

ACADIA PHARMACEUTICALS INC

Form 424B5

March 30, 2012

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Filed Pursuant to Rule 424(b)(5)

Registration No. 333-178748

Prospectus Supplement

(To Prospectus dated January 6, 2012)

\$20,000,000

Common Stock

We have entered into an at-the-market issuance sales agreement with MLV & Co. LLC relating to the sale of shares of our common stock offered by this prospectus supplement and the accompanying prospectus. In accordance with the terms of the sales agreement, we may offer and sell shares of our common stock, \$0.0001 par value per share, having an aggregate offering price of up to \$20,000,000 million from time to time through MLV acting as agent, provided that in no event will we sell more than 20,000,000 shares in this offering.

Our common stock is listed on The NASDAQ Global Market under the symbol ACAD . The last reported sale price of our common stock on March 29, 2012 was \$2.13 per share.

Sales of our common stock, if any, under this prospectus supplement and the accompanying prospectus will be made by any method that is deemed an at-the-market offering as defined in Rule 415 promulgated under the Securities Act of 1933, as amended, including by means of ordinary brokers transactions at market prices, in block transactions or as otherwise agreed by MLV and us. MLV will act as our sales agent on a best efforts basis using commercially reasonable efforts consistent with its normal trading and sales practices. There is no arrangement for funds to be received in any escrow, trust or similar arrangement.

MLV will be entitled to compensation at a fixed commission rate of 3% of the gross sales price per share sold. In connection with the sale of the common stock on our behalf, MLV may be deemed to be an underwriter within the meaning of the Securities Act of 1933, as amended, and the compensation of MLV may be deemed to be underwriting commissions or discounts. We have also agreed to provide indemnification and contribution to MLV with respect to certain liabilities, including liabilities under the Securities Act of 1933, as amended.

Investing in our securities involves significant risks. Before buying shares of our common stock, you should carefully consider the risk factors described in Risk Factors beginning on page S-5 of this prospectus supplement and in the documents incorporated by reference into this prospectus supplement and any free writing prospectus that we have authorized for use in connection with this offering.

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

The date of this prospectus supplement is March 30, 2012

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus relate to an offering of our common stock. Before buying any of the common stock that we are offering, we urge you to carefully read this prospectus supplement and the accompanying prospectus, together with the information incorporated by reference as described under the headings Where You Can Find More Information and Incorporation of Certain Documents by Reference in this prospectus supplement. These documents contain important information that you should consider when making your investment decision.

References in this prospectus supplement or the accompanying prospectus to ACADIA, the Company, we, us and our refer to ACADIA Pharmaceuticals Inc.

This document is in two parts. The first part is this prospectus supplement, which describes the terms of this offering of common stock and also adds to, updates and changes information contained in the accompanying prospectus and the documents incorporated by reference. The second part is the accompanying prospectus, which gives more general information. To the extent the information contained in this prospectus supplement differs from or conflicts with the information contained in the accompanying prospectus or any document incorporated by reference, the information in this prospectus supplement will control. If any statement in one of these documents is inconsistent with a statement in another document having a later date—for example, a document incorporated by reference into the accompanying prospectus—the statement in the document having the later date modifies or supersedes the earlier statement.

You should rely only on the information contained or incorporated by reference in this prospectus supplement, the accompanying prospectus and any related free writing prospectus that we have authorized for use in connection with this offering. We have not authorized, and MLV has not authorized, anyone to provide you with different information. No one is making offers to sell or seeking offers to buy these securities in any jurisdiction where the offer or sale is not permitted. You should assume that the information contained in this prospectus supplement is accurate as of the date on the front cover of this prospectus supplement only and that any information we have incorporated by reference or included in the accompanying prospectus is accurate only as of the date given in the document incorporated by reference or as of the date of the prospectus, as applicable, regardless of the time of delivery of this prospectus supplement, the accompanying prospectus, any related free writing prospectus, or any sale of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

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

ACADIA and R-SAT are our trademarks. This prospectus supplement, the accompanying prospectus and the documents incorporated by reference also include trademarks and trade names owned by other parties, and these trademarks and trade names are the property of their respective owners. Use or display by us of other parties' trademarks, trade dress or products in this prospectus supplement, the accompanying prospectus or the documents incorporated by reference is not intended to, and does not imply a relationship with, or endorsements or sponsorship of, us by the trademark or trade dress owners.

