance costs	—	35,342	—
Proceeds from equipment debt financing	271	658	450
Payments on equipment debt financing	(738)	(780)	(946)
Proceeds from exercise of warrants and stock options	335	297	729
Repayment on employee stock option notes receivable	—	—	15
Net cash (used in) provided by financing activities	(132)	35,517	248
(Decrease) increase in cash and cash equivalents	(22,632)	17,546	(2,217)
Cash and cash equivalents at beginning of year	47,763	30,217	32,434
Cash and cash equivalents at end of year	$ 25,131	$ 47,763	$ 30,217
Supplemental disclosure of cash flow information			
Cash paid for interest	$ 196	$ 186	$ 178
Non-cash items			
Technology licenses and related costs in accounts payable	—	—	$ 650
Equipment acquired through debt financing	—	$ 635	—

See accompanying notes.

Icagen, Inc.

Notes to Financial Statements

December 31, 2006

1. Company Description and Significant Accounting Policies

Company Description

Icagen, Inc. ("Icagen" or the "Company") was incorporated in Delaware in November 1992. Icagen is a biopharmaceutical company focused on the discovery, development and commercialization of novel orally-administered small molecule drugs that modulate ion channel targets. The Company has identified multiple drug candidates that modulate ion channels. These drug candidates were developed internally or through collaborative research programs. The Company's four most advanced programs are for the treatment of sickle cell disease; epilepsy and neuropathic pain; atrial fibrillation; and dementia, including Alzheimer's disease and attention deficit/hyperactivity disorder. The Company is also conducting ongoing drug discovery programs focused on new therapeutics for pain disorders and inflammatory disorders.

Initial Public Offering

On February 8, 2005, the Company completed an initial public offering ("IPO") of 5,000,000 shares of its common stock at a price of $8.00 per share. On March 9, 2005, the underwriters purchased an additional 100,000 shares of common stock pursuant to an over-allotment option. The Company's net proceeds from the IPO, including the over-allotment option and after deducting underwriter's discounts and commissions and offering expenses, were approximately $35.3 million.

All outstanding shares of the Company's Series A, Series B, Series C, Series D, Series E, Series E-1, Series F, Series G, Series G-1 and Series H convertible preferred stock ("Preferred Stock") automatically converted into shares of common stock upon completion of the IPO. Series A, Series B, Series C, Series D, Series E, Series F and Series H convertible preferred stock converted at a ratio of one common share per preferred share. Series E-1 and Series G convertible preferred stock converted at a ratio of 1.13809 common shares per preferred share and Series G-1 convertible preferred stock ("Series G-1") converted at a ratio of 1.875 common shares per preferred share.

Of the aggregate net proceeds of approximately $35.3 million from the IPO, from February 3, 2005 through December 31, 2006, the Company used approximately $35.3 million for general corporate purposes, including clinical trials, research and development expenses, purchase of equipment, repayment of indebtedness, working capital and general and administrative expenses.

Revenue Recognition

The Company's collaboration agreements contain multiple elements, including non-refundable upfront license fees, payments for reimbursement of research and development costs, payments for ongoing research and development, payments associated with achieving development and regulatory milestones and royalties based on specified percentages of net product sales, if any. The Company applies the revenue recognition criteria outlined in Staff Accounting Bulletin ("SAB") No. 104, *Revenue Recognition* ("SAB 104") and Emerging Issues Task Force ("EITF") Issue 00-21, *Revenue Arrangements with Multiple Deliverables* ("EITF 00-21"). In applying these revenue recognition criteria, the Company considers a variety of factors in determining the appropriate method of revenue recognition under these arrangements, such as whether the elements are separable, whether there are determinable fair values and whether there is a unique earnings process associated with each element of a contract.

Cash received in advance of revenue recognition is recorded as deferred revenue and recognized as revenue as services are performed over the applicable term of the agreement. When the period of deferral cannot be

specifically identified from the agreement, the deferral period is estimated based upon other factors contained within the agreement. The Company continually reviews these estimates, which could result in a change in the deferral period and which might impact the timing and the amount of revenue recognized.

When a payment is specifically tied to a separate earnings process, revenues are recognized when the specific performance obligation associated with the payment is completed. Performance obligations typically consist of significant milestones in the development life cycle of the related program, such as the initiation or completion of clinical trials, filing for approval with regulatory agencies and receipt of approvals by regulatory agencies. Revenues from milestone payments may be considered separable from funding for research and development services because of the uncertainty surrounding the achievement of milestones for products in early stages of development. Accordingly, these payments could be recognized as revenue if and when the performance milestone is achieved if they represent a separate earnings process as described in EITF 00-21.

In connection with the Company's research and development collaborations with the McNeil Pediatrics Division (formerly McNeil Consumer & Specialty Division) of McNeil-PPC, Inc. ("McNeil"), a subsidiary of Johnson & Johnson, Bristol-Myers Squibb Company ("Bristol-Myers Squibb"), Astellas Pharma Inc., formerly Yamanouchi Pharmaceutical Co., Ltd. ("Astellas") and Abbott Laboratories ("Abbott"), revenues are recognized from non-refundable upfront license fees, which the Company does not believe are specifically tied to a separate earnings process, ratably over the term of the agreement. With respect to the Company's collaborations with Bristol-Myers Squibb, Astellas and Abbott, this period is the initial term of the research phase of the collaboration. With respect to the Company's collaboration with McNeil, this period is the estimated life of the agreement, which is through the expiration of the last-to-expire patent covered by the agreement in 2019. Research and development services provided under some of the Company's collaboration agreements are on a fixed fee basis. Revenues associated with long-term, fixed fee contracts are recognized based on the performance requirements of the agreements and as services are performed. The Company's collaboration agreements with Bristol-Myers Squibb, Astellas and Abbott allowed for research term extensions, and each term extension provided for additional research fees to be paid to the Company based on the level of effort and length of time associated with the services provided. Revenues are recognized from contract extensions as the extended services are performed.

Revenues derived from reimbursement of direct out-of-pocket expenses for research and development costs associated with one of the Company's research collaboration agreements and with the Company's cost sharing arrangement with McNeil are recorded in compliance with EITF Issue 99-19, *Reporting Revenue Gross as a Principal Versus Net as an Agent*, and EITF Issue 01-14, *Income Statement Characterization of Reimbursements Received for "Out-of-Pocket" Expenses Incurred*. According to the criteria established by these EITF Issues, in transactions where the Company acts as a principal, with discretion to choose suppliers, bears credit risk and performs part of the services required in the transaction, the Company records revenue for the gross amount of the reimbursement. The costs associated with these reimbursements are reflected as a component of research and development expense in the statements of operations.

None of the payments that the Company has received from collaborators to date, whether recognized as revenue or deferred, is refundable even if the related program is not successful.

Use of Estimates

The preparation of financial statements in conformity with accounting principles generally accepted in the United States requires management to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. Actual results could differ from those estimates.

Fair Value of Financial Instruments

The carrying values of cash and cash equivalents, accounts receivable and accounts payable approximate fair values at December 31, 2006 and 2005 based on the liquidity of these financial instruments or their short term nature. The carrying value of equipment debt financing approximates fair values at December 31, 2006 and 2005 based on the market interest rates available to the Company for debt of similar risk and maturities.

Cash and Cash Equivalents

The Company considers all highly liquid investments with a maturity of three months or less when purchased to be cash equivalents. Cash and cash equivalents consist of the following as of (in thousands):

	December 31,	
	2006	2005
Cash	$ 113	$ 342
Money market funds	25,018	47,421
Total	$25,131	$47,763

Property and Equipment

Property and equipment are stated at cost. Depreciation of equipment and furniture and fixtures is computed using the straight-line method over the estimated useful lives (ranging from 3 to 5 years) of the assets beginning when the assets are placed in service. Leasehold improvements are depreciated over the lesser of the estimated useful lives of the assets or the remaining lease terms. Depreciation and amortization recorded on property and equipment totaled $901,000, $1.1 million and $1.1 million for the years ended December 31, 2006, 2005 and 2004, respectively.

Technology Licenses and Related Costs

Technology licenses are capitalized and amortized over the lesser of the patent lives or terms of the related agreements (ranging from 10 to 20 years) using the straight-line method. The Company assesses the recoverability of its capitalized technology licenses and related costs by comparing the book value of the asset to the future net undiscounted cash flows expected to be generated by the asset.

