CORTEX PHARMACEUTICALS INC/DE/
Form 424B5
April 15, 2009
Table of Contents

PROSPECTUS SUPPLEMENT NO. 1 **Filed pursuant to Rule 424(b)(5)**

(TO PROSPECTUS DATED DECEMBER 9, 2008) **Registration Statement No. 333-155749**

Cortex Pharmaceuticals, Inc.

1,475 Shares of 0% Series E Convertible Preferred Stock

Warrants to Purchase 6,941,176 Shares of Common Stock

15,617,647 Shares of Common Stock Underlying the Preferred Stock and Warrants

We are offering 1,475 shares of our 0% Series E Convertible Preferred Stock, $0.001 par value per share (the convertible preferred stock), and warrants to purchase up to 6,941,176 shares of our common stock to purchasers in this offering. We are also offering an aggregate of 15,617,647 shares of our common stock issuable upon conversion of the convertible preferred stock and exercise of the warrants. The convertible preferred stock and warrants will be sold in units, with each unit consisting of one share of convertible preferred stock and a warrant to purchase approximately 4,706 shares of common stock. Subject to certain ownership limitations, the convertible preferred stock is convertible at any time at the option of the holder into shares of our common stock at a conversion price of $0.17 per share and the warrants are exercisable at any time on or after the six month anniversary of the date of issuance and before the third anniversary of the initial exercise date at an exercise price of $0.3401 per share of common stock. Each unit will be sold at a negotiated price of $1,000. Units will not be issued or certificated. The shares of convertible preferred stock and warrants are immediately separable and will be issued separately. We are also issuing three-year warrants to purchase up to an aggregate of 433,824 shares of our common stock at an exercise price of $0.26 per share to the placement agent in this offering, which warrants are not covered by this prospectus supplement.

Our common stock is listed on the NYSE Amex Equities Market (formerly the American Stock Exchange) under the symbol COR. The last reported sale price of our common stock on April 14, 2009 was $0.34 per share.

As of April 14, 2009, the aggregate market value of our outstanding common stock held by non-affiliates was approximately $24,372,632, based on 47,615,209 shares of outstanding common stock, of which 744,763 shares are held by affiliates, and a per share price of $0.52 based on the closing sale price of our common stock as quoted on the NYSE Amex Equity Market on February 13, 2009. As of the date hereof, including the securities being offered hereunder, we have offered securities with an aggregate market value of approximately $8,121,176 pursuant to General Instruction I.B.6. of Form S-3 during the prior 12 calendar month period.

Before you invest, you should carefully read this prospectus supplement, the accompanying prospectus and all information incorporated by reference therein. These documents contain information you should consider when making your investment decision.

Investing in our convertible preferred stock, warrants and underlying shares of common stock involves a high degree of risk. Please see the section entitled Risk Factors beginning on page S-5 of this prospectus supplement.

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

We have retained Rodman & Renshaw, LLC to act as our placement agent in connection with the convertible preferred stock, warrants and underlying common stock offered by this prospectus supplement and the accompanying prospectus. We have agreed to pay the placement agent the aggregate placement agent fees set forth in the table below. The placement agent is not purchasing or selling any of these securities nor is it required to sell any specific number or dollar amount of securities, but has agreed to use its reasonable best efforts to sell the securities offered by this prospectus supplement.

	Per Unit	Maximum Offering Amount
Public offering price	$ 1,000	$ 1,475,000
Placement agent fees	$ 60	$ 88,500
Proceeds, before expenses, to us	$ 940	$ 1,386,500

We expect the total offering expenses, excluding placement agents fees, to be approximately $136,500 for all sales pursuant to this prospectus supplement. Because there is no minimum offering amount required as a condition to closing this offering, the actual public offering amount, placement agent fees, and proceeds to us, if any, are not presently determinable and may be substantially less than the maximum amounts set forth above.

The closing of this offering is subject to certain conditions, including the approval of the NYSE Amex Equities Market for the listing of the shares of common stock issuable upon conversion of the convertible preferred stock and upon exercise of the warrants sold in the offering. We expect that delivery of the units being offered pursuant to this prospectus supplement will be made to purchasers on or about April 17, 2009, against payment in immediately available funds.

Rodman & Renshaw, LLC

The date of this prospectus supplement is

April 14, 2009.

Table of Contents

TABLE OF CONTENTS

Prospectus Supplement

SUMMARY	S-1
RISK FACTORS	S-5
NOTE REGARDING FORWARD-LOOKING STATEMENTS	S-12
USE OF PROCEEDS	S-13
DILUTION	S-14
DESCRIPTION OF SECURITIES WE ARE OFFERING	S-15
PLAN OF DISTRIBUTION	S-17
LEGAL MATTERS	S-18
EXPERTS	S-18
WHERE YOU CAN FIND ADDITIONAL INFORMATION	S-19
INCORPORATION BY REFERENCE	S-19

Prospectus

ABOUT THIS PROSPECTUS	1
ABOUT CORTEX PHARMACEUTICALS	1
RISK FACTORS	2
NOTE REGARDING FORWARD-LOOKING STATEMENTS	2
USE OF PROCEEDS	3
GENERAL DESCRIPTION OF SECURITIES	4
DESCRIPTION OF CAPITAL STOCK	4
DESCRIPTION OF THE WARRANTS	5
PLAN OF DISTRIBUTION	6
LEGAL MATTERS	8
EXPERTS	8
WHERE YOU CAN FIND ADDITIONAL INFORMATION	9
INCORPORATION BY REFERENCE	9

We are offering to sell, and seeking offers to buy, shares of our convertible preferred stock, warrants to purchase common stock and underlying common stock only in jurisdictions where offers and sales are permitted. The distribution of this prospectus supplement and the offering of the convertible preferred stock, warrants to purchase common stock and underlying common stock in certain jurisdictions may be restricted by law. Persons outside the United States who come into possession of this prospectus supplement must inform themselves about, and observe any restrictions relating to, the offering of the convertible preferred stock, warrants to purchase common stock and underlying common stock and the distribution of this prospectus supplement outside the United States. This prospectus supplement does not constitute, and may not be used in connection with, an offer to sell, or a solicitation of an offer to buy, any securities offered by this prospectus supplement by any person in any jurisdiction in which it is unlawful for such person to make such an offer or solicitation.

Table of Contents

SUMMARY

About This Prospectus Supplement

This summary highlights selected information about us and this offering. This information is not complete and does not contain all the information you should consider before investing in our common stock and warrants pursuant to this prospectus supplement and the accompanying prospectus. You should carefully read this entire prospectus supplement and the accompanying prospectus, including Risk Factors contained in this prospectus supplement and the financial statements and the other information that we incorporated by reference in the accompanying prospectus, before making an investment decision.

We are providing information to you about our company and this offering of shares of our convertible preferred stock, warrants and underlying common stock in two parts. The first part is this prospectus supplement, which describes the specific terms of this offering and certain other matters relating to us. The second part is the accompanying prospectus, which provides more general information about securities that we may offer from time to time, some of which may not apply to this offering.

We urge you to read this prospectus supplement carefully, including the accompanying prospectus and the documents incorporated by reference, including the risk factors and our consolidated financial statements and the notes to those statements.

You should rely only on the information contained in or incorporated by reference into this prospectus supplement and the accompanying prospectus. If the description varies between this prospectus supplement and the accompanying prospectus, you should rely on the information in this prospectus supplement. We have not, and the placement agent has not, authorized anyone to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it.

We are not making an offer of these securities in any jurisdiction where the offer is not permitted. You should assume that information contained in or incorporated by reference into this prospectus supplement and the accompanying prospectus is accurate only as of the date on the front cover of this prospectus supplement, the accompanying prospectus or the date of the document incorporated by reference, as applicable. Our business, financial condition, results of operations and prospects may have changed since those dates.

Unless we state otherwise or the context indicates otherwise, references to Cortex, Company, we, us and our in this prospectus supplement a the accompanying prospectus refer to Cortex Pharmaceuticals, Inc. Generally, when we refer to this prospectus we are referring to both this prospectus supplement and the accompanying prospectus together.

This offering of convertible preferred stock, warrants and underlying common stock is being made under a registration statement on Form S-3 (registration file no. 333-155749) that we filed with the Securities and Exchange Commission as part of a shelf registration process. Under the shelf registration process, we may offer to sell shares of our common stock, $0.001 par value, shares of our preferred stock, $0.001 par value, or warrants to purchase shares of our common stock and/or preferred stock, from time to time in one or more offerings up to a total dollar amount of $21,000,000.

We are not making any representation to you regarding the legality of an investment in the convertible preferred stock, warrants and underlying common stock by you under applicable law. You should consult with your own legal advisors as to the legal, tax, business, financial and related aspect of a purchase of such securities.

Table of Contents

About Cortex Pharmaceuticals

We are engaged in the discovery and development of innovative pharmaceuticals for the treatment of psychiatric disorders, neurological diseases and brain mediated breathing disorders. Our primary focus is to develop novel small molecule compounds that positively modulate AMPA-type glutamate receptors, a complex of proteins that is involved in communication between nerve cells in the mammalian brain. We are developing a family of proprietary pharmaceuticals known as AMPAKINE® compounds, which enhance the activity of this receptor. We believe that AMPAKINE compounds hold promise for the treatment of neurological and psychiatric diseases and disorders that are known, or thought, to involve depressed functioning of pathways in the brain that use glutamate as a neurotransmitter. Our most advanced clinical compound is CX717, which currently is in Phase II clinical development.

The AMPAKINE platform addresses large potential markets. Our business plan involves partnering with larger pharmaceutical companies for research, development, clinical testing, manufacturing and global marketing of specific AMPAKINE compounds for those indications that require sizable, expensive Phase III clinical trials and very large sales forces to achieve significant market penetration. At the same time, we plan to develop compounds internally for a selected set of indications, many of which will allow us to apply for Orphan Drug status. These indications typically require more modest investment in the development stages, follow a quicker regulatory path to approval, and involve a more concentrated and smaller sales force targeted at selected medical centers in the U.S. and Europe. If we are successful in the pursuit of this operating strategy, we may be in a position to contain our costs over the next few years, to maintain our focus on the research and early development of novel pharmaceuticals (where we believe that we have the ability to compete) and eventually to participate more fully in the commercial development of AMPAKINE products in the United States.