Information contained on, or that can be accessed through, our website does not constitute part of this prospectus supplement, the accompanying prospectus or any related free writing prospectus.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus supplement, the accompanying prospectus and the documents incorporated by reference herein contain 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. These statements relate to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Forward-looking statements include, but are not limited to statements about:

the progress or timing of clinical trials involving our drug candidates;

the benefits to be derived from our drug candidates or the design of our clinical trials;

the progress of our research and development programs;

the benefits to be derived from relationships with our collaborators;

the receipt of regulatory clearances and approvals;

our estimates of future payments, revenues and profitability; and

our estimates regarding our capital requirements and our need for additional financing.

In some cases, you can identify forward-looking statements by terms such as may, will, should, could, would, expects, plans, anticipates, believes, estimates, projects, predicts, potential and similar expressions intended to identify forward-looking statements. These statements represent our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in the documents incorporated by reference herein in greater detail under the heading Risk Factors. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement.

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You should understand that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in this prospectus supplement, the accompanying prospectus and any related free writing prospectus that we have authorized for use in connection with this offering by these cautionary statements. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements. Before deciding to purchase our securities, you should carefully consider the risk factors incorporated by reference herein, in addition to the other information set forth in this prospectus supplement, the accompanying prospectus and in the documents incorporated by reference herein.

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PROSPECTUS SUPPLEMENT SUMMARY

This summary does not contain all the information that you should consider before investing in our common stock. You should carefully read the entire prospectus supplement and the accompanying prospectus, including the Risk Factors sections, as well as the financial statements and the other information incorporated by reference herein and the information in any free writing prospectus that we may authorize for use in connection with this offering before making an investment decision.

Overview

We are a biopharmaceutical company focused on innovative small molecule drugs that address unmet medical needs in neurological and related central nervous system disorders. We have four product candidates in clinical development led by pimavanserin, which is in Phase III development as a potential first-in-class treatment for Parkinson's disease psychosis. We hold worldwide commercialization rights to pimavanserin. In addition, we have a product candidate in Phase II development for chronic pain and a product candidate in Phase I development for glaucoma, both in collaboration with Allergan, Inc., and a product candidate in Phase I development for schizophrenia in collaboration with Meiji Seika Pharma Co., Ltd. In addition, we have preclinical programs directed at Parkinson's disease and other neurological disorders. All of the product candidates in our pipeline emanate from discoveries made using our proprietary drug discovery platform.

Corporate Information

We were originally incorporated in Vermont in 1993 as Receptor Technologies, Inc. In 1997, we reincorporated in Delaware. Our executive offices are located at 3911 Sorrento Valley Boulevard, San Diego, California 92121, and our telephone number is (858) 558-2871. Our website address is www.acadia-pharm.com. Information contained on, or that can be accessed through, our website is not a part of this prospectus supplement, the accompanying prospectus or any of the documents incorporated by reference herein or any free writing prospectus that we may authorize for use in connection with this offering.

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THE OFFERING

| | |
|------------------------------|---|
| Common stock offered by us | Shares having an aggregate offering price of up to \$20,000,000 million, provided that in no event will we sell more than 20,000,000 shares in this offering. |
| Manner of offering | At-the-market offering that may be made from time to time through our sales agent, MLV. See Plan of Distribution on page S-8. |
| Use of Proceeds | We intend to use the net proceeds from this offering, if any, to fund ongoing and new clinical trials, to support research and preclinical development activities and for general corporate purposes, including working capital. See the section entitled Use of Proceeds on Page S-6. |
| Risk Factors | Investing in our securities involves a high degree of risk. See the information contained in or incorporated by reference under the heading Risk Factors in this prospectus supplement, in the accompanying prospectus and in the documents incorporated by reference into this prospectus supplement and any free writing prospectus that we have authorized for use in connection with this offering. |
| NASDAQ Global Market Listing | Our common stock is listed on The NASDAQ Global Market under the symbol ACAD . |

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RISK FACTORS

Investment in our common stock involves risks. Before deciding whether to invest in our common stock, you should consider carefully the risk factors discussed below and those contained in the section entitled "Risk Factors" contained in our Annual Report on Form 10-K for the fiscal year ended December 31, 2011, as filed with the Securities and Exchange Commission, or the SEC, on March 6, 2012, which is incorporated herein by reference in its entirety, as well as any amendment or update to our risk factors reflected in subsequent filings with the SEC. If any of the risks or uncertainties described in our SEC filings actually occurs, our business, financial condition, results of operations or cash flow could be materially and adversely affected. This could cause the trading price of our common stock to decline, resulting in a loss of all or part of your investment.