During 2005, the Company identified certain technology licenses that no longer met its strategic objectives, which were determined to be unrecoverable and for which the Company had no alternative future uses. Accordingly, the Company recorded impairment losses for such agreements at the time of determination totaling $74,000 during the year ended December 31, 2005. These impairment losses are reflected as a component of research and development expense in the statements of operations. During the years ended December 31, 2006, 2005 and 2004, the Company recorded amortization of technology licenses and related costs of $185,000, $184,000 and $117,000, respectively. The weighted average amortization period of all technology licenses is 15.8 years. The Company estimates that future amortization of its technology licenses and related costs as of December 31, 2006 will be approximately $185,000 for each of the four years in the period ended December 31, 2010, approximately $182,000 in the year ended December 31, 2011, and an aggregate of $1.3 million thereafter.

Deposits and Other Assets

Deposits and other assets consist of utility and rent deposits and prepayments required under the terms of clinical trial contracts for which the remaining term of the clinical trial exceeds one year.

Long-Lived Assets

Long-lived assets are reviewed for impairment when events or changes in circumstances indicate the book value of the assets may not be recoverable. In accordance with Statement of Financial Accounting Standards ("SFAS") No. 144, *Accounting for the Impairment or Disposal of Long-Lived Assets*, recoverability is measured by comparing the book value of the asset to the future net undiscounted cash flows expected to be generated by the asset. If such an asset is considered to be impaired, the impairment to be recognized is calculated using the amount by which the book value of the asset exceeds the projected discounted future net cash flows arising from the asset.

Accrued Expenses

The Company records all expenses in the period incurred. In addition to recording expenses for invoices received, the Company estimates the cost of services provided by third parties or materials purchased for which no invoices have been received as of each balance sheet date. Accrued expenses as of December 31, 2006 and 2005 consist primarily of development and clinical trial expenses payable to contract research organizations in connection with the Company's research and development programs.

Significant Concentrations and Credit Risk

Financial instruments that potentially subject the Company to a concentration of credit risk consist of cash and cash equivalents and accounts receivable. The Company maintains its cash and cash equivalents in accounts with three major financial institutions in the United States. Substantially all deposits in these institutions exceeded the amount of FDIC insurance provided on such deposits at December 31, 2006 and 2005. Concentrations of credit risk with respect to accounts receivable, which are unsecured, are limited due to the strong financial position of the Company's collaborators.

The Company operates in a single industry and is engaged in discovering drugs that may lead to treatments for disabling and life-threatening diseases. Collaborative research revenues from the Company's collaboration partners representing 10% or more of total collaborative research revenues are as follows:

	Years ended December 31,		
	2006	2005	2004
McNeil	100%	69%	40%
Astellas	—	—	8%
Abbott	—	31%	52%

Additionally, substantially all of the Company's accounts receivable were due from McNeil at December 31, 2005.

Research and Development Costs

The Company expenses research and development costs as incurred. Research and development expense includes, among other items, clinical trial costs. The Company accounts for its clinical trial costs by estimating the total cost to treat a patient in each clinical trial and recognizing this cost, based on a variety of factors, beginning with the preparation for the clinical trial. This estimated cost includes payments to contract research organizations for trial site and patient-related costs, including laboratory costs related to the conduct of the trial, and other costs. The cost per patient varies based on the type of clinical trial, the site of the clinical trial and the length of the treatment period for each patient.

Income Taxes

The Company accounts for income taxes using the liability method in accordance with the provisions of SFAS No. 109, *Accounting for Income Taxes*. Under this method, deferred tax assets and liabilities are determined based on differences between the financial reporting and tax basis of the Company's assets and liabilities and are estimated using enacted tax rates and laws that will be in effect when the differences are expected to reverse. A valuation allowance is provided when the Company determines that it is more likely than not that some portion or all of a deferred tax asset will not be realized.

Comprehensive Loss

The Company has adopted the provisions of SFAS No. 130, *Comprehensive Income*, which establishes standards for the reporting and display of comprehensive income and its components for general purpose financial statements. For all periods presented, there were no differences between net loss and comprehensive loss.

Net Loss Per Share Attributable to Common Stockholders

The Company computes net loss per share attributable to common stockholders in accordance with SFAS No. 128, *Earnings Per Share* ("SFAS 128"). Under the provisions of SFAS 128, basic net loss per share attributable to common stockholders ("Basic EPS") is computed by dividing net loss attributable to common stockholders by the weighted average number of common shares outstanding. Diluted net loss per share attributable to common stockholders ("Diluted EPS") is computed by dividing net loss attributable to common stockholders by the weighted average number of common shares and dilutive common share equivalents then outstanding. Common share equivalents consist of the incremental common shares issuable upon the conversion of preferred stock, shares issuable upon the exercise of stock options, shares issuable upon the vesting of restricted stock units and shares issuable upon the exercise of warrants. For the periods presented, Diluted EPS is identical to Basic EPS because common share equivalents, including all of the Company's Preferred Stock, outstanding stock options, outstanding restricted stock units and outstanding warrants, are excluded from the calculation, as their effect is antidilutive. Had the Company been in a net income position, these securities may have been included in the calculation. These potentially dilutive securities consist of the following on a weighted average basis:

	Years ended December 31,		
	2006	2005	2004
Convertible preferred stock	—	1,564,340	14,737,238
Outstanding common stock options	4,039,258	3,638,105	3,271,395
Restricted stock units	180,480	203	—
Outstanding warrants	—	24,877	111,271
Total	4,219,738	5,227,525	18,119,904

Stock-Based Compensation

Prior to January 1, 2006, the Company accounted for stock option grants in accordance with Accounting Principles Board Opinion No. 25, *Accounting for Stock Issued to Employees* ("APB 25"), and related Interpretations, as permitted by Financial Accounting Standards Board ("FASB") Statement No. 123, *Accounting for Stock-Based Compensation* ("Statement 123"). Under APB 25, when the exercise price of the Company's stock options equals or exceeds the fair market value of the underlying common stock on the date of grant, no compensation expense is recognized. For stock options granted with an exercise price less than the fair value of the underlying common stock on the date of grant, the Company recorded deferred compensation for the difference between the exercise price and the deemed fair value of the Company's common stock on such date. Deferred compensation was amortized through December 31, 2005 on a straight-line basis over the related option vesting periods, which range from 12 to 48 months. Effective January 1, 2006, the Company adopted the fair value recognition provisions of FASB Statement No. 123 (revised 2004), *Share-Based Payment* ("Statement 123(R)"), using the modified prospective transition method. Under this method, compensation cost recognized includes compensation costs for all share-based payments granted prior to, but not yet vested as of December 31, 2005, based on the grant date fair value estimated in accordance with the original provisions of Statement 123, and compensation costs for all share-based payments granted subsequent to December 31, 2005, based on the grant date fair value estimated in accordance with the provisions of Statement 123(R). Results for prior periods have not been restated.

In December 2004, the FASB issued Statement 123(R), which is a revision of Statement 123. Statement 123(R) supersedes APB 25, and amends FASB Statement No. 95, *Statement of Cash Flows*. Generally, the approach in Statement 123(R) is similar to the approach described in Statement 123. However, Statement 123(R) requires all share-based payments to employees, including grants of employee stock options, to be recognized in the income statement based on their fair values. Pro forma disclosure is no longer an alternative.

Statement 123(R) permits public companies to adopt its requirements using one of two methods: (1) a "modified prospective" method in which compensation cost is recognized beginning with the effective date (a) based on the requirements of Statement 123(R) for all share-based payments granted after the effective date and (b) based on the requirements of Statement 123 for all awards granted to employees prior to the effective date of Statement 123(R) that remain unvested on the effective date; or (2) a "modified retrospective" method which includes the requirements of the modified prospective method described above, but also permits entities to restate based on the amounts previously recognized under Statement 123 for purposes of pro forma disclosures either (a) all prior periods presented or (b) prior interim periods of the year of adoption.

The Company adopted this standard as of the beginning of the Company's first quarter of 2006 using the modified prospective transition method. (See Note 7 for a discussion regarding the impact of the adoption of Statement 123(R).)

