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

**POST-EFFECTIVE AMENDMENT NO. 4
to
FORM S-1
REGISTRATION STATEMENT
UNDER THE SECURITIES ACT OF 1933**

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

Delaware
*(State or other jurisdiction of
incorporation or organization)*

2834
*(Primary Standard Industrial
Classification Code Number)*

84-1318182
*(I.R.S. Employer
Identification Number)*

**12390 El Camino Real, Suite 150
San Diego, CA 92130
(858) 552-0866**
*(Address, including zip code, and telephone number, including
area code, of registrant's principal executive offices)*

Patrick L. Keran
President and Chief Operating Officer
ADVENTRX Pharmaceuticals, Inc.
12390 El Camino Real, Suite 150
San Diego, CA 92130
Telephone: (858) 552-0866
*(Name, address, including zip code, and telephone number,
including area code, of agent for service)*

With a Copy to:

Michael S. Kagnoff
DLA Piper LLP (US)
4365 Executive Drive, Suite 1100
San Diego, CA 92121
Telephone: (858) 677-1400
Facsimile: (858) 677-1401

Robert F. Charron, Esq.
Weinstein Smith LLP
420 Lexington Ave.
New York, NY 10170
Telephone: (212) 616-3007
Facsimile: (212) 869-2249

Harvey J. Keshner, Esq.
Sichenzia Ross Friedman Ference LLP
61 Broadway, Suite 3200
New York, NY 10006
Telephone: (212) 930-9700
Facsimile: (212) 930-9725

Approximate date of commencement of proposed sale to the public: As soon as practicable after the effective date of this Registration Statement.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933 check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, please check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective statement for the same offering.

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer

Smaller reporting company

The registrant hereby amends this registration statement on such date or dates as may be necessary to delay its effective date until the registrant shall file a further amendment which specifically states that this registration statement shall thereafter become effective in accordance with Section 8(a) of the Securities Act of 1933, as amended, or until the registration statement shall become effective on such date as the Securities and Exchange Commission, acting pursuant to said Section 8(a), may determine.

EXPLANATORY NOTE

On October 6, 2009, the Securities and Exchange Commission (the “SEC”) declared effective the Registration Statement on Form S-1 (File No. 333-160778) and the Registration Statement on Form S-1 (File No. 333-162361), which were amended by Post-Effective Amendment No. 1, declared effective by the SEC on March 23, 2010 (together, the “Registration Statement”) of ADVENTRX Pharmaceuticals, Inc. (the “Company”). This Post-Effective Amendment No. 4 to Form S-1 (the “Post Effective Amendment”) is being filed to include an updated prospectus relating to the offering and sale of common stock upon exercise of the outstanding warrants that were originally registered under and issued pursuant to the Registration Statement. No additional securities are being registered under this Post-Effective Amendment. All applicable registration fees were paid at the time of the original filing of the Registration Statement.

The information in this prospectus is not complete and may be changed. We may not sell these securities until the registration statement filed with the Securities and Exchange Commission is effective. This prospectus is not an offer to sell these securities and it is not soliciting an offer to buy these securities in any state where the offer or sale is not permitted.

Prospectus

Filed pursuant to Rule 424(b)(3)
Registration Statement Nos. 333-160778
333-162361

PRELIMINARY AND SUBJECT TO COMPLETION, DATED MAY 10, 2011

ADVENTRX PHARMACEUTICALS, INC.