The risks and uncertainties we have described are not the only ones facing our company. Additional risks and uncertainties not presently known to us or that we currently deem immaterial may also affect our business operations.

Risks Related to this Offering

Management will have broad discretion as to the use of the proceeds from this offering, and may not use the proceeds effectively.

Because we have not designated the amount of net proceeds from this offering to be used for any particular purpose, our management will have broad discretion as to the application of the net proceeds from this offering and could use them for purposes other than those contemplated at the time of the offering. Our management may use the net proceeds for corporate purposes that may not improve our financial condition or market value.

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

The offering price per share in this offering may exceed the net tangible book value per share of our common stock outstanding prior to this offering. Assuming that an aggregate of 9,389,671 shares of our common stock are sold at a price of \$2.13 per share, the last reported sale price of our common stock on The NASDAQ Global Market on March 29, 2012 for aggregate gross proceeds of approximately \$20.0 million, and after deducting commissions and estimated aggregate offering expenses payable by us, you will experience immediate dilution of \$1.45 per share, representing the difference between our as adjusted net tangible book value per share as of December 31, 2011 after giving effect to this offering at the assumed size and offering price. The exercise of outstanding stock options and warrants will result in further dilution of your investment. See the section herein entitled "Dilution" for a more detailed illustration of the dilution you would incur if you participate in this offering.

You may experience future dilution as a result of future equity offerings.

In order to raise additional capital, we may in the future offer additional shares of our common stock or other securities convertible into or exchangeable for our common stock at prices that may not be the same as the price per share in this offering. We may sell shares or other securities in any other offering at a price per share that is less than the price per share paid by investors in this offering, and investors purchasing shares or other securities in the future could have rights superior to existing stockholders. The price per share at which we sell additional shares of our common stock, or securities convertible or exchangeable into common stock, in future transactions may be higher or lower than the price per share paid by investors in this offering.

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We intend to use the net proceeds of this offering to fund ongoing and new clinical trials for pimavanserin and our other product candidates, support research and preclinical development activities for our potential product candidates, and for general corporate purposes, including working capital. The timing and amount of our actual expenditures will depend significantly on many factors including, but not limited to, the progress in, and costs of, our clinical trials and research and development activities, and the amount and timing of revenues from our current or potential future collaborations.

We have not determined the amounts we plan to spend on any of the areas indicated above or the timing of these expenditures. As a result, our management will have broad discretion to allocate the net proceeds from this offering. Pending the application of the net proceeds, we intend to invest the net proceeds in investment-grade, interest-bearing securities or guaranteed obligations of the United States government or other securities. Our management will have significant flexibility in applying the net proceeds of this offering and could use these proceeds for corporate purposes that do not improve our financial condition or our market value, or in ways with which our stockholders may not agree. Investors will be relying on the judgment of our management regarding the application of the proceeds of this offering. We may use the net proceeds for corporate purposes that do not yield a significant return or any return for our stockholders, which may cause our stock price to decline.

DILUTION

If you invest in this offering, your ownership interest will be diluted to the extent of the difference between the public offering price per share and the as adjusted net tangible book value per share after giving effect to this offering. We calculate net tangible book value per share by dividing our net tangible book value, which is tangible assets less total liabilities, by the number of outstanding shares of our common stock. Dilution represents the difference between the portion of the amount per share paid by purchasers of shares in this offering and the as adjusted net tangible book value per share of our common stock immediately after giving effect to this offering. Our net tangible book value as of December 31, 2011 was approximately \$23.4 million, or \$0.44 per share.