While not an Orphan Drug indication, the acute treatment of respiratory depression represents an additional market that we may potentially pursue internally. However, we will continue to evaluate related partnership opportunities for the indication. We believe that pre-administration of an AMPAKINE compound may prevent opiate-induced respiratory depression, while preserving the opiate s pain relieving effects. As a result, an AMPAKINE compound may improve the safety margin for giving powerful pain relievers following surgical procedures and thereby provide a valuable tool for anesthesiologists and surgeons to optimize pain management in their patients. As we reported in August 2008 and October 2008, two Phase IIa human clinical studies with our AMPAKINE CX717 have demonstrated positive effects on respiratory depression induced by opiates. One of these studies also evaluated the effect of CX717 on the opiate s pain relieving effects. The results from that study demonstrated that the analgesic effects of alfentanil were maintained in two pain models in the presence of CX717.

More comprehensive information about us is available through our Internet website at http://www.cortexpharm.com. The information on our website is not incorporated by reference into this prospectus. Our executive offices are located at 15241 Barranca Parkway, Irvine, California 92618, and our telephone number is (949) 727-3157.

Table of Contents

The Offering

Convertible preferred stock offered by us:	Up to 1,475 shares of convertible preferred stock. This prospectus supplement also relates to the offering of the shares of common stock issuable upon conversion of the convertible preferred stock.
Common stock to be outstanding after this offering:	47,615,209 shares of common stock, or 63,232,856 shares of common stock if the convertible preferred stock and warrants offered hereby are converted and exercised in full.
Warrants:	Warrants to purchase up to 6,941,176 shares of common stock will be offered in this offering, excluding warrants to purchase up to an aggregate of 433,824 shares of common stock to the placement agent in this offering that are not covered by this prospectus supplement. The warrants will be exercisable at any time on or after October 17, 2009 and on or before the close of our business on October 17, 2012 at an exercise price of $0.3401 per share. This prospectus supplement also relates to the offering of the shares of common stock issuable upon exercise of the warrants.
Risk Factors:	See Risk Factors beginning on page S-5 for a discussion of factors that you should read and consider before investing in our securities.
Use of proceeds:	We currently anticipate that the net proceeds from the sale of the convertible preferred stock and warrants, excluding proceeds from the exercise of warrants, if any, will be approximately $1,250,000. The net proceeds from this offering will be added to our general funds and used to accelerate development of our AMPAKINE technology, licensing activities, working capital, capital expenditures and other general corporate purposes. Please see Use of Proceeds on page S-13.
NYSE Amex Equities Symbol:	COR

The number of shares of our common stock that will be outstanding immediately after the offering is based on 47,615,209 shares outstanding as of April 14, 2009. Unless we specifically state otherwise, the share information in this prospectus supplement excludes:

- 11,019,244 shares of common stock issuable upon the exercise of stock options outstanding prior to this offering under our equity incentive plans, at a weighted average exercise price of $1.77 per share;
- 397,463 shares of common stock available for future grants under our equity incentive plans;
- 350,000 shares of common stock issuable upon the exercise of stock options outstanding prior to this offering granted outside of our equity incentive plans, at a weighted average exercise price of $2.59 per share;
- 3,679 shares of common stock issuable upon the conversion of outstanding Series B convertible preferred stock, at a conversion price of $6.795 per share;

Table of Contents

7,943,491 shares of common stock issuable upon the exercise of warrants outstanding prior to this offering, at a weighted average exercise price of $2.38 per share;

6,941,176 shares of common stock issuable upon the exercise of warrants to be issued to purchasers in this offering, at an exercise price of $0.3401 per share; and

433,824 shares of common stock issuable upon exercise of warrants to be issued to the placement agent in this offering, and which are not covered by this prospectus supplement, at an exercise price of $0.26 per share.

Table of Contents

RISK FACTORS

An investment in our securities involves a high degree of risk. Before deciding whether to invest in our securities, you should consider carefully all the information we have included or incorporated by reference in this prospectus supplement and the accompanying prospectus. In addition, you should carefully consider the risk factors described below related to this offering and an investment in our securities. If any of these risks actually occurs, our business, financial condition, results of operations and cash flow could be seriously harmed. This could cause the trading price of our common stock and the value of the convertible preferred stock and warrants offered hereby to decline, resulting in a loss of all or part of your investment.

Risks related to our business

Our independent registered public accounting firm has expressed substantial doubt about our ability to continue as a going concern.

In its audit opinion issued in connection with our balance sheets as of December 31, 2008 and 2007 and our statements of operations, stockholder s equity and cash flows for the years ended December 31, 2008, 2007 and 2006, our independent registered public accounting firm has expressed substantial doubt about our ability to continue as a going concern given our recurring net losses and negative cash flows from operations. Our financial statements for the year ended December 31, 2008 have been prepared on a going concern basis, which contemplates the realization of assets and the satisfaction of liabilities and commitments in the normal course of business. Such financial statements do not include any adjustments relating to the recoverability and classification of recorded asset amounts or amounts of liabilities that might be necessary should we be unable to continue in existence. While we have relied principally in the past on external financing to provide liquidity and capital resources for our operations, we can provide no assurance that cash generated from our operations together with cash received in the future from external financing will be sufficient to enable us to continue as a going concern.

We have a history of net losses; we expect to continue to incur net losses and we may never achieve or maintain profitability.

Since our formation on February 10, 1987 through December 31, 2008, we have generated only modest operating revenues and we have incurred net losses approximating $107,323,000. For the years ended December 31, 2008, 2007 and 2006, our net losses were approximately $14,596,000, $12,969,000, and $16,055,000, respectively. As of December 31, 2008, we had an accumulated deficit of approximately $109,355,000. We have not generated any revenue from product sales to date, and it is possible that we will never generate revenues from product sales in the future. Even if we do achieve significant revenues from product sales, we expect to incur significant operating losses over the next several years. As with other companies in the biotechnology industry, it is possible that we will never achieve profitable operations.

If we are unable to progress in our clinical development of AMPAKINE CX717 for an acute indication in a timely manner, or at all, there could be a significant negative impact on our business operations and the market price of our common stock.

On October 10, 2007, the Division of Psychiatry Products of the FDA notified us that it rejected our IND to study AMPAKINE CX717 in ADHD. The denial was based upon results of animal toxicology studies that we filed with the agency. At this time, we do not anticipate re-submitting further data to the FDA for CX717 in the ADHD indication.

Our objective is to continue our plans to develop CX717 for the acute treatment of respiratory depression and to continue our study of CX717 in our Alzheimer s disease PET scan study. We believe that the IND previously filed with the Division of Neurology Products of the FDA for the treatment of Alzheimer s disease will not be affected by the actions of the Division of Psychiatry Products. However, there can be no assurance that we will receive final FDA approval for any eventual New Drug Application submission.

We also believe that by developing an acute use for CX717, such as treatment of respiratory depression, the risks perceived to be associated with higher chronic doses required for ADHD may be mitigated. Additionally, the risk/benefit ratio for the treatment of patients with life-threatening respiratory depression is substantially different than for the treatment of ADHD. Also, our preclinical data for animal models of improvement of memory and cognition consistently shows that the dose level of CX717 required is 5-10 fold less than the dose required in animal models of ADHD. We believe that either lower dosage levels for chronic administration and/or acute uses are possible options for the continued development of CX717.

Table of Contents

If we are unable to progress in our clinical development of AMPAKINE CX717 for an acute indication in a timely manner, or at all, there could be a significant negative impact on our business operations and the market price of our common stock.

We will need additional capital in the future and, if it is not available on terms acceptable to us, or at all, we may need to scale back our research and development efforts and may be unable to continue our business operations.

We will require substantial additional funds to advance our research and development programs and to continue our operations, particularly if we decide to independently conduct later-stage clinical testing and apply for regulatory approval of any of our proposed products, and if we independently undertake marketing and promotion of our products. Additionally, we may require additional funds in the event that we decide to pursue strategic acquisitions of or licenses for other products or businesses. Based on our current operating plan, including planned clinical trials and other product research and development costs, we estimate that our existing cash resources and the anticipated net proceeds from our offering of convertible preferred stock and warrants to purchase shares of our common stock subject to this prospectus supplement, will be sufficient to meet our requirements late into the third quarter of calendar year 2009. We believe that we will require additional capital to fund on-going operations beyond that time. Additional funds may result from milestone payments related to our agreements with Organon and Servier, although there is no assurance that we will receive milestone payments from Organon or Servier within the desired timeframe, or at all. Additional funds also may result from the exercise of warrants to purchase shares of our common stock. As of April 14, 2009, warrants to purchase up to approximately 7.9 million shares of our common stock were outstanding at exercise prices ranging from $1.65 to $4.29 per share. If these remaining warrants are fully exercised, of which there can be no assurance, such exercise would provide approximately $18,930,000 of additional capital.

Our cash requirements in the future may be significantly different from our current estimates and depend on many factors, including:

- the results of our clinical trials;
- the time and costs involved in obtaining regulatory approvals;
- the costs of setting up and operating our own marketing and sales organization;
- the ability to obtain funding under contractual and licensing agreements;
- the costs involved in obtaining and enforcing patents or any litigation by third parties regarding intellectual property; and
- our success in entering into collaborative relationships with other parties.

To finance our future activities, we may seek funds through additional rounds of financing, including private or public equity or debt offerings and collaborative arrangements with corporate partners. We cannot say with any certainty that we will be able to obtain the additional needed funds on reasonable terms, or at all. The sale of additional equity or convertible debt securities could result in additional dilution to our stockholders. If we issued preferred equity or debt securities, these securities could have rights superior to holders of our common stock, and could contain covenants that will restrict our operations. We might have to obtain funds through arrangements with collaborative partners or others that may require us to relinquish rights to our technologies, product candidates or products that we otherwise would not relinquish. As previously announced, in early March 2009 we reduced our workforce in an effort to conserve our capital resources. If adequate funds are not available in the near term, we could lose our key employees and might have to further delay, scale back or eliminate one or more of our research and development programs, which would impair our future prospects. In addition, we may be unable to meet our research spending obligations under our existing licensing agreements and may be unable to continue our business operations.