216,000 Shares of Common Stock upon Exercise of Warrants

Pursuant to a prospectus dated October 6, 2009, we previously offered up to \$11,283,000 of our 4.25660% Series D Convertible Preferred Stock, or 11,283 shares based on a stated value of \$1,000 per share, and warrants to purchase up to 792,000 shares of our common stock. Delivery of the convertible preferred stock and warrants was made on or about October 9, 2009. In addition, pursuant to that prospectus, as subsequently supplemented, 3,192,000 shares of our common stock issuable upon conversion of the convertible preferred stock and exercise of the warrants were registered to permit their issuance by us to the purchasers of our convertible preferred stock and warrants. All 11,283 shares of the convertible preferred stock have been converted into shares of our common stock and we did not receive any proceeds upon conversion of the convertible preferred stock. Holders of the warrants have exercised warrants for 576,000 shares of our common stock, and these warrants are no longer outstanding. Warrants to purchase up to 216,000 shares of our common stock remain outstanding as of the date of this prospectus. The warrants, which have an exercise price of \$3.67 per share, are currently exercisable and may be exercised at any time on or before October 9, 2014. This prospectus relates to the issuance of shares of common stock pursuant to the exercise of the remaining warrants to purchase up to 216,000 shares of our common stock.

Investing in our securities involves a high degree of risk. Before buying any of our securities, you should read the discussion of material risks of investing in our securities in “Risk Factors” beginning on page 3 of this prospectus.

You should rely only on the information contained in this prospectus (including any information which is incorporated by reference into this prospectus) and any free writing prospectus prepared by us or on our behalf. We have not authorized anyone to provide you with different or additional information. If anyone provides you with different or additional information, you should not rely on it.

Our common stock is listed on the NYSE Amex under the symbol “ANX.” The last reported sale price of our common stock on the NYSE Amex on May 9, 2011 was \$2.58 per share. All common stock share and per share amounts in this prospectus have been adjusted to reflect the effect of the 1-for-25 reverse split of our common stock, effected on April 23, 2010. We do not intend to list the warrants on any securities exchange.

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 _____, 2011.

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PROSPECTUS SUMMARY

This summary highlights certain information contained elsewhere in this prospectus and the documents incorporated herein by reference. Because this is only a summary, it does not contain all of the information you should consider before investing in our common stock. You should read this entire prospectus and the documents incorporated herein and therein carefully, especially the discussion of “Risk Factors” and our financial statements and the related notes, before making an investment decision.

Our Company

We are a specialty pharmaceutical company focused on acquiring, developing and commercializing proprietary product candidates. Two of our lead product candidates, Exelbine™, or ANX-530 (vinorelbine injectable emulsion) and ANX-514 (docetaxel emulsion for injection), are novel emulsion formulations of currently marketed chemotherapy drugs. Our other lead product candidate, ANX-188, is a novel, purified, rheologic and antithrombotic compound, which we initially are developing as a first-in-class treatment for pediatric patients with sickle cell disease in acute crisis.

In November 2010, we submitted a new drug application, or NDA, for Exelbine to the U.S. Food and Drug Administration, or FDA, and in January 2011, we announced that the FDA accepted the Exelbine NDA for filing and established a Prescription Drug User Fee Act, or PDUFA, goal date of September 1, 2011 to finish its review of the Exelbine NDA.

In February 2011, we met with the FDA to discuss ANX-514 and the data package we presented to the FDA to support approval of ANX-514 based on data from our bioequivalence study of ANX-514. The FDA indicated that a randomized safety study comparing ANX-514 and Taxotere®, a branded formulation of docetaxel, would be required to support approval of ANX-514. The study would be primarily descriptive but with a sample size sufficient to demonstrate a comparable safety profile. The FDA recommended that the study also collect data on response rate and duration of response. We are developing a study protocol for submission to the FDA and intend to continue discussions with the FDA regarding the phase 3 clinical study and requirements for ANX-514’s approval.

In April 2011, we completed our acquisition of SynthRx, Inc., a privately-held company, pursuant to the Agreement and Plan of Merger, dated February 12, 2011, by and among us, SRX Acquisition Corporation, a wholly owned subsidiary of ours, SynthRx and an individual who was a principal stockholder of SynthRx, and SynthRx became a wholly owned subsidiary of ours. SynthRx’s lead product candidate is a novel, purified, rheologic and antithrombotic compound, poloxamer 188, which we are developing as ANX-188.