After giving effect to the sale of our common stock in the aggregate amount of \$20.0 million at an assumed offering price of \$2.13 per share, the last reported sale price of our common stock on The NASDAQ Global Market on March 29, 2012, and after deducting estimated offering commissions and expenses payable by us, our net tangible book value as of December 31, 2011 would have been \$42.6 million, or \$0.68 per share of common stock. This represents an immediate increase in the net tangible book value per share of \$0.24 to our existing stockholders and an immediate dilution in net tangible book value of \$1.45 per share to new investors. The following table illustrates this per share dilution:

| | |
|---|---------|
| Assumed public offering price per share | \$ 2.13 |
| Net tangible book value per share as of December 31, 2011 | \$ 0.44 |
| Increase in net tangible book value per share attributable to this offering | \$ 0.24 |
| As adjusted net tangible book value per share as of December 31, 2011, after giving effect to this offering | \$ 0.68 |
| Dilution per share to new investors purchasing shares in this offering | \$ 1.45 |

The table above assumes for illustrative purposes that an aggregate of 9,389,671 shares of our common stock are sold at a price of \$2.13 per share, the last reported sale price of our common stock on The NASDAQ Global Market on March 29, 2012, for aggregate gross proceeds of approximately \$20.0 million. The shares sold in this offering, if any, will be sold from time to time at various prices. An increase of \$0.10 per share in the price at which the shares are sold from the assumed offering price of \$2.13 per share shown in the table above, assuming all of our common stock in the aggregate amount of \$20.0 million is sold at that price, would result in an increase to our adjusted net tangible book value per share after the offering to \$0.69 and an increase in the dilution in net tangible book value per share to new investors in this offering to \$1.54 per share, after deducting commissions and estimated offering expenses payable by us. A decrease of \$0.10 per share in the price at which the shares are sold from the assumed offering price of \$2.13 per share shown in the table above, assuming all of our common stock in the aggregate amount of \$20.0 million is sold at that price, would result in an immaterial change to our adjusted net tangible book value per share after the offering and a decrease in the dilution in net tangible book value per share to new investors in this offering to \$1.35 per share, after deducting commissions and estimated offering expenses payable by us. This information is supplied for illustrative purposes only.

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The above discussion and table are based on 52,898,659 shares of our common stock issued and outstanding as of December 31, 2011 and excludes the following, all as of December 31, 2011:

5,789,777 shares of common stock issuable upon the exercise of outstanding stock options with a weighted-average exercise price of \$3.39 per share;

4,397,904 shares of common stock issuable upon the exercise of outstanding warrants with an exercise price of \$1.38 per share;

220,000 shares of common stock issuable upon the exercise of outstanding warrants with an exercise price of \$3.915 per share;

74,073 shares of common stock issuable upon the exercise of outstanding warrants with an exercise price of \$8.10 per share;

2,507,461 shares of common stock reserved for future grants under our stock option plans; and

362,115 shares of common stock reserved for future issuance under our 2004 Employee Stock Purchase Plan.

To the extent that options or warrants outstanding as of December 31, 2011 have been or are exercised, or other shares are issued, investors purchasing shares in this offering could experience further dilution. In addition, we may choose to raise additional capital due to market conditions or strategic considerations, even if we believe we have sufficient funds for our current or future operating plans. To the extent that additional capital is raised through the sale of equity or convertible debt securities, the issuance of these securities could result in further dilution to our stockholders.

DIVIDEND POLICY

We have never declared or paid dividends on our common stock. We currently expect to retain future earnings, if any, for use in the operation and expansion of our business and do not anticipate paying any cash dividends in the foreseeable future. Any future determination to pay dividends on our common stock is subject to the discretion of our Board of Directors and will depend upon various factors, including, without limitation, our results of operations and financial condition.

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PLAN OF DISTRIBUTION

We have entered into an At-The-Market Issuance Sales Agreement with MLV under which we may issue and sell our common stock having aggregate sales proceeds of up to \$20.0 million from time to time through MLV acting as agent, subject to certain limitations, including the number of shares registered under the registration statement to which this prospectus supplement relates. The form of the sales agreement will be filed as an exhibit to a report filed under the Exchange Act and incorporated by reference in this prospectus supplement. The sales, if any, of shares made under the sales agreement will be made by any method that is deemed an at-the-market offering as defined in Rule 415 promulgated under the Securities Act of 1933, as amended, including by means of ordinary brokers transactions at market prices, in block transactions or as otherwise agreed by MLV and us. We may instruct MLV not to sell common stock if the sales cannot be effected at or above the price designated by us from time to time. We or MLV may suspend the offering of common stock upon notice and subject to other conditions. As an agent, MLV will not engage in any transactions that stabilize the price of our common stock.