Table of Contents

Our products rely on licenses from The Regents of the University of California and The Governors of the University of Alberta, and if we lose access to these technologies or applications, our business would be substantially impaired.

Under our agreements with The Regents of the University of California, we have exclusive rights to AMPAKINE compounds for all applications for which the University has patent rights, other than endocrine modulation. Under our agreement with The Governors of the University of Alberta, we have exclusive rights to the use of AMPAKINE compounds to prevent and treat respiratory depression induced by opiate analgesics, barbiturates and anesthetic and sedative agents.

Our rights to certain of the AMPAKINE compounds are secured by patents or patent applications owned wholly by the University of California or by the University of California as a co-owner with us. Our existing agreements with the University of California require the University of California to prepare, file, prosecute and maintain patent applications related to our licensed rights at our expense. Such agreements also require us to make certain minimum annual payments, meet certain milestones or diligently seek to commercialize the underlying technology.

Under such agreements, we are required to make minimum annual royalty payments approximating $70,000. Separately, we are required to spend a minimum of $250,000 per year to advance the AMPAKINE compounds until we begin marketing an AMPAKINE compound. The commercialization efforts in the agreements require us to file for regulatory approval of an AMPAKINE compound before October 2012.

Our rights to the use of AMPAKINE compounds to prevent and treat respiratory depression induced by opiate analgesics, barbiturates and anesthetic and sedative agents include rights to a patent application owned wholly by The Governors of the University of Alberta. Our existing agreement with The University of Alberta requires us to file, prosecute and maintain patent applications related to our licensed rights in coordination with the University of Alberta. Such agreement also requires us to make certain minimum annual payments pursuant to the terms of a research agreement, meet certain milestones and diligently seek to commercialize the underlying technology. Although we currently are in compliance with our obligations under the agreements with each of The Regents of the University of California and The Governors of the University of Alberta, including minimum annual payments and diligence milestones, our failure to meet any of these requirements could allow the respective university to terminate that particular agreement. Management believes that it maintains a strong relationship with each such university.

We are at an early stage of development and we may not be able to successfully develop and commercialize our products and technologies.

The development of AMPAKINE products is subject to the risks of failure commonly experienced in the development of products based upon innovative technologies and the expense and difficulty of obtaining approvals from regulatory agencies. Drug discovery and development is time consuming, expensive and unpredictable. On average, only one out of many thousands of chemical compounds discovered by researchers proves to be both medically effective and safe enough to become an approved medicine. In the fields that we target, approximately one in five compounds placed in clinical trials generally reaches the market. All of our proposed products are in the preclinical or early clinical stage of development and will require significant additional funding for research, development and clinical testing before we are able to submit them to any of the regulatory agencies for clearances for commercial use. Our trials that are subject to our collaborative research arrangements are being funded by third parties and do not involve financial commitments from us.

The process from discovery to development to regulatory approval can take several years and drug candidates can fail at any stage of the process. Late stage clinical trials often fail to replicate results achieved in earlier studies. Historically, in our industry more than half of all compounds in development failed during Phase II trials and 30% failed during Phase III trials. We cannot assure you that we will be able to complete successfully any of our research and development activities. Even if we do complete them, we may not be able to market successfully any of the products or be able to obtain the necessary regulatory approvals or assure that healthcare providers and payors will accept our products. We also face the risk that any or all of our products will not work as intended or that they will be unsafe, or that, even if they do work and are safe, that our products will be uneconomical to manufacture and market on a large scale. Due to the extended testing and regulatory review process required before we can obtain marketing clearance, we do not expect to be able to commercialize any therapeutic drug for several years, either directly or through our corporate partners or licensees.

Table of Contents

We may not be able to enter into the strategic alliances necessary to fully develop and commercialize our products and technologies, and we will be dependent on our corporate partners if we do.

In addition to our agreements with Organon and Servier, we are seeking other pharmaceutical company partners to develop other major indications for the AMPAKINE compounds. These agreements would potentially provide us with additional funds in exchange for exclusive or non-exclusive license or other rights to the technologies and products that we are currently developing. Competition between biopharmaceutical companies for these types of arrangements is intense. Although we have been engaged in discussions with candidate companies for some time, we cannot give any assurance that these discussions will result in an agreement or agreements in a timely manner, or at all. Additionally, we cannot assure you that any resulting agreement will generate sufficient revenues to offset our operating expenses and longer-term funding requirements.

If we are unable to maintain our relationships with academic consultants and the University of California, Irvine, our business could suffer.

We depend upon our relationships with academic consultants, particularly Dr. Gary S. Lynch of the University of California, Irvine. Dr. Lynch plays a key role in guiding our research. In addition, we sponsor preclinical research in Dr. Lynch s laboratories at the University of California, Irvine that is part of our product development and corporate partnering profile. If our relationship with Dr. Lynch or the University of California, Irvine, is disrupted, our AMPA- receptor research program could be adversely affected. The term of our consulting agreement with Dr. Lynch commenced in November 1987 and will continue until terminated by either party to the agreement upon at least 60 days prior written notice to the other party. Our agreements with our other consultants are generally also terminable by the consultant on short notice. We maintain a positive relationship with Dr. Lynch and continue to fund research related to understanding the molecular actions of the AMPAKINE compounds and the AMPA receptor in his laboratory.

Risks related to our industry

If we fail to secure adequate intellectual property protection, it could significantly harm our financial results and ability to compete.

Our success will depend, in part, on our ability to get patent protection for our products and processes in the U.S. and elsewhere. We have filed and intend to continue to file patent applications as we need them. However, additional patents that may issue from any of these applications may not be sufficiently broad to protect our technology. Also, any patents issued to us or licensed by us may be designed around or challenged by others, and if such challenge is successful, it may diminish our rights.

If we are unable to obtain sufficient protection of our proprietary rights in our products or processes prior to or after obtaining regulatory clearances, our competitors may be able to obtain regulatory clearance and market competing products by demonstrating the equivalency of their products to our products. If they are successful at demonstrating the equivalency between the products, our competitors would not have to conduct the same lengthy clinical tests that we have conducted.

We also rely on trade secrets and confidential information that we try to protect by entering into confidentiality agreements with other parties. Those confidentiality agreements may be breached, and our remedies may be insufficient to protect the confidential information. Further, our competitors may independently learn our trade secrets or develop similar or superior technologies. To the extent that our consultants, key employees or others apply technological information independently developed by them or by others to our projects, disputes may arise regarding the proprietary rights to such information. We cannot assure you that such disputes will be resolved in our favor.

We may be subject to potential product liability claims. One or more successful claims brought against us could materially impact our business and financial condition.

The clinical testing, manufacturing and marketing of our products may expose us to product liability claims. We maintain liability insurance with coverage limits of $10 million per occurrence and $10 million in the annual aggregate. We have never been

Table of Contents

subject to a product liability claim, and we require each patient in our clinical trials to sign an informed consent agreement that describes the risks related to the trials, but we cannot assure you that the coverage limits of our insurance policies will be adequate or that one or more successful claims brought against us would not have a material adverse effect on our business, financial condition and result of operations. Further, if one of our AMPAKINE compounds is approved by the FDA for marketing, we cannot assure you that adequate product liability insurance will be available, or if available, that it will be available at a reasonable cost. Any adverse outcome resulting from a product liability claim could have a material adverse effect on our business, financial condition and results of operations.

We face intense competition that could result in products that are superior to the products that we are developing.

Our business is characterized by intensive research efforts. Our competitors include many companies, research institutes and universities that are working in a number of pharmaceutical or biotechnology disciplines to develop therapeutic products similar to those we are currently investigating. For example, the Pharmaceutical Research and Manufacturers of America recently estimated that more than 100 pharmaceutical and biotechnology companies are conducting research in the field of neurological disorders, with over 25 drugs under clinical investigation in the U.S. for the treatment of Alzheimer s disease. Virtually all of the major multinational pharmaceutical companies have active projects in these areas. Most of these competitors have substantially greater financial, technical, manufacturing, marketing, distribution and/or other resources than we do. In addition, many of our competitors have experience in performing human clinical trials of new or improved therapeutic products and obtaining approvals from the FDA and other regulatory agencies. We have no experience in conducting and managing later-stage clinical testing or in preparing applications necessary to obtain regulatory approvals. Accordingly, it is possible that our competitors may succeed in developing products that are safer or more effective than those that we are developing and may obtain FDA approvals for their products faster than we can. We expect that competition in this field will continue to intensify.

We may be unable to recruit and retain our senior management and other key technical personnel on whom we are dependent.

We are highly dependent upon senior management and key technical personnel and currently do not carry any insurance policies on such persons. In particular, we are highly dependent on our Executive Chairman, Roger G. Stoll, Ph.D.; our President and Chief Executive Officer, Mark A. Varney, Ph.D.; and our Chief Medical Officer, Pierre V. Trân, M.D., M.M.M., all of whom have entered into employment agreements with us. Competition for qualified employees among pharmaceutical and biotechnology companies is intense. As previously announced, in early March 2009 we reduced our workforce in an effort to conserve our capital resources, which reduction included certain of our technical personnel. The loss of any of our senior management or additional loss of our technical personnel, or our inability to attract, retain and motivate the additional highly-skilled employees and consultants that our business requires, could substantially hurt our business and prospects.

The regulatory approval process is expensive, time consuming, uncertain and may prevent us from obtaining required approvals for the commercialization of some of our products.

The FDA and other similar agencies in foreign countries have substantial requirements for therapeutic products. Such requirements often involve lengthy and detailed laboratory, clinical and post-clinical testing procedures and are expensive to complete. It often takes companies many years to satisfy these requirements, depending on the complexity and novelty of the product. The review process is also extensive, which may delay the approval process even more. According to the Pharmaceutical Research and Manufacturers of America, historically the cost of developing a new pharmaceutical from discovery to approval was approximately $800 million, and this amount is expected to increase annually.

As of yet, we have not obtained any approvals to market our products. Further, we cannot assure you that the FDA or other regulatory agency will grant us approval for any of our products on a timely basis, if at all. Even if regulatory clearances are obtained, a marketed product is subject to continual review, and later discovery of previously unknown problems may result in restrictions on marketing or withdrawal of the product from the market.