For a complete description of our company, see “Part I — Item 1. Business” of our Annual Report on Form 10-K for the fiscal year ended December 31, 2010 (the “Annual Report”). Our principal executive offices are at 12390 El Camino Real, Suite 150, San Diego, CA 92130, and our telephone number is (858) 552-0866.

THE OFFERING

Securities offered	216,000 shares of common stock issuable upon exercise of the warrants issued in connection with units sold on October 9, 2010.
Exercise price	The warrants have an exercise price of \$3.67 per share.
Term of warrants	The warrants are exercisable at any time on or prior to October 9, 2014.
Use of proceeds	We currently intend to use the net proceeds from this offering to pursue development, regulatory approval and commercialization of our product candidates, fund activities relating to acquiring, developing and commercializing additional technologies, product candidates or products, and for general corporate purposes, see “Use of Proceeds.”
Risk factors	You should read the “Risk Factors” section of, and all of the other information set forth in, this prospectus and the documents incorporated herein by reference for a discussion of factors to consider carefully before deciding to invest in our securities.
NYSE Amex equities market symbol	“ANX”

RISK FACTORS

Investing in our securities involves a high degree of risk. You should carefully consider the risk factors set forth under “Risk Factors” in Item 1A of the Annual Report, which is incorporated by reference in this prospectus, together with all other information contained or incorporated by reference in this prospectus, as may be updated by our subsequent filings under the Securities Exchange Act of 1934, as amended, or the Exchange Act, and the risk factors and other information contained in any applicable prospectus supplement, in any related free writing prospectus in connection with a specific offering and subsequent filings that we make with the Securities and Exchange Commission (“SEC”) before deciding whether to purchase any of the securities being registered pursuant to the registration statement of which this prospectus is a part. Each of the risk factors could adversely affect our business, operating results and financial condition, as well as adversely affect the value of an investment in our securities, and the occurrence of any of these risks might cause you to lose all or part of your investment.

USE OF PROCEEDS

In the event of full cash exercise of all of the warrants, we will receive additional net proceeds of approximately \$792,720. The actual exercise of any of the warrants, however, is beyond our control and depends on a number of factors, including the market price of our common stock. There can be no assurance that any of the warrants will be exercised. While we have no specific plan for the proceeds, we currently intend to use the net proceeds from this offering to pursue development, regulatory approval and commercialization of our product candidates, fund activities relating to acquiring, developing and commercializing additional technologies, product candidates or products and for general corporate purposes. The principal reason for this offering is to provide shares of common stock upon exercise of the outstanding warrants that were issued in connection with a prior offering of units consisting of our 4.25660% Series D Convertible Preferred Stock and common stock purchase warrants.

DESCRIPTION OF SECURITIES

The shares of our common stock issued upon the exercise, if any, of the warrants previously issued to the investors in the offering will be issued pursuant to the warrants between each of the investors and us. We urge you to review the form of the warrant, which we will file as an exhibit to the Registration Statement for a complete description of the terms and conditions applicable to the warrants and underlying common stock. The following brief summary of the material terms and provisions of the warrants and common stock is subject to, and qualified in its entirety by, our amended and restated certificate of incorporation, our amended and restated bylaws and the form of warrant that are incorporated by reference into this Post-Effective Amendment of which this prospectus is a part. The terms of these securities may also be affected by Delaware General Corporation Law.

Warrants

The common stock warrants, which have an exercise price of \$3.67 per share, are currently exercisable and may be exercised at any time on or before October 9, 2014. Subject to limited exceptions, a warrant holder will not have the right to exercise any portion of the warrant if the holder, together with its affiliates, would beneficially own in excess of 4.99% of the number of shares of our common stock outstanding immediately after the exercise.