Each time we wish to issue and sell common stock under the sales agreement, we will notify MLV of the number of shares to be issued, the dates on which such sales are anticipated to be made, any minimum price below which sales may not be made and other sales parameter as we deem appropriate. Once we have so instructed MLV, unless MLV declines to accept the terms of the notice, MLV has agreed to use its commercially reasonable efforts consistent with its normal trading and sales practices to sell such shares up to the amount specified on such terms. The obligations of MLV under the sales agreement to sell our common stock is subject to a number of conditions that we must meet.

We will pay MLV commissions for its services in acting as agent in the sale of common stock. MLV will be entitled to compensation at a fixed commission rate of 3% of the gross sales price per share sold. In addition, we have agreed to reimburse certain expenses of MLV in an amount not to exceed \$25,000. We estimate that the total expenses for the offering, excluding compensation payable to MLV under the terms of the sales agreement, will be approximately \$150,000.

Settlement for sales of common stock will occur on the third business day following the date on which any sales are made, or on some other date that is agreed upon by us and MLV in connection with a particular transaction, in return for payment of the net proceeds to us. There is no arrangement for funds to be received in an escrow, trust or similar arrangement.

MLV will act as sales agent on a reasonable efforts basis. In connection with the sale of the common stock on our behalf, MLV may, and will with respect to sales effected in an at the market offering, be deemed to be an underwriter within the meaning of the Securities Act and the compensation of MLV may be deemed to be underwriting commissions or discounts. We have agreed to provide indemnification and contribution to MLV against certain civil liabilities, including liabilities under the Securities Act. We have also agreed to reimburse MLV for certain other specified expenses.

The offering pursuant to the sales agreement will terminate upon the earlier of (i) the third anniversary of the date of the agreement; (ii) the sale of all common shares subject to the agreement, or (iii) termination of the sales agreement as permitted therein.

MLV and its affiliates may in the future provide various investment banking and other financial services for us and our affiliates, for which services they may in the future receive customary fees. To the extent required by Regulation M, MLV will not engage in any market making activities involving our common stock while the offering is ongoing under this prospectus supplement.

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LEGAL MATTERS

Cooley LLP, San Diego, California, will pass upon the validity of the issuance of the shares being sold in this offering. LeClairRyan, A Professional Corporation, New York, New York, is counsel for MLV in connection with this offering.

EXPERTS

The financial statements and management's assessment of the effectiveness of internal control over financial reporting (which is included in Management's Report on Internal Control over Financial Reporting) incorporated in this prospectus supplement by reference to the Annual Report on Form 10-K for the year ended December 31, 2011 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and we file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement under the Securities Act with respect to the common stock offered hereby. This prospectus supplement, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits which are part of the registration statement. For further information with respect to us and the common stock offered by this prospectus supplement, we refer you to the registration statement and the exhibits filed as part of the registration statement. Our SEC filings are available to the public from the SEC's website at www.sec.gov. We maintain a website at www.acadia-pharm.com. Information contained on, or that can be accessed through, our website is not a part of this prospectus supplement.

INCORPORATION OF CERTAIN DOCUMENTS BY REFERENCE

The SEC allows us to incorporate by reference the information we file with it, which means that we can disclose important information to you by referring to those documents. The information incorporated by reference is an important part of this prospectus supplement, and information that we file later with the SEC will automatically update and supersede this information. We incorporate by reference the following documents we filed or will file with the SEC:

Annual Report on Form 10-K for the fiscal year ended December 31, 2011, as filed with the SEC on March 6, 2012;

Current Report on Form 8-K filed on March 5, 2012;

Description of our common stock contained in our registration statement on Form 8-A dated May 19, 2004; and

All documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act after the date of this prospectus supplement and before the termination of the offering under this prospectus supplement.

You may access our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, proxy statement and amendments to those documents filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act with the SEC free of charge at the SEC's website or our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. Information contained on, or that can be accessed through, our website is not a part of this prospectus supplement.

You may request a copy of our SEC filings at no cost, by telephoning or writing us at the following address:

Investor Relations

ACADIA Pharmaceuticals Inc.

3911 Sorrento Valley Boulevard

San Diego, CA 92121

(858) 558-2871

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PROSPECTUS

Common Stock

We may from time to time sell up to 20,000,000 shares of our common stock, \$0.0001 par value per share. You should read this prospectus and any supplement carefully before you invest.