Table of Contents

Other risks

Our stock price may be volatile and our common stock could decline in value.

The market price of securities of life sciences companies in general has been very unpredictable. The range of sales prices of our common stock for the fiscal years ended December 31, 2008, 2007 and 2006, as quoted on the NYSE Amex Equities Market (formerly The American Stock Exchange), was $0.41 to $1.24, $0.44 to $3.47 and $1.19 to $5.94, respectively. The following factors, in addition to factors that affect that market generally, could significantly impact our business, and the market price of our common stock could decline:

- competitors announcing technological innovations or new commercial products;
- competitors publicity regarding actual or potential products under development;
- regulatory developments in the U.S. and foreign countries;
- developments concerning proprietary rights, including patent litigation;
- public concern over the safety of therapeutic products; and
- changes in healthcare reimbursement policies and healthcare regulations.

There is a large number of shares of common stock that may be sold, which may depress the market price of our stock.

As of April 10, 2009, we had approximately 47.6 million shares of common stock outstanding. Additionally, if all warrants and options outstanding as of such date are exercised prior to their expiration, approximately 19.0 million additional shares of common stock could become freely tradable without restriction. Sales of substantial amounts of common stock in the public market could adversely affect the prevailing market price of our common stock and could also make it more difficult for us to raise funds through future offerings of common stock.

Our charter document and shareholder rights plan may prevent or delay an attempt by our stockholders to replace or remove management.

Certain provisions of our restated certificate of incorporation, as amended, could make it more difficult for a third party to acquire control of our business, even if such change in control would be beneficial to our stockholders. Our restated certificate of incorporation, as amended, allows our Board of Directors to issue up to 549,500 shares of preferred stock without stockholder approval. Pursuant to this authority, in February 2002 our Board of Directors adopted a shareholder rights plan and declared a dividend of a right to purchase one one-thousandth of a share of preferred stock for each outstanding share of our common stock. The ability of our Board of Directors to issue additional preferred stock and our shareholder rights plan may have the effect of delaying or preventing an attempt by our stockholders to replace or remove existing directors and management.

We may be unable to maintain the standards for listing on the NYSE Amex Equities Market, which could adversely affect the liquidity of our common stock.

Our common stock is currently listed on the NYSE Amex Equities Market. There are several requirements that we must satisfy in order for our common stock to continue to be listed on the NYSE Amex Equities Market. We may not comply with all of these listing requirements, which may result in the delisting of our common stock. Delisting from the NYSE Amex Equities Market could adversely affect the liquidity and the price of our common stock and could have a long-term adverse impact on our ability to raise future capital through a sale of shares of our common stock. If our common stock were delisted it would be traded on an electronic bulletin board established for securities that are not traded on a national securities exchange or traded in quotations published by the Pink OTC Markets, Inc., commonly referred to as the pink sheets. If

this occurs, it could be difficult to sell our securities or obtain the same level of market information as to the price of shares of our common stock as is currently available.

Table of Contents

If our common stock were delisted and determined to be a penny stock, a broker-dealer may find it more difficult to trade our common stock and an investor may find it more difficult to acquire or dispose of our common stock in the secondary market.

In addition, if our common stock were delisted, it may be subject to the so-called penny stock rules. The SEC has adopted regulations that define a penny stock to be any equity security that has a market price per share of less than $5.00, subject to certain exceptions, such as any securities listed on a national securities exchange. For any transaction involving a penny stock, unless exempt, the rules impose additional sales practice requirements on broker-dealers, subject to certain exceptions. If our common stock were delisted and determined to be a penny stock, a broker-dealer may find it more difficult to trade our common stock and an investor may find it more difficult to acquire or dispose of our common stock on the secondary market.

Risks related to this offering

Since we have broad discretion in how we use the proceeds from this offering, we may use the proceeds in ways in which you disagree.

We have not allocated specific amounts of the net proceeds from this offering for any specific purpose. Accordingly, our management will have significant flexibility in applying the net proceeds of this offering. You will be relying on the judgment of our management with regard to the use of these net proceeds, and you will not have the opportunity, as part of your investment decision, to assess whether the proceeds are being used appropriately. It is possible that the net proceeds will be invested in a way that does not yield a favorable, or any, return for us. The failure of our management to use such funds effectively could have a material adverse effect on our business, financial condition, operating results and cash flow.

Investors in this offering will pay a much higher price than the book value of our stock.

The public offering price of the securities offered hereby is likely to be substantially higher than the book value per share of our common stock. Investors purchasing securities in this offering may, therefore, incur immediate dilution in net tangible book value per share of the common stock issuable upon conversion or exercise of the securities purchased in this offering. See Dilution on page S-14 for a more detailed discussion of the dilution you will incur in this offering.

There is no public market for the convertible preferred stock or the warrants to purchase common stock in this offering.

There is no established public trading market for the convertible preferred stock or the warrants being offered in this offering, and we do not expect a market to develop. In addition, we do not intend to apply for listing the convertible preferred stock or the warrants on any securities exchange or for quotation on the NYSE Amex Equities Market. Without an active market, the liquidity of the convertible preferred stock and the warrants will be limited.

Table of Contents

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein include forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Forward-looking statements are those that predict or describe future events or trends and that do not relate solely to historical matters. You can generally identify forward-looking statements as statements containing the words believe, expect, will, anticipate, intend, estimate, project, plan, assume or other similar expressions, or negatives of those expres not all forward-looking statements contain these identifying words. All statements contained or incorporated by reference in this prospectus supplement and the accompanying prospectus regarding our future strategy, future operations, projected financial position, estimated future revenues, projected costs, future prospects, the future of our industries and results that might be obtained by pursuing management s current plans and objectives are forward-looking statements.

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date on the cover of this prospectus supplement or, in the case of forward-looking statements incorporated by reference, as of the date of the filing that includes the statement. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results, performance or achievements that are expressed or implied by our forward-looking statements, and such difference might be significant and materially adverse to our security holders. We do not undertake and specifically decline any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments.

We have identified some of the important factors that could cause future events to differ from our current expectations and they are described in this prospectus supplement under the caption Risk Factors as well as in our most recent Annual Report on Form 10-K, including, without limitation, under the captions Risk Factors and Management s Discussion and Analysis of Financial Condition and Results of Operations and in other documents that we may file with the SEC, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus supplement and the accompanying prospectus.

Table of Contents

USE OF PROCEEDS

We estimate that the net proceeds of this offering, after deducting placements agent fees and our estimated offering expenses, and excluding the proceeds, if any, from the exercise of the warrants issued in this offering, will be approximately $1,250,000 if we sell the maximum number of units.

We currently intend to use the net proceeds from this offering for working capital and for general corporate purposes, which may include, among other things, funding development of our AMPAKINE technology, licensing activities and capital expenditures.

We cannot estimate precisely the allocation of the net proceeds from this offering among these uses. The amounts and timing of the expenditures may vary significantly, depending on numerous factors, including the progress of our clinical trials and other development efforts as well as the amount of cash used in our operations. Accordingly, our management will have broad discretion in the application of the net proceeds of this offering. We reserve the right to change the use of proceeds as a result of certain contingencies such as competitive developments, opportunities to acquire technologies or products and other factors. Pending the uses described above, we may temporarily invest the net proceeds of this offering in short- and medium-term interest-bearing obligations, investment-grade instruments, certificates of deposit or direct or guaranteed obligations of the U.S. government.

Table of Contents

DILUTION

Purchasers of units offered by this prospectus supplement and the accompanying prospectus will suffer immediate and substantial dilution in the net tangible book value per share of common stock. Our net tangible book value as of December 31, 2008 was approximately $3,396,722, or approximately $0.07 per share of common stock. Net tangible book value per share represents the amount of total tangible assets less total liabilities, divided by the number of shares of our common stock outstanding as of December 31, 2008.

Dilution in net tangible book value per share represents the difference between the amount per share of common stock underlying the convertible preferred stock paid by purchasers in this offering and the net tangible book value per share of our common stock immediately after this offering. After giving effect to our sale of 1,475 shares of convertible preferred stock, or 8,676,471 shares of common stock issuable upon conversion of the convertible preferred stock at a public offering price of $0.17 per share, and after deduction of the placement agent fees and estimated offering expenses payable by us, our net tangible book value as of December 31, 2008 would have been approximately $4,646,722, or $0.08 per share of common stock. This represents an immediate increase of $0.01 in net tangible book value per share of common stock to our existing stockholders and an immediate dilution in net tangible book value of ($0.09) per share of common stock to purchasers of units in this offering. The following table illustrates this per share dilution:

Public offering price per share of common stock underlying convertible preferred stock		$ 0.17
Net tangible book value per share as of December 31, 2008	$ 0.07	
Increase in net tangible book value per share attributable to this offering	$ 0.01	
Net tangible book value per share as of December 31, 2008, after giving effect to this offering		$ 0.08
Dilution in net tangible book per share to new investors		$ (0.09)

New investors that purchase common stock upon exercise of warrants may experience dilution depending on our net tangible book value at the time of exercise.

The above table is based on 56,291,680 shares of our common stock outstanding as of December 31, 2008 (as adjusted for 8,676,471 shares of common stock to be issued in this offering upon conversion of the convertible preferred stock) and excludes, as of December 31, 2008:

- 11,554,319 shares of common stock issuable upon the exercise of stock options outstanding prior to this offering under our equity incentive plans, at a weighted average exercise price of $1.73 per share;
- 112,386 shares of common stock available for future grants under our equity incentive plans;
- 3,679 shares of common stock issuable upon the conversion of outstanding Series B convertible preferred stock, at a conversion price of $6.795 per share;
- 11,920,628 shares of common stock issuable upon the exercise of warrants outstanding prior to this offering, at a weighted average exercise price of $2.67 per share;
- 6,941,176 shares of common stock issuable upon the exercise of warrants to be issued in this offering, at an exercise price of $0.3401 per share; and
- 433,824 shares of common stock issuable upon exercise of warrants to be issued to the placement agent in this offering, which warrants are not covered by this prospectus supplement, at an exercise price of $0.26 per share.