Segment Information

SFAS No. 131, *Disclosure About Segments of an Enterprise and Related Information*, establishes standards for the reporting of information about operating segments. Since its inception, the Company has conducted its operations in one operating segment.

The Company has derived its collaborative research revenues from contracts with collaborators in the following geographic locations (in thousands):

	Years ended December 31,		
	2006	2005	2004
United States	$8,420	$8,794	$5,993
Japan	—	—	501
Total collaborative research and development revenues	$8,420	$8,794	$6,494

Recent Accounting Pronouncements

In September 2006, the FASB issued SFAS No. 157, *Fair Value Measurements* ("SFAS 157"). SFAS 157 defines fair value, establishes a framework for measuring fair value in accordance with accounting principles generally accepted in the United States, and expands disclosures about fair value measurements. The provisions of SFAS 157 are effective for fiscal years beginning after November 15, 2007. The Company is currently evaluating the impact, if any, of the provisions of SFAS 157.

In September 2006, the Securities and Exchange Commission ("SEC") issued SAB No. 108, *Considering the Effects of Prior Year Misstatements when Quantifying Misstatements in Current Year Financial Statements* ("SAB 108"). SAB 108 provides interpretive guidance on how the effects of the carryover or reversal of prior year misstatements should be considered in quantifying a current year misstatement. The SEC staff believes that registrants should quantify errors using both a balance sheet and an income statement approach and evaluate whether either approach results in a misstatement that, when all relevant quantitative and qualitative factors are considered, is material and therefore must be quantified. SAB 108 is effective for years ending on or after November 15, 2006. The adoption of SAB 108 did not have a material effect on the Company's financial statements.

In July 2006, the FASB issued Interpretation No. 48, *Accounting for Uncertainty in Income Taxes, an interpretation of FASB Statement No. 109, Accounting for Income Taxes* ("FIN 48"). FIN 48 prescribes a recognition threshold and measurement attribute for the financial statement recognition and measurement of a tax position taken or expected to be taken in a tax return. The evaluation of a tax position in accordance with this Interpretation is a two-step process. The first step is recognition: the Company determines whether it is more likely than not that a tax position will be sustained upon examination, including resolution of any related appeals or litigation processes, based on the technical merits of the position. In evaluating whether a tax position has met the more-likely-than-not recognition threshold, the Company must presume that the positions will be examined by the appropriate taxing authority that has full knowledge of all relevant information. The second step is measurement: a tax position that meets the more-likely-than-not recognition threshold is measured to determine the amount of benefit to recognize in the financial statements. The tax position is measured at the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement. Differences between tax positions taken in a tax return and amounts recognized in the financial statements will generally result in one of the following: an increase in a liability for income taxes payable or a reduction of an income tax refund receivable, a reduction in a deferred tax asset or an increase in a deferred tax liability, or a combination of each. The Company must recognize tax positions that previously failed to meet the more-likely-than-not recognition threshold in the first subsequent financial reporting period in which that threshold is met. The Company must de-recognize previously recognized tax positions that no longer meet the more-likely-than-not recognition threshold in the first subsequent financial reporting period in which that threshold is no longer met. The Company may not use a valuation allowance as a substitute for derecognition of tax positions. FIN 48 is effective

for fiscal years beginning after December 15, 2006. The Company does not expect the adoption of FIN 48 to have a material impact on its financial condition or results of operations.

In May 2005, the FASB issued SFAS No. 154, *Accounting Changes and Error Corrections* ("SFAS 154"), a replacement of APB Opinion No. 20, *Accounting Changes,* and SFAS No. 3, *Reporting Accounting Changes in Interim Financial Statements.* SFAS 154 provides guidance on the accounting for and reporting of changes in accounting principles and error corrections. SFAS 154 applies to all voluntary changes in accounting principles and to changes required by an accounting pronouncement in the unusual instance that the pronouncement does not include specific transition provisions. SFAS 154 requires retrospective application to prior periods' financial statements of changes in accounting principles, unless it is impracticable to determine either the period-specific effects or the cumulative effect of the change. SFAS 154 is effective for accounting changes and corrections of errors made in fiscal years beginning after December 15, 2005. The adoption of SFAS 154 during the first quarter of 2006 did not impact the Company's financial condition or results of operations.

2. Collaborations

The Company has entered into research collaboration agreements with McNeil, Bristol-Myers Squibb, Astellas and Abbott to extend the Company's ion channel drug discovery technology into additional therapeutic areas and to benefit from the research, development and commercialization capabilities of the Company's collaborators, as well as to augment the Company's financial resources. A non-refundable upfront license fee was paid by each collaborator for rights to certain of the Company's technology. These collaborative research agreements also provide for periodic payments to support the research phase of such programs and payments upon completion of specified development and regulatory milestones. The Company may also receive reimbursement for certain research costs and royalty payments under these agreements based on specified percentages of net product sales, if any. In conjunction with the Company's collaborative research agreement with Abbott, Abbott purchased 1,191,300 shares of the Company's Series E convertible preferred stock and 400,000 shares of the Company's Series E-1 convertible preferred stock (See Note 6). The research phase of the Company's collaboration agreements with Bristol-Myers Squibb and Astellas concluded on September 30, 2003 and December 31, 2003, respectively, and the Company's collaboration with Abbott concluded on December 31, 2005.

In connection with the Company's collaboration with Astellas, Astellas selected a compound with potential application in the treatment of dementia, including Alzheimer's disease, for advanced preclinical studies during the fourth quarter of 2004. The selection of this compound resulted in the achievement of a milestone and the recognition of $500,000 of revenue which was recorded in accounts receivable at December 31, 2004. The Company recognized the full amount of this milestone payment as revenue during the quarter in which the milestone was achieved, in accordance with SAB 104, EITF 00-21 and other relevant accounting literature. The Company received payment for this milestone in January 2005.

On June 14, 2004, the Company entered into collaboration and copromotion agreements with McNeil to develop and commercialize senicapoc for the treatment of sickle cell disease. Pursuant to the collaboration arrangement, McNeil paid the Company an initial upfront payment of $10.0 million, $1.3 million of which the Company paid to Children's Medical Center Corporation ("CMCC"), and a milestone payment of $5.0 million upon acceptance by the U.S. Food and Drug Administration ("FDA") of the protocol for the Company's Phase III clinical trial of senicapoc, $650,000 of which the Company paid to CMCC in February 2005. The Company is recognizing these payments from McNeil as revenue in accordance with SAB 104, EITF 00-21 and other relevant accounting literature. Specifically, both the $10.0 million upfront payment and the $5.0 million milestone payment were recorded as deferred revenue, which is being amortized to revenue over the life of the agreement, which is estimated to be 15 years. At the time of the execution of the agreement, the achievement of the

milestone above was not considered to represent a separate earnings process, and therefore this payment was treated in a manner consistent with the accounting treatment applied to the $10.0 million upfront payment rather than recognized as revenue when received. McNeil is also potentially obligated to pay the Company up to an additional $48.0 million based on the achievement of specified clinical and regulatory milestones.

Under the terms of the agreements, the Company and McNeil agreed to copromote senicapoc in the United States and share equally in profits and losses from the commercialization of senicapoc in the United States. The Company is also entitled to copromote senicapoc with McNeil, at its option, in Canada. In calculating profits and losses in the copromotion territory, each party's sales force costs generally are excluded, since each party generally is required to provide 50% of the overall sales force efforts. Under the collaboration agreement, the Company granted McNeil a worldwide exclusive license to senicapoc and other compounds covered by a specific patent. McNeil is entitled, subject to specified rights retained by the Company, to commercialize senicapoc and the other licensed compounds outside the copromotion territory pursuant to this license and is required to pay the Company a royalty on net product sales.

The Company and McNeil have agreed to fund equally the ongoing development costs incurred pursuant to an agreed upon development plan for senicapoc in the copromotion territory for sickle cell disease. McNeil is required to fund all development costs outside of the copromotion territory. The Company records revenue from reimbursed research and development costs for development expenses outside of the copromotion territory based on the actual percentage of patients enrolled at clinical trial sites outside the copromotion territory.