Our common stock is listed on The Nasdaq Global Market under the symbol ACAD . On December 22, 2011, the last reported sale price for our common stock was \$1.32. You are encouraged to obtain current market quotations for shares of our common stock.

Our principal executive offices are located at 3911 Sorrento Valley Boulevard, San Diego, California 92121, and our telephone number at that address is (858) 558-2871.

Investing in our common stock involves a high degree of risk. See Risk Factors on page 1.

As of December 22, 2011, the aggregate market value of our outstanding common stock held by non-affiliates, or the public float, was approximately \$69.5 million, which was calculated based on approximately 52.7 million shares of our outstanding common stock held by non-affiliates and on a price of \$1.32 per share, the last reported sale price for our common stock on December 22, 2011. Pursuant to General Instruction I.B.6 of Form S-3, in no event will we sell our common stock in a public primary offering with a value exceeding one-third of our public float in any 12-month period unless our public float subsequently rises to \$75.0 million or more. We have not offered any securities pursuant to General Instruction I.B.6 of Form S-3 during the 12 calendar months prior to and including the date of this prospectus.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved 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 January 6, 2012.

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ABOUT THIS PROSPECTUS

You should rely only on the information contained or incorporated by reference in this prospectus and any related prospectus supplement. We have not authorized anyone to provide you with different information. No one is making offers to sell or seeking offers to buy these shares of our common stock in any jurisdiction where the offer or sale is not permitted. You should assume that the information contained in this prospectus and any prospectus supplement is accurate only as of the date on the front of this prospectus or the prospectus supplement, as applicable, and that any information we have incorporated by reference in this prospectus or any prospectus supplement is accurate only as of the date given in the document incorporated by reference, regardless of the time of delivery of this prospectus, any applicable prospectus supplement or any sale of our common stock. Our business, financial condition, results of operations and prospects may have changed since that date.

References in this prospectus to ACADIA, the Company, we, us and our refer to ACADIA Pharmaceuticals Inc., together with our wholly-owned subsidiaries.

ACADIA is our trademark. This prospectus also includes trademarks and trade names owned by other parties, and these trademarks and trade names are the property of their respective owners. Use or display by us of other parties' trademarks, trade dress or products in this prospectus is not intended to, and does not imply a relationship with, or endorsements or sponsorship of, us by the trademark or trade dress owners.

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ACADIA PHARMACEUTICALS INC.

We are a biopharmaceutical company utilizing innovative technology to fuel drug discovery and clinical development of novel treatments for central nervous system disorders. We have four product candidates in clinical development including pimavanserin, which is in Phase III development as a potential first-in-class treatment for Parkinson's disease psychosis. We hold worldwide commercialization rights to pimavanserin. We also have a product candidate in Phase II development for chronic pain and a product candidate in Phase I development for glaucoma, both in collaboration with Allergan, Inc., and AM-831 in Phase I development for schizophrenia in collaboration with Meiji Seika Pharma Co., Ltd. All of the product candidates in our pipeline emanate from discoveries made using our proprietary drug discovery platform.

We were incorporated in Delaware in January 1997. Our website address is www.acadia-pharm.com. The information contained in, or that can be accessed through, our website is not part of this prospectus.

RISK FACTORS

An investment in our common stock is risky. Prior to making a decision about investing in our common stock, you should carefully consider the specific risks discussed under "Risk Factors" in any applicable prospectus supplement and in our filings with the Securities and Exchange Commission, or SEC, incorporated by reference in this prospectus, together with all of the other information contained in this prospectus and any applicable prospectus supplement or incorporated by reference in this prospectus. The risks and uncertainties described in any applicable prospectus supplement and in our SEC filings are not the only ones facing us. Additional risks and uncertainties not presently known to us, or that we currently see as immaterial, may also harm our business. If any of the risks or uncertainties described in any applicable prospectus supplement or our SEC filings or any such additional risks and uncertainties actually occur, our business, results of operations and financial condition could be materially and adversely affected. In that case, the trading price of our common stock could decline, and you might lose all or part of your investment.