To the extent that any options or warrants are exercised, new options are issued under our equity incentive plans, or we otherwise issue additional shares of common stock in the future, there will be further dilution to new investors.

Table of Contents

DESCRIPTION OF SECURITIES WE ARE OFFERING

In this offering, we are offering a maximum of 1,475 units, consisting of 1,475 shares of convertible preferred stock and warrants to purchase 6,941,176 shares of common stock. Each unit consists of one share of convertible preferred stock and warrants to purchase approximately 4,706 shares of common stock at an exercise price of $0.3401 per share. We are also issuing warrants to purchase up to an aggregate of 433,824 shares of common stock at an exercise price of $0.26 per share to the placement agent in this offering, which warrants are not covered by this prospectus supplement. This prospectus also relates to the offering of shares of our common stock upon the conversion or exercise, if any, of the convertible preferred stock or warrants issued to the investors in this offering.

Convertible Preferred Stock

The material terms and provisions of the convertible preferred stock being offered pursuant to this prospectus supplement and the accompanying prospectus are summarized below. This summary is subject to, and qualified in its entirety by, the terms and conditions set forth in the certificate of designation authorizing the convertible preferred stock, which will be provided to the investors in this offering.

We will authorize the convertible preferred stock by filing a certificate of designation with the Secretary of State of the State of Delaware. The certificate of designation may be authorized by our board of directors without approval by our stockholders.

The convertible preferred stock will be convertible at the option of the holder at any time into shares of our common stock at a conversion price of $0.17 per share. The conversion price of the convertible preferred stock will be subject to adjustment in the case of stock splits, stock dividends, combinations of shares and similar recapitalization transactions. The convertible preferred stock will be subject to automatic conversion into shares of common stock upon the occurrence of a change in control of our company and we may become obligated to redeem the convertible preferred stock upon the occurrence of certain triggering events, including the occurrence of a change in control of our company or the occurrence of certain insolvency events relating to our company. The holder will not have the right to convert any portion of its convertible preferred stock if the holder, together with its affiliates, would, subject to limited exceptions, beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after the conversion.

The convertible preferred stock does not provide for mandatory dividend rights. Except as required by law, holders of the convertible preferred stock are not entitled to voting rights, except that the affirmative vote of the holders of a majority of the outstanding shares of convertible preferred stock is required to take certain actions that may adversely affect the rights or preferences of the holders of convertible preferred stock.

The securities purchase agreement pursuant to which the convertible preferred stock will be issued and the certificate of designation authorizing the preferred stock include certain agreements and covenants for the benefit of the holders of convertible preferred stock, including restrictions on our ability to amend our certificate of incorporation or bylaws, pay cash dividends or distributions with respect to our common stock or other junior securities, repurchase shares of common stock or other junior securities, issue additional equity securities for a period of 60-days after the closing of the offering and incur indebtedness.

Warrants

The material terms and provisions of the warrants being offered pursuant to this prospectus supplement and the accompanying prospectus are summarized below. This summary is subject to, and qualified in its entirety by, the form of warrant, which will be provided to the investors in this offering.

The warrants will provide for an exercise price of $0.3401 per share and will be exercisable at the option of the holder at any time on or after the six-month anniversary of the closing date of the transaction and before the third anniversary of the initial exercise date. The exercise price of the warrants will be subject to adjustment in the case of stock splits, stock dividends, combinations of shares and similar recapitalization transactions. The holder will not have the right to exercise any portion of the warrant if the holder, together with its affiliates, would, subject to limited exceptions, beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after the exercise.

Table of Contents

The warrants will be subject to a call provision that will permit us to cancel the warrants in the event the volume weighted average price of our common stock exceeds $0.6802 for a period of 20 consecutive trading days, the average daily volume of our common stock during such 20 trading day period exceeds $100,000 per trading day and certain other conditions are satisfied. Holders will be permitted to exercise the warrants, at their option, prior to the date the warrants are cancelled.

The warrant holders must surrender payment in cash of the exercise price of the shares being acquired upon exercise of the warrants. If, however, we are unable to offer and sell the shares underlying these warrants pursuant to this prospectus supplement due to the ineffectiveness of the registration statement of which this prospectus supplement is a part, then the warrants may only be exercised on a net or cashless basis.

Common Stock

The material terms and provisions of our common stock and each other class of our securities which qualifies or limits our common stock are described under the caption Description of Capital Stock starting on page 4 of the accompanying prospectus.

Table of Contents

PLAN OF DISTRIBUTION

We have entered into an engagement letter agreement, dated April 13, 2009, with Rodman & Renshaw, LLC, or Rodman. Subject to the terms and conditions set forth in the agreement, Rodman has agreed to act as our placement agent in connection with this offering. The placement agent is not purchasing any units offered by this prospectus supplement or the accompanying prospectus, nor is it required to arrange for the purchase or sale of any specific number or dollar amount of the units, but has agreed to use its reasonable best efforts to arrange for the sale of all of the units offered.

There is no requirement that any minimum number of units or dollar amount of units be sold in this offering and there can be no assurance that we will sell all or any of the units being offered.

The agreement with the placement agent provides that the obligations of the placement agent and the investors are subject to certain conditions precedent, including, among other things, the absence of any material change in our business, receipt of a customary written legal opinion, receipt of the approval by the NYSE Amex Equities Market for the listing of the shares of common stock underlying the warrants and the convertible preferred stock, and FINRA having raised no objection to the fairness and reasonableness of the terms and arrangements of the agreement.

We currently anticipate that the closing of this offering will take place on or about April 17, 2009. On the scheduled closing date, the following will occur:

- we will receive funds in the amount of the aggregate purchase price;
- the placement agent will receive the placement agent fees and warrant in accordance with the terms of the engagement letter agreement; and
- we will deliver the units to the investors.

We have agreed to pay the placement agent an aggregate fee equal to 6.0% of the gross proceeds of the sale of the units in this offering. We have also agreed to reimburse the placement agent for expenses incurred by it in connection with this offering in an amount equal to the lesser of 1.0% of the gross offering proceeds or $25,000. In addition, we agreed to grant compensation warrants to the placement agent to purchase a number of our common shares equal to 5.0% of the number of shares of common stock sold by us in the offering (and excluding any shares subject to warrants) or up to an aggregate of 433,824 shares, at an exercise price of $0.26 per share. Under no circumstances will the fee, commission or discount received by the placement agent or any other FINRA member or independent broker-dealer exceed eight percent of the gross proceeds to us in this offering or any other offering in the United States pursuant the base prospectus.

The compensation warrants will be substantially on the same terms as the warrants offered hereby, except that the compensation warrants will have an exercise price equal to $0.26 per share and will otherwise comply with FINRA Rule 5110(g)(1) in that for a period of six months after the issuance date of the compensation warrants (which shall not be earlier than the closing date of the offering pursuant to which the compensation warrants are being issued) neither the compensation warrants nor any warrant shares issued upon exercise of the compensation warrants shall be sold, transferred, assigned, pledged, or hypothecated, or be the subject of any hedging, short sale, derivative, put, or call transaction that would result in the effective economic disposition of the securities by any person for a period of 180 days immediately following the date of effectiveness or commencement of sales of the offering pursuant to which the compensation warrants are being issued, except the transfer of any security:

- by operation of law or by reason of reorganization of us;
- to any FINRA member firm participating in this offering and the officers or partners thereof, if all securities so transferred remain subject to the lock-up restriction described above for the remainder of the time period;

if the aggregate amount of our securities held by Rodman or related persons do not exceed 1% of the securities being offered;

Table of Contents

that is beneficially owned on a pro-rata basis by all equity owners of an investment fund, provided that no participating member manages or otherwise directs investments by the fund, and participating members in the aggregate do not own more than 10% of the equity in the fund; or

the exercise or conversion of any security, if all securities received remain subject to the lock-up restriction set forth above for the remainder of the time period.

The estimated offering expenses payable by us, in addition to the aggregate fee of $88,500 due to the placement agent, are approximately $136,500, which includes legal, accounting and printing costs, reimbursement of certain expenses to the placement agent, and various other fees associated with registering the securities and listing the common stock. After deducting certain fees due to the placement agent and our estimated offering expenses, we expect the net proceeds from this offering to be approximately $1,250,000 if the maximum number of units are sold.

The following table shows the per unit and total commissions we will pay to the placement agent in connection with the sale of the units offered pursuant to this prospectus supplement and the accompanying prospectus, assuming the purchase of all of the units offered hereby.

Per unit	$ 60
Maximum offering total	$ 88,500

Because there is no minimum offering amount required as a condition to closing in this offering, the actual total offering commissions, if any, are not presently determinable and may be substantially less than the maximum amount set forth above.

The placement agent proposes to arrange for the sale to one or more purchasers of the units offered pursuant to this prospectus supplement and the accompanying prospectus directly through a securities purchase agreement between the purchasers and us.

We have agreed to indemnify the placement agent against certain liabilities relating to or arising out of its activities under the engagement letter agreement. We have also agreed to contribute to payments the placement agent may be required to make in respect of such liabilities.

The engagement letter agreement, the form of securities purchase agreement and the form of warrant issued in this offering will be included as exhibits to our Current Report on Form 8-K that will be filed with the SEC in connection with the consummation of this offering.

The transfer agent for our common stock is American Stock Transfer & Trust Company. We will act as transfer agent for the shares of convertible preferred stock and warrants being offered hereby.

Our common stock is traded on the NYSE Amex Equities Market under the symbol COR. Neither the convertible preferred stock nor the warrants to purchase common stock are not expected to be eligible for trading on any market.

The price per share for the units and the exercise price for the warrants was determined based on negotiations with the purchasers and discussions with Rodman.

LEGAL MATTERS

The validity of the securities being offered hereby will be passed on by Stradling Yocca Carlson & Rauth, a Professional Corporation, Newport Beach, California. Feldman Weinstein & Smith LLP, New York, New York, is counsel for the placement agent in connection with this offering.