Under the Company's license agreement with CMCC, the Company is required to pay CMCC royalties on net product sales by the Company or the Company's affiliates and a share of any sublicense income received by the Company. This sublicense income includes upfront and milestone payments, royalties and the Company's share of profits in the copromotion territory under the Company's collaboration agreement with McNeil. Pursuant to the McNeil collaboration agreement, the Company is responsible for all amounts due to CMCC other than in respect of the Company's share of profits in the copromotion territory, which the Company and McNeil have agreed to share equally.

The Company and McNeil are entitled to terminate the collaboration and copromotion agreements under specified conditions. In addition, if specified changes in control of the Company occur involving a list of five specified large pharmaceutical and biotechnology companies, McNeil is permitted to terminate the copromotion agreement and the Company's governance rights under the collaboration agreement and, in such event, the Company's right to receive a share of profits and losses in the copromotion territory is converted into a right to receive a royalty on net product sales.

3. Property and Equipment, Net

Property and equipment, net consists of the following (in thousands):

	December 31,	
	2006	2005
Equipment	$ 6,867	$ 6,752
Leasehold improvements	1,304	1,313
Furniture and fixtures	316	281
	8,487	8,346
Less: accumulated depreciation and amortization	(6,921)	(6,216)
Property and equipment, net	$ 1,566	$ 2,130

During the year ended December 31, 2005, $2.1 million of fully depreciated assets were written off.

4. Accrued Expenses

Accrued expenses consist of the following (in thousands):

	December 31,	
	2006	2005
Accrued development and clinical trial expenses	$2,693	$2,617
Other accrued expenses	265	231
Total accrued expenses	$2,958	$2,848

5. Commitments and Contingencies

The Company's obligations consist of equipment debt financing, noncancelable operating leases, technology licenses, other contractual obligations and employment arrangements.

Equipment Debt Financing

In July 1999, the Company entered into an equipment financing agreement, which was subsequently amended to provide for the acquisition of up to $3.7 million in equipment and other fixed assets. The financing agreement carries an interest rate indexed to the average yields on four-year U.S. Treasury Notes, as published by the Dow Jones Telerate Access Service, and requires repayment of principal and interest over 36 to 48 months with a final maturity of 2010. The applicable interest rates through December 31, 2006 ranged from 11.13% to 13.35%. This financing is structured as individual equipment notes, secured by the assets financed under such notes, and does not allow additional asset purchases under this financing beyond December 2006. As of December 31, 2006 and 2005, approximately $1.4 million and $1.8 million of the equipment debt financing were outstanding, respectively. Total equipment with a net carrying value of $1.4 million collaterizes the outstanding equipment debt financing balance at December 31, 2006.

Property and equipment includes the following amounts financed through equipment debt financing (in thousands):

	December 31,	
	2006	2005
Equipment, furniture and fixtures	$ 2,740	$ 2,873
Less: accumulated depreciation	(1,387)	(1,073)
	$ 1,353	$ 1,800

As of December 31, 2006, future annual principal payments under equipment debt financing consist of the following for the years ending December 31 (in thousands):

	Equipment Debt Financing
2007	$ 608
2008	477
2009	262
2010	35
Total	1,382
Current portion of equipment debt financing	(608)
Equipment debt financing, less current portion	$ 774

Noncancelable Operating Leases

The Company leases certain office equipment under noncancelable operating leases expiring in 2009. The Company leases its facilities under various noncancelable operating leases that expire from 2008 through 2010.

As of December 31, 2006, future annual minimum payments under noncancelable operating leases with terms in excess of one year consist of the following for the years ending December 31 (in thousands):

	Operating Leases
2007	$342
2008	120
2009	62
2010	34
Total minimum lease payments	$558

Rental expense associated with operating leases was $423,000, $440,000, and $448,000 for the years ended December 31, 2006, 2005 and 2004, respectively.

Technology Licenses

The Company is a party to a number of license agreements, primarily with academic institutions, under which it licenses patents, patent applications and other intellectual property for which the Company paid upfront license fees. The duration of these agreements varies from 10 years to the expiration date of the last-to-expire patent, and the Company has the option to renew some of these agreements at the end of their terms. The Company's technology license agreements are generally terminable by the Company upon short notice. Under certain conditions, the Company can grant sublicenses for which the licensors receive a fee. Some of these licenses require annual maintenance fees and periodic payments upon the achievement of specified development and regulatory milestones. The Company is obligated to pay specified royalties for licensed and sublicensed product sales or specified percentages of income received from sublicenses, and in some cases minimum annual royalties. As of December 31, 2006 and 2005, there were no milestone payments or royalties due under these technology license agreements.

In February 2000, the Company entered into an agreement with CMCC for a worldwide exclusive license to products covered by the patent rights licensed from CMCC. The patent rights licensed to the Company by CMCC include patent rights directed to the use of specified classes of compounds for most fields of human and veterinary therapeutics and diagnostics, including the Company's most advanced drug candidate for the treatment of sickle cell disease. The Company has the right to grant sublicenses under this license. Patents licensed under the CMCC agreement expire over the period from 2012 through 2016.

In exchange for the rights licensed from CMCC, the Company paid CMCC an upfront license fee and license maintenance fees aggregating $250,000. Under the Company's license agreement with CMCC, the Company is required to pay CMCC royalties on net product sales by the Company or the Company's affiliates. The Company is also required to make payments to CMCC aggregating up to an additional $250,000 based on achieving specified development and regulatory milestones with respect to each licensed product, which is not a sublicensed product. The Company is entitled to a credit for the development and regulatory milestone payments that it makes against the royalties that the Company would otherwise be obligated to pay of up to, but not more than, 50% of the royalties due in any given payment period. The Company is obligated to pay CMCC specified amounts with respect to any sublicense income received by the Company.

The Company also has a sponsored research agreement with CMCC. In the Company's sponsored research agreement with CMCC, CMCC granted the Company a right of first negotiation to obtain a worldwide exclusive license under patent rights resulting from the sponsored research. The Company's royalty obligation with respect to each licensed product extends until the expiration of the last-to-expire patent, which expires on September 16, 2014, licensed from CMCC covering the licensed products in any country. Upon the later of the expiration of the last-to-expire licensed patent or February 2015, the agreement expires.

Pursuant to its license with CMCC, the Company's obligation to pay CMCC specified amounts with respect to sublicense income applies to the upfront and milestone payments, royalties and share of profits in the copromotion territory received by the Company under the Company's collaboration agreement with McNeil. The Company paid CMCC $1.3 million of the $10.0 million upfront payment that the Company received from McNeil in June 2004, and paid CMCC $650,000 of the $5.0 million milestone payment that the Company received from McNeil upon acceptance of the protocol for the Company's pivotal Phase III clinical trial of senicapoc by the FDA. Payments or obligations to CMCC are recorded on the balance sheet as long-term assets under the category "technology licenses and related costs" and are amortized to expense over the term of the agreement.

As of December 31, 2006, future annual license maintenance fees under the Company's technology license agreements consist of the following for the years ending December 31 (in thousands):

	Annual License Maintenance Fees
2007	$ 111
2008	136
2009	111
2010	111
2011	111
2012 through 2024	428
Total	$1,008

The aggregate amount of the annual maintenance fees under these technology license agreements was $117,000, $121,000 and $87,000 in 2006, 2005 and 2004, respectively.

Other Contractual Obligations

Other contractual obligations as of December 31, 2006 consisted of $626,000 related to commitments for contract research services for preclinical research and other commitments.

Employment Arrangements

The Company provides a severance arrangement for certain of its executive officers and key employees, which includes salary continuance and continued health benefits. At December 31, 2006 and 2005, the Company had not incurred or recorded any obligation related to these arrangements.

6. Stockholders' Equity

Capital Structure

As of December 31, 2006 and 2005, the Company was authorized to issue up to 90,000,000 shares of $0.001 par value common stock and 10,000,000 shares of $0.001 par value preferred stock in one or more series.

Common Stock

On February 8, 2005, the Company completed an IPO of 5,000,000 shares of its common stock at a price of $8.00 per share. On March 9, 2005, the underwriters purchased an additional 100,000 shares of common stock pursuant to the over-allotment option. The Company's net proceeds from the IPO, including the over-allotment option and after deducting underwriter's discounts and commissions and offering expenses, were approximately $35.3 million.