NOTE REGARDING FORWARD-LOOKING STATEMENTS

This prospectus contains, and the documents incorporated by reference herein and any prospectus supplement hereto may contain, 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. These statements relate to future events or to our future financial performance and involve known and unknown risks, uncertainties and other factors which may cause our actual results, performance or achievements to be materially different from any future results, performances or achievements expressed or implied by the forward-looking statements. Forward-looking statements may include, but are not limited to statements about:

the progress or timing of clinical trials involving our drug candidates;

the benefits to be derived from our drug candidates or the design of our clinical trials;

the progress of our research and development programs;

the benefits to be derived from relationships with our collaborators;

the receipt of regulatory clearances and approvals;

our estimates of future payments, revenues and profitability; and

our estimates regarding our capital requirements and our need for additional financing.

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In some cases, you can identify forward-looking statements by terms such as may, will, should, could, would, expects, plans, anticipates, believes, estimates, projects, predicts, potential and similar expressions intended to identify forward-looking statements. These statements represent our current views with respect to future events and are based on assumptions and subject to risks and uncertainties. Given these uncertainties, you should not place undue reliance on these forward-looking statements. We discuss many of these risks in greater detail under the heading Risk Factors in our SEC filings, and may provide additional information in any applicable prospectus supplement. Also, these forward-looking statements represent our estimates and assumptions only as of the date of the document containing the applicable statement.

You should read this prospectus, the registration statement of which this prospectus is a part, the documents incorporated by reference herein, and any applicable prospectus supplement completely and with the understanding that our actual future results may be materially different from what we expect. We qualify all of the forward-looking statements in the foregoing documents by these cautionary statements.

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You should rely only on the information contained, or incorporated by reference, in this prospectus and any applicable prospectus supplement. We have not authorized anyone to provide you with different information. The common stock offered under this prospectus is not being offered in any state where the offer is not permitted. You should not assume that the information provided by this prospectus or any prospectus supplement is accurate as of any date other than the date on the front of this prospectus or the prospectus supplement, as applicable, or that any information incorporated by reference in this prospectus or in any prospectus supplement is accurate as of any date other than the date given in the document incorporated by reference. Unless required by law, we undertake no obligation to update or revise any forward-looking statements to reflect new information or future events or developments. Thus, you should not assume that our silence over time means that actual events are bearing out as expressed or implied in such forward-looking statements.

USE OF PROCEEDS

We will retain broad discretion over the use of the net proceeds from the sale of our common stock offered under this prospectus. Unless we indicate otherwise in the applicable prospectus supplement, we anticipate that any net proceeds will be used for working capital and general corporate purposes. We will set forth in the applicable prospectus supplement our intended use for the net proceeds received from the sale of any common stock sold pursuant to that prospectus supplement.

PLAN OF DISTRIBUTION

We may sell the common stock to one or more underwriters for public offering and sale by them and may also sell the common stock to investors directly or through agents. We will name any underwriter or agent involved in the offer and sale of common stock in the applicable prospectus supplement. We have reserved the right to sell or exchange our common stock directly to investors on our own behalf in those jurisdictions where we are authorized to do so.

We may distribute the common stock from time to time in one or more transactions:

at a fixed price or prices, which may be changed;

at market prices prevailing at the time of sale;

at prices related to such prevailing market prices; or

at negotiated prices.

We may also, from time to time, authorize dealers, acting as our agents, to offer and sell the common stock upon the terms and conditions set forth in the applicable prospectus supplement. We, or the purchasers of the common stock for whom the underwriters may act as agents, may compensate underwriters in the form of underwriting discounts or commissions, in connection with the sale of the common stock. Underwriters may sell the common stock to or through dealers, and those dealers may receive compensation in the form of discounts, concessions or commissions from the underwriters and/or commissions from the purchasers for whom they may act as agent. Unless otherwise indicated in the applicable prospectus supplement, an agent will be acting on a best efforts basis and a dealer will purchase the common stock as a principal, and may then resell the common stock at varying prices to be determined by the dealer.

We will describe in the applicable prospectus supplement any compensation we pay to underwriters or agents in connection with the offering of our common stock, and any discounts, concessions or commissions allowed by underwriters to participating dealers. Dealers and agents participating in the distribution of the common stock may be deemed to be underwriters, and any discounts and commissions received by them and any profit realized by them on resale of the common stock may be deemed to be underwriting discounts and commissions. We may enter into agreements to indemnify underwriters, dealers and agents against certain civil liabilities, including liabilities under the Securities Act and to reimburse these persons for certain expenses. We may grant underwriters who participate in the distribution of the common stock we are offering under this prospectus an option to purchase additional shares to cover over-allotments, if any, in connection with the distribution.