EXPERTS

Haskell & White LLP, an independent registered public accounting firm, has audited our balance sheets as of December 31, 2008 and December 31, 2007, and related statements of operations, stockholders equity (deficit) and cash flows for the years ended December 31, 2008, 2007 and 2006, included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2008,

Table of Contents

as set forth in their report, which is incorporated by reference in this prospectus supplement, in the accompanying prospectus and elsewhere in the registration statement. Our financial statements and management s assessment are incorporated by reference in reliance on Haskell & White LLP s report, given on the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed a registration statement on Form S-3 with the SEC. This prospectus supplement and accompanying prospectus, which are a part of the registration statement, do not contain all of the information contained in the registration statement. Because some information is omitted, you should refer to the registration statement and its exhibits for additional information. For example, the descriptions in this prospectus supplement and accompanying prospectus regarding the contents of any of our contracts, agreements or other documents, are not necessarily complete and you should refer to the exhibits attached to the registration statement or incorporated by reference for copies of the actual contract, agreement or other document. You may obtain copies of the registration statement from the SEC at the address listed below or from the SEC s web site.

We are subject to the information and periodic reporting requirements of the Exchange Act, and in accordance therewith file periodic reports, current reports, proxy statements and other information with the SEC. Such periodic reports, current reports, proxy statements, other information and copies of the registration statement may be inspected by anyone without charge and copies of these materials may be obtained upon the payment of the fees prescribed by the SEC, at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The registration statement and the periodic reports, current reports, proxy statements and other information filed by us are also available through the Internet web site maintained by the SEC at the following address: http://www.sec.gov.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus the information we file with it. This means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is considered to be a part of this prospectus, and later information we file with the SEC will automatically update and supersede this information. The following documents filed with the SEC (in each case, Commission File No. 1-16467) are incorporated by reference in this prospectus:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2008, filed with the SEC on April 15, 2009;
- our Current Report on Form 8-K dated March 13, 2009, filed with the SEC on March 19, 2009;
- the description of our common stock contained in our Registration Statement on Form 8-A, filed with the SEC under Section 12(b) of the Exchange Act on May 2, 2001, including any amendment or report filed for the purpose of updating such description; and
- the description of our preferred stock purchase rights contained in our Registration Statement on Form 8-A/A, filed with the SEC under Section 12(b) of the Exchange Act on February 15, 2002, including any amendment or report filed for the purpose of updating such description.

We are also incorporating by reference any future filings we make with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until this offering is completed, including those made between the date of filing of the registration statement and prior to effectiveness of the registration statement, except for information furnished under Item 2.02 or Item 7.01 of our Current Reports on Form 8-K which is not deemed to be filed and not incorporated by reference herein.

You may request a copy of these filings (other than an exhibit to a filing unless that exhibit is specifically incorporated by reference into that filing), at no cost, by writing or calling us at Cortex Pharmaceuticals, Inc., 15241 Barranca Parkway, Irvine, California 92618, telephone number (949) 727-3157, Attention: Chief Financial Officer.

Table of Contents

PROSPECTUS

CORTEX PHARMACEUTICALS, INC.

$21,000,000

Common Stock

Preferred Stock

Warrants

We may, from time to time in one or more offerings, sell up to $21,000,000 in the aggregate, inclusive of any exercise price thereof, of:

- shares of our common stock;
- shares of our preferred stock;
- warrants to purchase shares of our common stock and/or preferred stock; or
- any combination of the foregoing.

We will provide the specific terms of these securities in supplements to this prospectus. The prospectus supplement may also add, update or change information in this prospectus. You should read this prospectus and any prospectus supplement, as well as the documents incorporated by reference or deemed to be incorporated by reference into this prospectus, carefully before you invest. **This prospectus may not be used to offer or sell securities unless accompanied by a prospectus supplement**.

Our principal executive offices are located at 15241 Barranca Parkway, Irvine, California 92618, and our telephone number is (949) 727-3157.

Our common stock is listed on the NYSE Alternext US (formerly the American Stock Exchange) under the symbol COR. Each prospectus supplement will contain information, where applicable, as to any listing on the NYSE Alternext US or any other securities exchange covered by the prospectus supplement.

As of November 25, 2008, the aggregate market value of our outstanding common stock held by non-affiliates was approximately $23,442,000, based on 47,592,459 shares of outstanding common stock, of which 709,013 shares are held by affiliates, and a per share price of $0.51 based on the closing sale price of our common stock as quoted on the NYSE Alternext US on November 25, 2008. As of the date hereof we have not offered any securities pursuant to General Instruction I.B.6. of Form S-3 during the prior 12 calendar month period that ends on and includes the date hereof.

Investing in the securities we may offer involves various risks. We strongly recommend that you read carefully the risks we describe in this prospectus as well as in any accompanying prospectus supplement and the risk factors in our most current reports filed with the Securities and Exchange Commission, for a fuller understanding of the risks and uncertainties that we face. See the sections entitled Risk Factors on page 2 and Note Regarding Forward-Looking Statements on page 2.

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

The date of this prospectus is December 9, 2008.

Table of Contents

TABLE OF CONTENTS

ABOUT THIS PROSPECTUS	1
ABOUT CORTEX PHARMACEUTICALS	1
RISK FACTORS	2
NOTE REGARDING FORWARD-LOOKING STATEMENTS	2
USE OF PROCEEDS	3
GENERAL DESCRIPTION OF SECURITIES	4
DESCRIPTION OF CAPITAL STOCK	4
DESCRIPTION OF THE WARRANTS	5
PLAN OF DISTRIBUTION	6
LEGAL MATTERS	8
EXPERTS	8
WHERE YOU CAN FIND ADDITIONAL INFORMATION	9
INCORPORATION BY REFERENCE	9

Table of Contents

ABOUT THIS PROSPECTUS

This prospectus is part of a registration statement that we filed with the Securities and Exchange Commission, or the SEC, using a shelf registration process. Under this shelf registration process, we may offer from time to time up to $21,000,000 in the aggregate, inclusive of any exercise price thereof, of the following securities:

- shares of our common stock;
- shares of our preferred stock;
- warrants to purchase shares of our common stock and/or preferred stock; or
- any combination of the foregoing.

This prospectus provides you with a general description of the securities we may offer. Each time we offer securities, we will provide you with a prospectus supplement that describes the specific amounts, prices and terms of the securities we may offer. The prospectus supplement also may add, update or change information contained in this prospectus. You should read carefully both this prospectus and any prospectus supplement together with additional information described below under Information Incorporated By Reference.

This prospectus does not contain all the information provided in the registration statement we filed with the SEC. For further information about us or the securities offered hereby, you should refer to that registration statement, which you can obtain from the SEC as described below under Where You Can Find More Information.

You should rely only on the information contained or incorporated by reference in this prospectus or a prospectus supplement. We have not authorized any other person to provide you with different information. If anyone provides you with different or inconsistent information, you should not rely on it. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information appearing in this prospectus or any prospectus supplement, as well as information we have previously filed with the SEC and incorporated by reference, is accurate only as of the date on the front of those documents. Our business, financial condition, results of operations and prospects may have changed since those dates.

We may sell the securities to or through underwriters, dealers or agents or directly to purchasers. We and our agents reserve the sole right to accept or reject in whole or in part any proposed purchase of securities. The prospectus supplement, which we will provide to you each time we offer securities, will set forth the names of any underwriters, dealers or agents involved in the sale of the securities, and any applicable fee, commission or discount arrangements with them. See Plan of Distribution.

ABOUT CORTEX PHARMACEUTICALS

In this prospectus, the terms Cortex, the Company, we, us, and our refer to Cortex Pharmaceuticals, Inc.

Cortex is engaged in the discovery and development of innovative pharmaceuticals for the treatment of psychiatric disorders, neurological diseases and brain mediated breathing disorders. Our primary focus is to develop novel small molecule compounds that positively modulate AMPA-type glutamate receptors, a complex of proteins that is involved in communication between nerve cells in the mammalian brain. We are developing a family of proprietary pharmaceuticals known as Ampakine® compounds, which enhance the activity of this receptor. We believe that Ampakine compounds hold promise for the treatment of neurological and psychiatric diseases and disorders that are known, or thought, to involve depressed functioning of pathways in the brain that use glutamate as a neurotransmitter. Our most advanced clinical compound is CX717, which currently is in Phase II clinical development.

The Ampakine platform addresses large potential markets. Our business plan involves partnering with larger pharmaceutical companies for research, development, clinical testing, manufacturing and global marketing of specific Ampakine compounds for

1

Table of Contents

those indications that require sizable, expensive Phase III clinical trials and very large sales forces to achieve significant market penetration. At the same time, we plan to develop compounds internally for a selected set of indications, many of which will allow us to apply for Orphan Drug status. These indications typically require more modest investment in the development stages, follow a quicker regulatory path to approval, and involve a more concentrated and smaller sales force targeted at selected medical centers in the U.S. and Europe. If we are successful in the pursuit of this operating strategy, we may be in a position to contain our costs over the next few years, to maintain our focus on the research and early development of novel pharmaceuticals (where we believe that we have the ability to compete) and eventually to participate more fully in the commercial development of AMPAKINE products in the United States.

While not an Orphan Drug indication, the acute treatment of respiratory depression represents an additional market that we may potentially pursue internally. However, we will continue to evaluate related partnership opportunities for the indication. We believe that pre-administration of an AMPAKINE compound may prevent opiate-induced respiratory depression, while preserving the opiate s pain relieving effects. As a result, an AMPAKINE compound may improve the safety margin for giving powerful pain relievers following surgical procedures and thereby provide a valuable tool for anesthesiologists and surgeons to optimize pain management in their patients. As we reported in August 2008 and October 2008, two Phase IIa human clinical studies with our AMPAKINE CX717 have demonstrated positive effects on respiratory depression induced by opiates. One of these studies also evaluated the effect of CX717 on the opiate s pain relieving effects. The results from that study demonstrated that the analgesic effects of alfentanil were maintained in two pain models in the presence of CX717.

More comprehensive information about us is available through our Internet website at http://www.cortexpharm.com. The information on our website is not incorporated by reference into this prospectus. Our executive offices are located at 15241 Barranca Parkway, Irvine, California 92618, and our telephone number is (949) 727-3157.