As of December 31, 2006 and 2005, the Company had outstanding a total of 22,312,266 and 21,991,491 shares of common stock, respectively.

Convertible Preferred Stock

The following is a summary, as of December 31, 2004, of the rights, preferences and terms of the Company's outstanding series of Preferred Stock (in thousands, except share and per share data):

	Convertible Preferred Stock as of December 31, 2004						
	Initial Issuance	Shares Authorized	Shares Issued and Outstanding	Share Conversion Ratio	Common Shares Issuable Upon Conversion	Liquidation Price Per Share	Aggregate Liquidation Preference
Series A	March 1993	325,000	325,000	1 to 1	325,000	$ 1.00	$ 325
Series B	December 1994	1,500,000	1,229,540	1 to 1	1,229,540**	1.50	1,844
Series C	October 1995	2,173,914	1,521,442	1 to 1	1,521,442**	2.30	3,499
Series D	March 1997	2,125,849	2,065,049	1 to 1	2,065,049**	2.75	5,679
Series E.....	November 1997	1,229,041	825,000	1 to 1	825,000	4.85	4,001
	November 1999	*	396,825	1 to 1	396,825	8.19	3,250
Series E-1 ...	January 2001	400,000	400,000	15 to 13.18	455,235	15.00	6,000
Series F.....	August 1999	3,703,000	3,581,612	1 to 1	3,581,612	5.00	17,908
Series G	November 2000	1,125,000	176,657	15 to 13.18	201,046	15.00	2,650
Series G-1 ...	December 2003	1,125,000	948,343	15 to 8	1,778,143	15.00	14,225
Series H	December 2003	3,750,000	2,441,171	1 to 1	2,441,171	8.00	19,529
		17,456,804	13,910,639		14,820,063		$78,910

* Of the 1,229,041 shares authorized, 1,191,300 were authorized as of November 1997.

** In March 2004, holders of 298 shares of Series C and holders of 10,800 shares of Series D converted their preferred stock to common stock. In November 2004, holders of 93,333 warrants to purchase shares of Series B exercised those warrants.

Automatic Conversion

On February 8, 2005, the Company completed its IPO and all outstanding shares of the Company's Preferred Stock automatically converted into 14,820,063 shares of common stock.

Warrants

Warrants to purchase 26,307 shares of common stock were exercised on December 12, 2005. The exercise was cashless whereby shares of common stock received were reduced by the number of shares having an aggregate fair market value equal to the exercise price. The aggregate fair market value was based on the average closing price on each of the ten trading days prior to December 12, 2005, or $6.24 per share. Consequently, 12,287 shares of common stock were issued upon exercise.

Common Stock Reserved for Future Issuance

The Company had reserved shares of common stock for future issuance as follows:

	December 31, 2006
Outstanding stock options	4,867,335
Outstanding restricted stock units	192,932
Possible future issuance under the 2004 equity compensation plan	834,023
Total shares reserved	5,894,290

7. Stock-Based Compensation

In January 1996, the Board of Directors adopted and the stockholders approved the Icagen, Inc. Equity Compensation Plan (the "1996 Plan") to create an additional incentive for key employees, directors and consultants or advisors. The 1996 Plan authorized the issuance of stock options to be granted as incentive and nonqualified stock options, restricted stock, and other stock-based awards. The Board of Directors determined the exercise prices of all options granted. The options vest based on terms provided for in the individual stock option agreements issued pursuant to the 1996 Plan. Options generally vest on a monthly basis over a period of one to four years and have a contractual life of ten years.

In February 2004, the Board of Directors adopted and on May 19, 2004, the stockholders approved, the 2004 Stock Incentive Plan (the "2004 Plan"), which became effective on February 3, 2005, the date on which the Company's registration statement for its IPO was declared effective. The 2004 Plan provides for the grant of incentive stock options, non-statutory stock options, restricted stock awards and other stock-based awards. Upon effectiveness of the 2004 Plan, the number of shares of common stock reserved for issuance under the 2004 Plan was 3,080,892 shares. The 2004 Plan also contains a provision that allows for an automatic annual increase in the number of shares authorized under the 2004 Plan, beginning in 2006, subject to certain limitations specified in the 2004 Plan.

The fair value of each option award is estimated on the date of grant using the Black-Scholes-Merton option pricing model, using the assumptions noted in the following table. Expected volatility is based on the historical volatility of the Company's common stock price and the volatility of the common stock prices of other comparable companies in the biotechnology industry. The Company uses historical data to estimate option exercises and forfeitures used in the model. The expected term of options granted represents the period of time that options granted are expected to be outstanding. The Company analyzed separate groups of employees with similar exercise behavior to determine the expected term. The risk-free interest rate for periods within the contractual life of the option is based on the U.S. Treasury yield curve in effect at the time of grant. As of December 31, 2006, the Company had 4,867,335 options outstanding with a weighted average exercise price of $2.26, and 192,932 restricted stock units outstanding with a weighted average grant-date fair value of $6.25. Remaining compensation expense as of December 31, 2006 to be recognized on these options and restricted stock units through December 2010 is approximately $3.8 million and $808,000, respectively. The weighted-average period of time over which these costs will be recognized for stock options and restricted stock units is 2.3 and 3.0 years, respectively. As of December 31, 2006, the Company had 2,510,674 options exercisable with a weighted average exercise price of $2.44. As of December 31, 2006, the Company had 4,732,724 options vested and expected to vest with a weighted average exercise price of $2.30. The weighted-average contractual terms of the exercisable options and options vested and expected to vest at December 31, 2006 is 5.3 and 7.2 years, respectively. The aggregate intrinsic value of exercisable options and options vested and expected to vest at December 31, 2006 was $297,000 and $498,000, respectively.

The fair value of each option grant was determined using the Black-Scholes-Merton option pricing model with the following weighted average assumptions:

	Years ended December 31,		
	2006	2005	2004
Expected dividend yield	0.0%	0.0%	0.0%
Risk-free interest rate	4.8%	3.9%	2.7%
Expected volatility	60.0%	40.0%	40.0%
Expected life (in years)	4.8	2.5	2.5
Estimated weighted average grant date fair value per share of options granted	$1.60	$2.10	$4.25

As a result of adopting Statement 123(R), the Company's loss before income taxes and net loss for the year ended December 31, 2006 was $900,000 greater than if the Company had continued to account for stock-based compensation under APB 25. Basic and diluted loss per share for the year ended December 31, 2006 would have been $0.04 lower if the Company had not adopted Statement 123(R). For the year ended December 31, 2006, net cash used in operating activities and net cash provided by financing activities were unchanged since there were no excess tax benefits from equity-based compensation plans.

The following table illustrates the effect on net loss and net loss per share if the Company had applied the fair value recognition provisions of Statement 123 to options granted under the Company's stock option plans for the years ended December 31, 2005 and 2004. For purposes of this pro forma disclosure, the value of the options is estimated using the Black-Scholes-Merton option pricing model and amortized to expense over the options' vesting periods.

	Years Ended December 31,	
	2005	2004
Net loss, as reported	$(20,249)	$(16,723)
Add: stock-based compensation included in net loss	1,375	1,109
Deduct: stock-based compensation assuming Statement 123 fair value method was applied to all stock option awards	(1,686)	(1,116)
Pro forma net loss, as required by Statement 123	$(20,560)	$(16,730)
Basic and diluted net loss per share, as reported	$ (1.03)	$ (10.61)
Pro forma basic and diluted net loss per share, as required by Statement 123	$ (1.05)	$ (10.62)

The following table summarizes activity related to stock options and restricted stock units as of December 31, 2006, and changes during the year then ended:

	Shares Available for Grant	Stock Options Outstanding	Weighted Average Exercise Price	Restricted Stock Units Outstanding	Weighted Average Grant Date Fair Market Value
Balance at December 31, 2005	2,496,883	3,680,775	$3.12	37,407	$6.45
Granted	(2,433,925)	2,265,950	1.88	167,975	6.20
Exercised	—	(320,775)	1.05	—	—
Forfeited/Cancelled	771,065	(758,615)	5.76	(12,450)	6.30
Balance at December 31, 2006	834,023	4,867,335	$2.26	192,932	$6.25

In October 2004, the Company extended the term of certain options to purchase an aggregate of 40,000 shares of common stock issued to designees of one of its directors through October 15, 2004, which options were exercised on October 15, 2004. The Company recorded approximately $389,000 related to the intrinsic value of these options as general and administrative expense in October 2004 and accounted for this extension as a forfeiture in 2002 and a reissuance of these options in 2004. In the table above, these 40,000 options do not impact the shares available for grant under the 1996 Plan because this was an extension of previously granted options.