To facilitate the offering of our common stock, certain persons participating in the offering may engage in transactions that stabilize, maintain, or otherwise affect the price of the common stock. This may include over- allotments or short sales of the common stock, which involve the sale

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by persons participating in the offering of more common stock than we sold to them. In these circumstances, these persons would cover such over-allotments or short positions by making purchases in the open market or by exercising their over-allotment option, if any. In addition, these persons may stabilize or maintain the price of the common stock by bidding for or purchasing common stock in the open market or by imposing penalty bids, whereby selling concessions allowed to dealers participating in the offering may be reclaimed if the common stock sold by them is repurchased in connection with stabilization transactions. The effect of these transactions may be to stabilize or maintain the market price of the common stock at a level above that which might otherwise prevail in the open market. These transactions may be discontinued at any time.

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Certain underwriters, dealers or agents and their associates may engage in transactions with and perform services for us in the ordinary course of our business.

LEGAL MATTERS

Cooley LLP, San Diego, California, has given its opinion to us as to certain legal matters relating to the validity of the shares of our common stock to be offered by this prospectus. Any underwriters will be advised about the other issues relating to any offering by their own legal counsel.

EXPERTS

The financial statements incorporated in this prospectus by reference to the Annual Report on Form 10-K for the year ended December 31, 2010 have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

WHERE YOU CAN FIND MORE INFORMATION

We are a reporting company and we file annual, quarterly and current reports, proxy statements and other information with the SEC. We have filed with the SEC a registration statement under the Securities Act with respect to the common stock offered hereby. This prospectus, which constitutes a part of the registration statement, does not contain all of the information set forth in the registration statement or the exhibits which are part of the registration statement. For further information with respect to us and the common stock offered by this prospectus, we refer you to the registration statement and the exhibits filed as part of the registration statement. You may read and copy any document we file at the SEC's Public Reference Room at 100 F Street, N.E., Washington, D.C. 20549. Please call the SEC at 1-800-SEC-0330 for further information on the Public Reference Room. Our SEC filings are also available to the public from the SEC's website at www.sec.gov. We maintain a website at www.acadia-pharm.com. The information contained in, or that can be accessed through, our website is not part of this prospectus.

The SEC allows us to incorporate by reference the information we file with it, which means that we can disclose important information to you by referring to those documents. The information incorporated by reference is an important part of this prospectus, and information that we file later with the SEC will automatically update and supersede this information. We incorporate by reference the following documents we filed with the SEC pursuant to Section 13 of the Exchange Act:

Annual Report on Form 10-K for the fiscal year ended December 31, 2010 (including information specifically incorporated by reference into our Form 10-K from our Proxy Statement for our 2011 Annual Meeting of Stockholders);

Quarterly Reports on Form 10-Q for the quarters ended March 31, June 30, and September 30, 2011;

Current Reports on Form 8-K filed on January 12, April 1, April 11, June 14, and December 9, 2011;

Description of our common stock contained in our registration statement on Form 8-A dated May 19, 2004; and

All documents filed by us with the SEC pursuant to Sections 13(a), 13(c), 14 or 15(d) of the Exchange Act (i) after the date of the initial filing of the registration statement to which this prospectus relates and prior to effectiveness of the registration statement or (ii) after the date of this prospectus and before the last offering of common stock under this prospectus (excluding any portion of such documents which are furnished and not filed with the SEC).

You may access our annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, Proxy Statement, and amendments to those documents, if any, filed or furnished pursuant to Section 13(a) or 15(d) of the Exchange Act with the SEC free of charge at the SEC's website or our website as soon as reasonably practicable after such material is electronically filed with, or furnished to, the SEC. The reference to our website does not constitute incorporation by reference of the information contained in our website. We do not consider

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information contained on, or that can be accessed through, our website to be part of this prospectus or the related registration statement.

You may request a copy of our SEC filings at no cost, by telephoning or writing us at the following address:

Investor Relations

ACADIA Pharmaceuticals Inc.

3911 Sorrento Valley Boulevard

San Diego, CA 92121

(858) 558-2871

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\$20,000,000

Common Stock

Prospectus Supplement

March 30, 2012