RISK FACTORS

Before making an investment decision, you should carefully consider the risks described under Risk Factors in the applicable prospectus supplement and in our most recent Annual Report on Form 10-K, or any updates in our Quarterly Reports on Form 10-Q, together with all of the other information appearing in this prospectus or incorporated by reference into this prospectus and any applicable prospectus supplement, in light of your particular investment objectives and financial circumstances. The risks so described are not the only risks facing our company. Additional risks not presently known to us or that we currently deem immaterial may also impair our business operations. Our business, financial condition or results of operations could be materially adversely affected by any of these risks. The trading price of our securities could decline due to any of these risks, and you may lose all or part of your investment.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus, any prospectus supplement and the documents incorporated by reference herein include forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, or the Securities Act, and Section 21E of the Securities Exchange Act of 1934, as amended, or the Exchange Act. Forward-looking statements are those that predict or describe future events or trends and that do not relate solely to historical matters. You can generally identify forward-looking statements as statements containing the words believe, expect, will, anticipate, intend, estimate, project, plan, assume or other similar expressions, or negatives of those expressions, although not all forward-looking statements contain these identifying words. All statements contained or incorporated by reference in this prospectus and any prospectus supplement regarding our future strategy, future operations, projected financial position, estimated future revenues, projected costs, future prospects, the future of our industries and results that might be obtained by pursuing management s current plans and objectives are forward-looking statements.

You should not place undue reliance on our forward-looking statements because the matters they describe are subject to known and unknown risks, uncertainties and other unpredictable factors, many of which are beyond our control. Our forward-looking statements are based on the information currently available to us and speak only as of the date on the cover of this prospectus, the date of any prospectus supplement, or, in the case of forward-looking statements incorporated by reference, as of the date of the filing that includes the statement. New risks and uncertainties arise from time to time, and it is impossible for us to predict these matters or how they may affect us. Over time, our actual results, performance or achievements will likely differ from the anticipated results,

Table of Contents

performance or achievements that are expressed or implied by our forward-looking statements, and such difference might be significant and materially adverse to our security holders. We do not undertake and specifically decline any obligation to update any forward-looking statements or to publicly announce the results of any revisions to any statements to reflect new information or future events or developments.

We have identified some of the important factors that could cause future events to differ from our current expectations and they are described in this prospectus and supplements to this prospectus under the caption Risk Factors as well as in our most recent Annual Report on Form 10-K, including without limitation under the captions Risk Factors, Management s Discussion and Analysis of Financial Condition and Results of Operations and Quantitative and Qualitative Disclosures About Market Risk, and in other documents that we may file with the SEC, all of which you should review carefully. Please consider our forward-looking statements in light of those risks as you read this prospectus and any prospectus supplement.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of our securities offered by us hereby. Except as described in any prospectus supplement, we currently intend to use the net proceeds from the sale of securities offered by us pursuant to this prospectus for working capital, capital expenditures and other general corporate purposes. We may also use such proceeds to fund acquisitions of businesses, technologies or product lines that complement our current business. However, we currently have no commitments or agreements for any specific acquisitions. Pending application of the net proceeds, we intend to invest the net proceeds of the offering of securities by us in investment-grade, interest-bearing securities.

Table of Contents

GENERAL DESCRIPTION OF SECURITIES

We, directly or through agents, dealers or underwriters designated from time to time, may offer, issue and sell, together or separately, in one or more offerings, up to $21,000,000 in the aggregate, inclusive of any exercise price thereof, of:

- shares of our common stock, par value $0.001 per share;
- shares of our preferred stock, par value $0.001 per share;
- warrants to purchase shares of our common stock and/or preferred stock; or
- any combination of the foregoing, either individually or as units consisting of one or more of the foregoing, each on terms to be determined at the time of sale.

The common stock, the preferred stock and the warrants are collectively referred to herein as the securities. This prospectus provides you with a general description of the securities we may offer. Each time we offer securities, we will provide you with a prospectus supplement that describes the specific amounts, prices and terms of the securities we offer. The securities involve various risks that we will describe in the section entitled Risk Factors that will be included in each prospectus supplement.

DESCRIPTION OF CAPITAL STOCK

Common Stock

We have authority under our restated certificate of incorporation, as amended, to issue up to 105,000,000 shares of our common stock, par value $0.001 per share. As of November 25, 2008, there were 47,592,459 shares of our common stock issued and outstanding.

Holders of shares of our common stock are entitled to one vote per share held of record on all matters submitted to a vote of stockholders, including the election of directors. The holders are entitled to receive dividends when, as and if declared by our board of directors, in its discretion, out of funds legally available therefor, subject to preferences that may be applicable to any outstanding shares of our preferred stock. In the event of our liquidation, dissolution or winding up, the holders of our common stock are entitled to share ratably in all of our assets remaining after payment of liabilities and after payment of any preferential amounts to which holders of shares of any series of our preferred stock that may be outstanding in the future, may be entitled. The holders of our common stock have no preemptive or other subscription rights, and there are no conversion rights or redemption or sinking fund provisions with respect to such shares. All of the outstanding shares of our common stock are, and the shares of our common stock when issued will be, fully paid and nonassessable.

Preferred Stock

We have authority under our restated certificate of incorporation, as amended, to issue up to 5,000,000 shares of our preferred stock, par value $0.001 per share, of which (i) 1,250,000 shares have been designated as 9% cumulative convertible preferred stock, (ii) 3,200,000 shares have been designated as Series B convertible preferred stock, (iii) 500 shares have been designated as Series D convertible preferred stock and (iv) 35,000 shares have been designated as Series A junior participating preferred stock, as described in Description of Capital Stock-Stockholder Rights Plan. The remaining 514,500 shares of preferred stock are presently undesignated. As of November 25, 2008, there were 37,500 shares of our Series B convertible preferred stock issued and outstanding. As of such date, there were no other shares of our preferred stock issued and outstanding.

Our board of directors may from time to time issue the undesignated preferred stock in one or more series and, in connection with the creation of each such series, fix the number of shares of such series and the designations, powers, preferences, rights, qualifications, limitations, and restrictions of such series, to the fullest extent permitted under the Delaware General Corporation Law. Any preferred stock issued by us in the future may decrease the amount of earnings and assets available for distribution to holders of our common stock or adversely affect the rights and power, including voting rights, of the holders of our common stock without any further vote or action by our stockholders. In addition, the rights of holders of our common stock will be subject to, and may be adversely affected by, the rights of the holders of any preferred stock that

may be issued by us in the future.

Table of Contents

Stockholder Rights Plan

On February 5, 2002, our board of directors approved the adoption of a stockholder rights plan and declared a divided distribution of one right for each outstanding share of our common stock on February 15, 2002. Each share of our common stock presently issued and outstanding includes one right and each share of our common stock that may be issued after the date hereof will also include one right. The rights automatically attach to outstanding shares of our common stock and no separate certificates are issued. The rights trade only together with shares of our common stock.

Each right allows its holder to purchase a unit consisting of one one-thousandth of a share of our Series A junior participating preferred stock at a purchase price of $75.00 per unit, subject to adjustment. The rights are not currently exercisable, but will become exercisable upon the earlier of (i) 10 days following a public announcement that a person or group of affiliated or associated persons has acquired, or obtained the right to acquire, beneficial ownership of 15% or more of our outstanding common stock or (ii) 10 business days following the commencement of a tender offer or exchange offer that would result in a person or group beneficially owning 15% or more of our outstanding common stock. Once the rights become exercisable, each holder of a right may purchase shares of our common stock, or, under certain circumstances, shares of the common stock of the acquiring person or group, having a value equal to two times the exercise price of the right.

Our board of directors may redeem the rights in whole, at a redemption price of $0.001 per right, at any time until 10 days following the acquisition of 15% or more of our outstanding common stock by a person or group. Unless earlier redeemed or exchanged by us, the rights will expire on February 15, 2012.

DESCRIPTION OF THE WARRANTS

We may issue warrants to purchase shares of our common stock and/or our preferred stock. The warrants may be issued independently or together with shares of our common stock and/or our preferred stock and may be attached to or separate from the shares of our common stock and/or our preferred stock. The warrants are to be issued under warrant agreements to be entered into between us and/or a bank or trust company, as warrant agent, all as shall be set forth in the prospectus supplement relating to warrants being offered pursuant to such prospectus supplement. The following description of the warrants will apply to the warrants offered by this prospectus unless we provide otherwise in the applicable prospectus supplement. The applicable prospectus supplement for a particular series of warrants may specify different or additional terms.

Warrants

The applicable prospectus supplement will describe the following terms of warrants offered:

- the title of the warrants;
- the securities for which the warrants are exercisable;
- the price or prices at which the warrants will be issued;
- the provisions, if any, for changes to or adjustments in the exercise price;
- the provisions, if any, for call rights or put rights relating to the warrants or the underlying securities;
- the date on which the right to exercise the warrants shall commence and the date on which the right will expire;

if applicable, the number of warrants issued with each share of our common stock and/or our preferred stock;

Table of Contents

if applicable, the date on and after which the warrants and the related common stock and/or preferred stock will be separately transferable;

a discussion of any material federal income tax consequences of holding or exercising the warrants; and

any other terms of the warrants, including terms, procedures and limitations relating to the exchange and exercise of the warrants.

Holders of warrants will not be entitled, by virtue of being such holders, to vote, consent, receive dividends, receive notice as stockholders with respect to any meeting of stockholders for the election of our directors or any other matter, or to exercise any rights whatsoever as our stockholders.

The exercise price payable and the number of shares of our common stock and/or our preferred stock purchasable upon the exercise of each warrant will be subject to adjustment in certain events, including the issuance of a stock dividend to holders of our common stock and/or our preferred stock or a stock split, reverse stock split, combination, subdivision or reclassification of our common stock and/or our preferred stock. In lieu of adjusting the number of shares of our common stock and/or our preferred stock purchasable upon exercise of each warrant, we may elect to adjust the number of warrants. No fractional shares will be issued upon exercise of the warrants, but we will pay the cash value of any fractional shares otherwise issuable. Notwithstanding the foregoing, in case of any consolidation, merger, or sale or conveyance of our property as an entirety or substantially as an entirety, the holder of each outstanding warrant shall have the right to the kind and amount of shares of stock and other securities and property, including cash, receivable by a holder of the number of shares of our common stock and/or our preferred stock into which the warrant was exercisable immediately prior to such transaction.