In December 2005, the Company amended the terms of certain stock option agreements resulting in an increase in the exercise price. Employees affected by these amendments were also granted an aggregate of 37,407 restricted stock units. The restricted stock units were issued with a fair market value of $6.45, the market

price of the Company's common stock at the date of grant. Accordingly, the Company recorded $241,000 of deferred compensation. The restricted stock units require no payment from the employee. Compensation cost is recorded based upon the market price on the grant date and is amortized ratably over the vesting period.

On September 27, 2006, the Compensation Committee of the Board of Directors approved an employee retention program with the objective of revitalizing the incentive value of the stock options held by the Company's employees. The employee retention program was comprised of two components: stock option grants to Company employees holding outstanding stock options having an exercise price of $2.00 or greater (the "Retention Grant Program"), and offers to eligible Company management employees, whereby such employees could surrender certain outstanding stock options (the "Old Options") issued under the 2004 Stock Plan in exchange for a reduced number of new options (the "New Options") (the "Option Exchange Program").

Pursuant to the Retention Grant Program, the Company granted to substantially all employees, including the Company's executive officers, additional stock options for common stock equivalent to two shares of common stock for every three shares of common stock covered by certain outstanding options having an exercise price of $2.00 or greater, with the number of shares issuable upon exercise of each new option rounded to the nearest share. The new options were granted at the exercise price of $0.87, equal to the closing price of the Company's common stock on the Nasdaq Global Market on September 27, 2006, the date on which the options were granted.

Pursuant to the Option Exchange Program, the Company offered each eligible management employee, including the Company's executive officers, the opportunity to exchange Old Options for New Options at a rate of two shares of common stock for every three shares issuable upon the exercise of an Old Option, rounded to the nearest share. Old Options eligible for the Option Exchange Program were excluded from the Retention Grant Program. The Company granted New Options at the exercise price of $0.90, equal to the closing price of the Company's common stock on the Nasdaq Global Market on September 28, 2006, the date on which the eligible management employees elected to exchange their options and the New Options were granted.

Pursuant to the Retention Grant Program and the Option Exchange Program, the Compensation Committee authorized the grant of stock options for the purchase of up to approximately 1,800,000 shares of the Company's common stock. After giving effect to the cancellation of certain stock options held by management employees for the purchase of approximately 650,000 shares of common stock pursuant to the Option Exchange Program, shares of the Company's common stock issuable pursuant to stock options increased by approximately 1,150,000 shares as a result of these programs.

All options granted pursuant to the Retention Grant Program and the Option Exchange Program were granted pursuant to the terms of the 2004 Plan, with each option vesting as to 25% of the shares covered thereby on the date that is six months after the grant date; an additional 25% of the shares on the date that is twelve months after the grant date; an additional 17% of the shares on the date that is eighteen months after the grant date; an additional 17% of the shares covered thereby on the date that is twenty-four months after the grant date; and the remaining 16% of the shares on the date that is thirty months after the grant date.

The awards granted under the Retention Grant Program were accounted for as new awards under Statement 123(R). The awards granted under the Option Exchange Program were accounted for as modifications under Statement 123(R) resulting in an incremental compensation cost of $147,000 which will be amortized to expense over the vesting period described above.

Selected information regarding stock options as of December 31, 2006 follows:

Options Outstanding				Options Exercisable	
Range of Exercise Prices	Number of Options	Weighted Average Remaining Life in Years	Weighted Average Exercise Price	Number of Options	Weighted Average Exercise Price
$0.23 – $0.34	94,648	1.2	$0.33	94,648	$0.33
0.35 – 0.75	621,973	3.4	0.63	621,973	0.63
0.76 – 2.25	3,121,905	7.9	1.42	1,280,961	2.13
2.26 – 5.00	411,508	7.5	4.91	241,012	4.94
5.01 – 6.50	408,996	8.2	6.28	199,096	6.28
6.51 – 8.00	157,167	8.5	7.18	56,597	7.15
8.01 – 9.12	51,138	8.7	8.78	16,387	8.78
$0.23 – $9.12	4,867,335	7.2	$2.26	2,510,674	$2.44

At December 31, 2006, the aggregate intrinsic value of options outstanding and options exercisable was $515,000 and $297,000, respectively. The intrinsic value of options exercised during the years ended December 31, 2006, 2005 and 2004 was $1,513,000, $2,485,000 and $664,000, respectively. The aggregate intrinsic value of restricted units outstanding at December 31, 2006 was $193,000. No restricted stock units vested during the year ended December 31, 2006. The total fair value of options vested during the years ended December 31, 2006, 2005 and 2004 was $2.0 million, $1.7 million and $1.1 million, respectively.

In January 2005, 33,750 options were issued at prices below the estimated fair market value of the underlying common stock on the date of grant (see Note 8). The weighted average fair market value of the underlying common stock related to these options was $10.00. The remaining 662,757 options granted during 2005 were issued at prices equal to the fair market value of the underlying common stock on the date of grant. The weighted average fair market value of the underlying common stock related to these options was $6.84.

During 2004, all options were issued at prices below the fair market value of the underlying common stock on the date of grant. The weighted average fair market value of the underlying common stock during 2004 was $9.47 (See Note 8).

At December 31, 2006 and 2005, 2,510,674 and 2,438,447 of the Company's outstanding options were exercisable, respectively.

8. Deferred Compensation

During the years ended December 31, 2005 and 2004, the Company recorded deferred compensation of $134,000 and $4.1 million, respectively, net of forfeitures, for stock options granted with exercise prices less than the fair value of the underlying common stock on the grant date or for restricted stock units granted. Prior to the January 1, 2006 adoption of Statement 123R, deferred compensation was amortized on a straight-line basis over the vesting period of the individual options and restricted stock units, ranging from 12 to 60 months. Amortization of deferred compensation amounted to $1.4 million and $1.1 million, during 2005 and 2004, respectively.

9. Related Party Transactions

At December 31, 2006 and 2005, Abbott was considered a principal owner as defined in SFAS No. 57, *Related Party Disclosures*. Abbott held 1,646,535 shares of the Company's common stock at December 31, 2006 and 2005. Research fees from Abbott totaled approximately $0, $2.8 million and $3.4 million in 2006, 2005 and 2004, respectively, including a non-refundable upfront license fee of $1.0 million in 2001 that was recognized as revenue ratably over the initial research term.

The Company incurred expense of $7.5 million, $4.6 million and $2.2 million from Quintiles Transnational Corp. for development and clinical trial services in 2006, 2005 and 2004, respectively. Quintiles Transnational Corp. is an affiliate of one of the Company's 5% stockholders, and the chairman of the board and chief executive officer of Quintiles Transnational Corp. is a stockholder and a member of the Company's Board of Directors. The amounts paid to Quintiles Transnational Corp. are included in research and development expense on the statements of operations. Amounts included in accounts payable related to these services totaled $301,000 and $320,000 at December 31, 2006 and 2005, respectively.

The Company incurred legal fees of approximately $45,000, $201,000 and $584,000 in 2006, 2005 and 2004, respectively, from a law firm, one of whose members is a stockholder. As of December 31, 2006 and 2005, $3,000 and $21,000 of the legal fees to this law firm were outstanding as accounts payable, respectively.

During 2002, the Company loaned $200,000 to one of its executive officers in connection with the executive's employment and relocation. The note bore interest at a fixed rate of 4.65% per annum and $40,000 of the principal balance plus accrued interest was forgiven annually through 2006. The Company recorded forgiveness of principal and accrued interest totaling $40,000, $42,000, and $45,000 as compensation expense for the years ended December 31, 2006, 2005 and 2004, respectively. The principal balance outstanding under this note totaled $0 and $40,000 at December 31, 2006 and 2005, respectively. The current portion of this note is included in prepaid expenses and other, and the long-term portion is included in deposits and other in the accompanying balance sheets.

10. Income Taxes

A reconciliation of the Company's income tax benefit at the federal statutory rate to actual income tax benefit is as follows (in thousands):

	2006	2005	2004
Income tax benefit at federal statutory rate	$ (8,683)	$ (7,087)	$(5,853)
State taxes, net of federal expense	(1,240)	(1,012)	(836)
Research and development credit	(460)	(459)	(417)
Orphan drug credit	(3,502)	(2,385)	(1,711)
Stock compensation	577	—	—
Deferred compensation	—	—	444
Other, net	139	77	13
Change in valuation allowance	13,169	10,866	8,360
	$ —	$ —	$ —

A reconciliation of the statutory income tax rate to the effective income tax rate as recognized in the statements of operations is as follows:

	2006	2005	2004
Federal statutory rate	35.0%	35.0%	35.0%
State tax rate, net of federal benefit	5.0%	5.0%	5.0%
Tax credits and non-deductible expenses	14.0%	14.0%	10.0%
Change in valuation allowance	(54.0)%	(54.0)%	(50.0)%
	0.0%	0.0%	0.0%

The income tax effects of temporary differences that give rise to significant portions of deferred tax assets are as follows as of December 31 (in thousands):

	2006	2005
Deferred tax assets:		
Deferred revenue	$ 5,004	$ 5,348
Excess book depreciation	261	253
Stock-based compensation expense	434	—
Net operating loss carryforwards	30,254	22,477
Research and development credit carryforwards	3,313	2,853
Orphan drug credit carryforward	19,372	13,984
Alternative minimum tax credit	5	5
Total deferred tax assets	58,643	44,920
Less: valuation allowance for deferred tax assets	(58,643)	(44,920)
Net deferred tax assets	$ —	$ —

At December 31, 2006 and 2005, the Company had net operating loss carryforwards of approximately $75.6 million and $56.2 million, respectively, and research and development credit carryforwards of approximately $3.3 million and $2.9 million, respectively, for income tax purposes that begin to expire in the year 2011. The Company's orphan drug credit carryforwards of $19.4 million and $14.0 million as of December 31, 2006 and 2005, respectively, for income tax purposes begin to expire in 2019. For financial reporting purposes, a valuation allowance has been recognized to offset the deferred tax assets related to these carryforwards as the Company has determined that it is more likely than not that the deferred tax assets will not be realized.

Based on the number of shares of common and preferred stock issued, the Company has exceeded the limit allowable under the Tax Reform Act of 1986 related to changes in ownership percentage governing future utilization of net operating loss carryforwards and tax credit carryforwards. Ownership changes subsequent to December 31, 2006 may reduce the availability of net operating losses to offset future taxable income.

11. Defined Contribution Benefit Plan

The Company has adopted a 401(k) plan (the "401(k) Plan") covering all qualified employees. The effective date of the 401(k) Plan is August 1, 1997. Participants may elect a salary reduction from 1% to 100% as a contribution to the 401(k) Plan subject to Internal Revenue Service limitations. The 401(k) Plan permits the Company to match these elective deferrals by a percentage determined on an annual basis. The Company matched 10% of participants' contributions in the amount of $61,000, $46,000 and $37,000 in 2006, 2005 and 2004, respectively.

12. Quarterly Results of Operations (Unaudited)

The following is a summary of the unaudited quarterly results of operations (in thousands, except share and per share amounts):

	Year ended December 31, 2006			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Collaborative research and development revenues	$ 1,882	$ 2,639	$ 2,157	$ 1,742
Loss from operations	(7,165)	(6,744)	(5,840)	(6,558)
Net loss attributable to common stockholders	(6,749)	(6,345)	(5,467)	(6,247)
Basic and diluted net loss per share attributable to common stockholders	$ (0.31)	$ (0.29)	$ (0.25)	$ (0.28)
Weighted average common shares outstanding—basic and diluted	22,092,491	22,192,838	22,277,996	22,312,266

	Year ended December 31, 2005			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Collaborative research and development revenues	$ 2,023	$ 1,738	$ 2,314	$ 2,719
Loss from operations	(5,548)	(5,229)	(5,204)	(5,720)
Net loss attributable to common stockholders	(5,311)	(4,855)	(4,790)	(5,293)
Basic and diluted net loss per share attributable to common stockholders	$ (0.40)	$ (0.22)	$ (0.22)	$ (0.24)
Weighted average common shares outstanding—basic and diluted	13,136,228	21,703,512	21,772,101	21,935,552

In accordance with prescribed reporting requirements, the sum of per share losses by quarter may not equal loss per share for the full year due to the changes in average share calculations.

13. Subsequent Events

On January 3, 2007, the Compensation Committee of the Board of Directors approved the issuance of 315,895 stock options to Company employees and directors with an exercise price of $1.08 per share, the market price on the date of grant, and the issuance of 56,755 restricted stock units to Company employees at a fair value of $1.08 per share, the market price of the common stock on the date of grant. The options vest monthly over a period of 36 to 48 months and the restricted stock units vest annually over a period of 4 years.

On January 12, 2007, the Compensation Committee of the Board of Directors approved the issuance of 99,300 stock options with an exercise price of $1.36 per share, the market price on the date of grant, and the issuance of 33,100 restricted stock units to Company executives at a fair value of $1.36 per share, the market price of the common stock on the date of grant. The options vest monthly over a period of 48 months and the restricted stock units vest annually over a period of 4 years.

On February 6, 2007, the Company completed a private placement in which 15.4 million shares of common stock and warrants to purchase an aggregate of 5.4 million additional shares of common stock with an exercise price of $1.45 per share were issued, together at a price of $1.42375 per share, resulting in gross proceeds of approximately $22 million. The proceeds from the private placement will be used for research and development and for other general corporate purposes.

EXHIBIT INDEX

Exhibit Number	Description
3.1(1)	Restated Certificate of Incorporation of the Registrant.
3.2(1)	Amended and Restated Bylaws of the Registrant.
4.1(2)	Specimen Stock Certificate.
4.2(2)	Amended and Restated Stockholders' Agreement, dated December 15, 2003, by and among the Registrant and the parties listed therein.
4.3(2)	Warrant to Purchase Shares of Series B Preferred Stock, dated December 28, 1994, issued to Dominion Fund III.
4.4(2)	Warrant to Purchase Shares of Series D Preferred Stock, dated May 23, 1997, issued to Dominion Fund III.
4.5(2)	Warrant to Purchase Shares of Series E Preferred Stock, dated September 3, 1998, issued to Dominion Fund III.
4.6(2)	First Amendment to Warrants to Purchase Shares of Preferred Stock of Icagen, Inc., dated May 14, 2004, by and between the Registrant, Dominion Fund III and Dominion Ventures.
4.7(2)	Form of Warrant to Purchase Shares of Series D Convertible Preferred Stock, dated March 15, 1997, issued to certain persons in connection with offering of series D preferred stock.
4.8(3)	Securities Purchase Agreement, dated January 26, 2007, among the Registrant and the purchasers listed on Exhibit A thereto.
4.9	Form of Warrant to Purchase Shares of Common Stock, dated February 6, 2007, issued to certain purchasers in connection with a private placement.
10.1*(2)	1996 Equity Compensation Plan, as amended.
10.2*(1)	2004 Stock Incentive Plan.
10.3*(4)	Form of Incentive Stock Option Agreement under the 2004 Stock Incentive Plan.
10.4*(4)	Form of Nonstatutory Stock Option Agreement under the 2004 Stock Incentive Plan.
10.4.1*(5)	Form of Nonstatutory Stock Option Agreement for Director Options under the 2004 Stock Incentive Plan.
10.4.2*(6)	Nonstatutory Stock Option Agreement, dated February 1, 2006, between the Registrant and Charles A. Sanders.
10.4.3*(7)	Form of Incentive Stock Option Agreement for the Retention Grant Program and Option Exchange Program under the 2004 Stock Incentive Plan.
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10.5.1*(6)	Restricted Stock Unit Agreement, dated February 1, 2006, between the Registrant and Richard D. Katz.
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Exhibit Number	Description
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10.13(10)	Sixth Amendment to Lease, dated August 3, 2005, by and between the Registrant and Royal Center IC, LLC.
10.14(2)	Lease Agreement, dated October 1997, between the Registrant and Royal Center IC, LLC, successor in interest to Petula Associates, LTD., as amended.
10.15(2)	Sublease Agreement, dated September 22, 1997, between the Registrant and Inspire Pharmaceuticals, Inc., as amended.
10.16(2)	Master Loan and Security Agreement, dated July 14, 1999, between the Registrant and Oxford Venture Finance, as amended.
10.17(11)	Letter Agreement, dated April 15, 2005, from Oxford Finance Corporation to the Registrant.
10.18(12)	Letter Agreement, dated February 14, 2006, from Oxford Finance Corporation to the Registrant.
10.19†(2)	Collaborative Research and License Agreement, dated March 21, 2000, between the Registrant and Astellas Pharma Inc., as amended.
10.20†(2)	Exclusive License Agreement, dated February 29, 2000, between the Registrant and Children's Medical Center Corporation, as amended.
10.21(2)	Clinical Trials Master Services Agreement, dated December 14, 1998, between the Registrant and Quintiles Transnational Corp.
10.22†(2)	Collaboration Agreement, dated June 14, 2004, between the Registrant and the McNeil Consumer & Specialty Pharmaceuticals Division of McNeil-PPC, Inc.
10.23†(2)	Copromotion Agreement, dated June 14, 2004, between the Registrant and the McNeil Consumer & Specialty Pharmaceuticals Division of McNeil-PPC, Inc.
23.1	Consent of Independent Registered Public Accounting Firm.
31.1	Certification of Chief Executive Officer and President pursuant to Exchange Act Rule 13a-14(a).
31.2	Certification of the Chief Financial Officer pursuant to Exchange Act Rule 13a-14(a).
32.1	Certification of Chief Executive Officer and President pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.
32.2	Certification of the Chief Financial Officer pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.