Exercise of Warrants

Each warrant will entitle the holder to purchase for cash such shares of our common stock and/or our preferred stock at such exercise price as shall in each case be set forth in, or be determinable as set forth in, the prospectus supplement relating to the warrants offered thereby. Warrants may be exercised at any time up to the close of business on the expiration date set forth in the prospectus supplement relating to the warrants offered thereby. After the close of business on the expiration date, unexercised warrants will become void.

The warrants may be exercised as set forth in the prospectus supplement relating to the warrants offered. Upon receipt of payment and the warrant certificate properly completed and duly executed at the corporate trust office of the warrant agent or any other office indicated in the prospectus supplement, we will, as soon as practicable, forward the shares of our common stock and/or our preferred stock purchasable upon such exercise. If less than all of the warrants represented by such warrant certificate are exercised, a new warrant certificate will be issued for the remaining warrants.

PLAN OF DISTRIBUTION

We may sell the securities through underwriters or dealers, through agents, or directly to one or more purchasers or through a combination of these methods. The applicable prospectus supplement will describe the terms of the offering of the securities, including:

the name or names of any underwriters, if any, and if required, any dealers or agents;

the purchase price of the securities and the proceeds we will receive from the sale;

any underwriting discounts and other items constituting underwriters compensation;

any discounts or concessions allowed or reallowed or paid to dealers; and

any securities exchange or market on which the securities may be listed.

We may distribute the securities from time to time in one or more transactions at:

at fixed price or prices, which may be changed from time to time;

Table of Contents

market prices prevailing at the time of sale;

prices related to such prevailing market prices; or

negotiated prices.

Only underwriters named in the prospectus supplement are underwriters of the securities offered by the prospectus supplement.

If we use underwriters in the sale of securities, they will acquire the securities for their own account and may resell them from time to time in one or more transactions at a fixed public offering price or at varying prices determined at the time of sale. We may offer the securities to the public through underwriting syndicates represented by managing underwriters or by underwriters without a syndicate. Any public offering price and any discounts or concessions allowed or reallowed or paid to dealers may change from time to time.

If we use a dealer in the sale of the securities being offered pursuant to this prospectus, we will sell the securities to the dealer, as principal. The dealer may then resell the securities to the public at varying prices to be determined by the dealer at the time of resale.

We may sell securities directly or through agents we designate from time to time. We will name any agent involved in the offering and sale of securities and we will describe any commissions we will pay the agent in the prospectus supplement. Unless the prospectus supplement states otherwise, our agent will act on a best-efforts basis for the period of its appointment.

We may authorize agents or underwriters to solicit offers by institutional investors to purchase securities from us at the public offering price set forth in the prospectus supplement pursuant to delayed delivery contracts providing for payment and delivery on a specified date in the future. We will describe the conditions to these contracts and the commissions we must pay for solicitation of these contracts in the prospectus supplement.

In connection with the sale of the securities, underwriters, dealers or agents may receive compensation from us or from purchasers of the securities for whom they act as agents, in the form of discounts, concessions or commissions. Underwriters may sell the securities to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters or commissions from the purchasers for whom they may act as agents. Underwriters, dealers and agents that participate in the distribution of the securities, and any institutional investors or others that purchase securities directly and then resell the securities, may be deemed to be underwriters, and any discounts or commissions received by them from us and any profit on the resale of the securities by them may be deemed to be underwriting discounts and commissions under the Securities Act.

We may provide agents and underwriters with indemnification against particular civil liabilities, including liabilities under the Securities Act, or contribution with respect to payments that the agents or underwriters may make with respect to such liabilities. Agents and underwriters may engage in transactions with, or perform services for, us in the ordinary course of business.

In addition, we may enter into derivative transactions with third parties (including the writing of options), or sell securities not covered by this prospectus to third parties in privately negotiated transactions. If the applicable prospectus supplement indicates, in connection with such a transaction, the third parties may, pursuant to this prospectus and the applicable prospectus supplement, sell securities covered by this prospectus and the applicable prospectus supplement. If so, the third party may use securities borrowed from us or others to settle such sales and may use securities received from us to close out any related short positions. We may also loan or pledge securities covered by this prospectus and the applicable prospectus supplement to third parties, who may sell the loaned securities or, in an event of default in the case of a pledge, sell the pledged securities pursuant to this prospectus and the applicable prospectus supplement. The third party in such sale transactions will be an underwriter and will be identified in the applicable prospectus supplement or in a post-effective amendment.

All securities we offer other than common stock will be new issues of securities with no established trading market. Any underwriters may make a market in these securities, but will not be obligated to do so and may discontinue any market making at any time without notice. We cannot guarantee the liquidity of the trading markets for any securities.

Table of Contents

Underwriters may engage in stabilizing and syndicate covering transactions in accordance with Rule 104 under the Exchange Act. Rule 104 permits stabilizing bids to purchase the securities being offered as long as the stabilizing bids do not exceed a specified maximum. Underwriters may over-allot the offered securities in connection with the offering, thus creating a short position in their account. Syndicate covering transactions involve purchases of the offered securities by underwriters in the open market after the distribution has been completed in order to cover syndicate short positions. Underwriters may also cover an over-allotment or short position by exercising their over-allotment option, if any. Stabilizing and syndicate covering transactions may cause the price of the offered securities to be higher than it would otherwise be in the absence of these transactions. These transactions, if commenced, may be discontinued at any time.

LEGAL MATTERS

The validity of the securities being offered hereby will be passed on by Stradling Yocca Carlson & Rauth, a Professional Corporation, Newport Beach, California.

EXPERTS

Haskell & White LLP, independent registered public accounting firm, has audited our balance sheets as of December 31, 2007 and December 31, 2006, and related statements of operations, stockholders equity and cash flows for each of the years in the three-year period ended December 31, 2007, included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2007, and the effectiveness of our internal control over financial reporting as of December 31, 2007, as set forth in their report, which is incorporated by reference in this prospectus and elsewhere in the registration statement. Our financial statements and management s assessment are incorporated by reference in reliance on Haskell & White LLP s report, given on the authority of said firm as experts in accounting and auditing.

Table of Contents

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We have filed a registration statement on Form S-3 with the SEC relating to the common stock, the preferred stock and the warrants offered by this prospectus. This prospectus does not contain all of the information set forth in the registration statement and the exhibits and schedules thereto. We have omitted parts of the registration statement, as permitted by the rules and regulations of the SEC. Statements contained in this prospectus as to the contents of any contract or other document referred to are not necessarily complete and in each instance reference is made to the copy of such contract or other document filed as an exhibit to the registration statement, each such statement being qualified in all respects by such reference. For further information with respect to us and the common stock, the preferred stock and the warrants offered hereby, reference is made to such registration statement, exhibits and schedules.

We are subject to the information and periodic reporting requirements of the Exchange Act, and in accordance therewith file periodic reports, current reports, proxy statements and other information with the SEC. Such periodic reports, current reports, proxy statements, other information and a copy of the registration statement on Form S-3 may be inspected by anyone without charge and copies of these materials may be obtained upon the payment of the fees prescribed by the SEC, at the Public Reference Room maintained by the SEC at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The registration statement on Form S-3 and the periodic reports, current reports, proxy statements and other information filed by us are also available through the Internet web site maintained by the SEC at the following address: http://www.sec.gov.

INCORPORATION BY REFERENCE

The SEC allows us to incorporate by reference into this prospectus the information we file with it. This means that we can disclose important information to you by referring you to those documents. The information we incorporate by reference is considered to be a part of this prospectus, and later information we file with the SEC will automatically update and supersede this information. The following documents filed with the SEC (in each case, Commission File No. 1-16467) are incorporated by reference in this prospectus:

our Annual Report on Form 10-K for the fiscal year ended December 31, 2007, filed with the SEC on March 17, 2008;

our Quarterly Report on Form 10-Q for the quarter ended March 31, 2008, filed with the SEC on May 8, 2008;

our Quarterly Report on Form 10-Q for the quarter ended June 30, 2008, filed with the SEC on August 11, 2008;

our Quarterly Report on Form 10-Q for the quarter ended September 30, 2008, filed with the SEC on November 7, 2008;

our Current Report on Form 8-K dated May 14, 2008, filed with the SEC on May 19, 2008;

our Current Report on Form 8-K dated May 30, 2008, filed with the SEC on June 3, 2008;

our Current Report on Form 8-K dated June 6, 2008, filed with the SEC on June 10, 2008;

our Current Report on Form 8-K dated July 11, 2008, filed with the SEC on July 17, 2008;

our definitive Proxy Statement dated April 10, 2008, filed with the SEC on April 10, 2008 in connection with our 2008 Annual Meeting of Stockholders;

the description of our common stock contained in our Registration Statement on Form 8-A, filed with the SEC under Section 12(b) of the Exchange Act on May 2, 2001, including any amendment or report filed for the purpose of updating such description; and

Table of Contents

the description of our preferred stock purchase rights contained in our Registration Statement on Form 8-A/A, filed with the SEC under Section 12(b) of the Exchange Act on February 15, 2002, including any amendment or report filed for the purpose of updating such description.

We are also incorporating by reference any future filings we make with the SEC under Section 13(a), 13(c), 14 or 15(d) of the Exchange Act until this offering is completed, including those made between the date of filing of the initial registration statement and prior to effectiveness of the registration statement, except for information furnished under Item 2.02 or Item 7.01 of our Current Reports on Form 8-K which is not deemed to be filed and not incorporated by reference herein.

You may request a copy of these filings (other than an exhibit to a filing unless that exhibit is specifically incorporated by reference into that filing), at no cost, by writing or calling us at Cortex Pharmaceuticals, Inc., 15241 Barranca Parkway, Irvine, California 92618, telephone number (949) 727-3157, Attention: Chief Financial Officer.

Table of Contents

1,475 Shares of Convertible Preferred Stock

Warrants to Purchase 6,941,176 Shares of Common Stock

15,617,647 Shares of Common Stock Underlying the Preferred Stock and Warrants

Prospectus Supplement

Rodman & Renshaw, LLC

April 14, 2009