(1) Incorporated by reference to the exhibits to the Registrant's Annual Report on Form 10-K filed with the SEC on March 31, 2005.

(2) Incorporated by reference to the exhibits to the Registrant's Registration Statement on Form S-1 (File No. 333-114336).

(3) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on January 31, 2007.

(4) Incorporated by reference to the exhibits to the Registrant's Quarterly Report on Form 10-Q filed with the SEC on May 11, 2006.

(5) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on March 16, 2005.

(6) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on February 1, 2006.

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(8) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on January 19, 2007.

(9) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on May 30, 2006.

(10) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on August 9, 2005.

(11) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on April 19, 2005.

(12) Incorporated by reference to the exhibits to the Registrant's Current Report on Form 8-K filed with the SEC on February 21, 2006.

† Confidential treatment granted by the SEC as to certain portions.

* Management contract or compensatory plan or arrangement filed herewith in response to Item 15(a) of Form 10-K.

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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

Form 10-K/A

Amendment No. 1

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

(Mark One)

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

For the fiscal year ended: December 31, 2006

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

For the transition period from _____ to _____

Commission file number: 000-50676

Icagen, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**56-1785001**
(State or other jurisdiction of incorporation or organization)	**(I.R.S. Employer Identification No.)**

4222 Emperor Boulevard, Suite 350
Durham, North Carolina 27703
(Address of principal executive offices, including zip code)

Registrant's telephone number, including area code: (919) 941-5206

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

Title of Class	**Name of Exchange on Which Registered**
Common Stock, $0.001 par value per share	**The Nasdaq Global Market**

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

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act of 1933, or the Securities Act. Yes ☐ No ☒.

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

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

Indicate by check mark 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, or a non-accelerated filer. See definitions of "accelerated filer and large accelerated filer" in Rule 12b-2 of the Exchange Act. (Check One).

Large accelerated filer ☐ Accelerated filer ☒ Non-accelerated filer ☐

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

The aggregate market value of voting and non-voting common equity held by non-affiliates of the registrant, as of June 30, 2006, was approximately $95,297,665 based on the closing sale price of the common stock on such date as reported on the Nasdaq Global Market. For purposes of the immediately preceding sentence, the term "affiliate" consists of each director and executive officer of the registrant.

The number of shares of the registrant's common stock, $0.001 par value per share, outstanding on February 28, 2007 was 37,782,857.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Definitive Proxy Statement for its 2007 Annual Meeting of Stockholders scheduled to be held on June 26, 2007, or the 2007 Proxy Statement, which will be filed with the Securities and Exchange Commission, or SEC, not later than 120 days after December 31, 2006, are hereby incorporated by reference into Part III of this Annual Report on Form 10-K. With the exception of the portions of the 2007 Proxy Statement expressly incorporated into this Annual Report on Form 10-K by reference, such document shall not be deemed filed as part of this Annual Report on Form 10-K.

EXPLANATORY NOTE

We are filing this Amendment No. 1 to our Annual Report on Form 10-K for the fiscal year ended December 31, 2006, as originally filed with the SEC on March 6, 2007, for the sole purpose of revising the Exhibit Index to add Exhibit 10.24. Filed as exhibits with this 10-K/A are new certifications in accordance with Rule 13a-14(a) of the Exchange Act.

This Amendment No. 1 on Form 10-K/A does not reflect events occurring after the filing of the Annual Report on Form 10-K on March 6, 2007, or modify or update the disclosures presented in the Annual Report on Form 10-K, except to reflect the revisions as described above.

SIGNATURES

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

ICAGEN, INC.
(Registrant)

By: /s/ P. KAY WAGONER, PH.D.

P. Kay Wagoner, Ph.D.
Chief Executive Officer and President

Date: April 27, 2007

EXHIBIT INDEX

Exhibit Number	Description
3.1(1)	Restated Certificate of Incorporation of the Registrant.
3.2(1)	Amended and Restated Bylaws of the Registrant.
4.1(2)	Specimen Stock Certificate.
4.2(2)	Amended and Restated Stockholders' Agreement, dated December 15, 2003, by and among the Registrant and the parties listed therein.
4.3(2)	Warrant to Purchase Shares of Series B Preferred Stock, dated December 28, 1994, issued to Dominion Fund III.
4.4(2)	Warrant to Purchase Shares of Series D Preferred Stock, dated May 23, 1997, issued to Dominion Fund III.
4.5(2)	Warrant to Purchase Shares of Series E Preferred Stock, dated September 3, 1998, issued to Dominion Fund III.
4.6(2)	First Amendment to Warrants to Purchase Shares of Preferred Stock of Icagen, Inc., dated May 14, 2004, by and between the Registrant, Dominion Fund III and Dominion Ventures.
4.7(2)	Form of Warrant to Purchase Shares of Series D Convertible Preferred Stock, dated March 15, 1997, issued to certain persons in connection with offering of series D preferred stock.
4.8(3)	Securities Purchase Agreement, dated January 26, 2007, among the Registrant and the purchasers listed on Exhibit A thereto.
4.9(13)	Form of Warrant to Purchase Shares of Common Stock, dated February 6, 2007, issued to certain purchasers in connection with a private placement.
10.1*(2)	1996 Equity Compensation Plan, as amended.
10.2*(1)	2004 Stock Incentive Plan.
10.3*(4)	Form of Incentive Stock Option Agreement under the 2004 Stock Incentive Plan.
10.4*(4)	Form of Nonstatutory Stock Option Agreement under the 2004 Stock Incentive Plan.
10.4.1*(5)	Form of Nonstatutory Stock Option Agreement for Director Options under the 2004 Stock Incentive Plan.
10.4.2*(6)	Nonstatutory Stock Option Agreement, dated February 1, 2006, between the Registrant and Charles A. Sanders.
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10.23†(2)	Copromotion Agreement, dated June 14, 2004, between the Registrant and the McNeil Consumer & Specialty Pharmaceuticals Division of McNeil-PPC, Inc.
10.24†(2)	Collaborative Research and License Agreement, dated October 1, 1997, between the Registrant and Bristol-Myers Squibb Company, as amended.
23.1(13)	Consent of Independent Registered Public Accounting Firm.
31.1(13)	Certification of Chief Executive Officer and President pursuant to Exchange Act Rule 13a-14(a).
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ICAGEN

ION CHANNEL ADVANCES

END