The exercise price of the warrants, and in some cases the number of shares issuable upon exercise of the warrants, are subject to adjustment in the event of stock splits, stock dividends, combinations and similar events affecting our common stock. The exercise price is also subject to adjustment if we issue rights, options or warrants to all holders of our common stock entitling them to subscribe for or purchase shares of our common stock at a price per share less than the daily volume weighted average price of our common stock or if we distribute evidences of our indebtedness or assets or rights or warrants to subscribe for or purchase any security to all holders of our common stock. In addition, in the event we consummate a fundamental corporate transaction such as a merger or consolidation with or into another person or other reorganization event in which our common stock is converted or exchanged for securities, cash or other property, or we sell, lease, license or otherwise dispose of all or substantially all of our assets or we or another person acquires 50% or more of our outstanding common stock, then following such event, the holders of the warrants will be entitled to receive, for each share that would have been issuable upon exercise of the warrants immediately prior to such fundamental transaction, the number of shares of common stock of the successor or acquiring corporation or of ours, if we are the surviving corporation, and any additional consideration receivable as a result of such fundamental transaction by a holder of the number of shares of common stock for which the warrant is exercisable immediately prior to such fundamental transaction. Any successor to us or surviving entity shall assume our obligations under the warrants.

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The warrant holders must surrender payment in cash of the aggregate 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 due to the ineffectiveness of the registration statement of which this prospectus is a part, then the warrants may only be exercised on a “net” or “cashless” basis. No fractional shares of common stock will be issued in connection with the exercise of a warrant. In lieu of fractional shares, we will pay the holder an amount in cash equal to the fractional amount multiplied by the exercise price.

The warrants do not entitle the holders thereof to any voting rights, dividends or other rights as a stockholder of ours prior to the exercise of the warrants.

We do not intend to list the warrants on any securities exchange or automated quotation system.

Common Stock

We are authorized to issue 500,000,000 shares of common stock, par value \$0.001 per share, of which 26,465,709 shares were issued and outstanding as of May 6, 2011. Additional shares of authorized common stock may be issued, as authorized by our board of directors from time to time, without stockholder approval, except as may be required by applicable securities exchange requirements. The holders of common stock possess exclusive voting rights in us, except to the extent our board of directors specifies voting power with respect to any other class of securities issued in the future. Each holder of our common stock is entitled to one vote for each share held of record on each matter submitted to a vote of stockholders, including the election of directors. Stockholders do not have any right to cumulate votes in the election of directors.

Subject to preferences that may be granted to the holders of preferred stock, each holder of our common stock is entitled to share ratably in distributions to stockholders and to receive ratably such dividends as may be declared by our board of directors out of funds legally available therefor. In the event of our liquidation, dissolution or winding up, the holders of our common stock will be entitled to receive, after payment of all of our debts and liabilities and of all sums to which holders of any preferred stock may be entitled, the distribution of any of our remaining assets. Holders of our common stock have no conversion, exchange, sinking fund, redemption or appraisal rights (other than such as may be determined by our board of directors in its sole discretion) and have no preemptive rights to subscribe for any of our securities.

All of the outstanding shares of our common stock are fully paid and non-assessable. The shares of common stock issued upon the exercise of any of the warrants previously issued pursuant to the Registration Statement, when issued and paid for, will also be, fully paid and non-assessable.

Securities Exchange Listing

Our common stock is traded on the NYSE Amex equities market under the symbol “ANX.”

Transfer Agent and Registrar

The transfer agent and registrar for our common stock is American Stock Transfer & Trust Company, LLC.

EXPERTS

The consolidated financial statements of ADVENTRX Pharmaceuticals, Inc. as of December 31, 2010 and 2009, and the related consolidated statements of operations, stockholders’ equity (deficit) and comprehensive loss and cash flows for the years then ended and for the period from January 1, 2002 through December 31, 2010 are incorporated by reference herein and in the registration statement in reliance upon the report of J.H. Cohn LLP, an independent registered public accounting firm, given on the authority of said firm as experts in accounting and auditing.

WHERE YOU CAN FIND ADDITIONAL INFORMATION

We file annual, quarterly and current reports, proxy statements and other information electronically with the SEC. You may read and copy these reports, proxy statements and other information 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 more information about the operation of the public reference room. You can request copies of these documents by writing to the SEC and paying a fee for the copying costs. The SEC also maintains an Internet site that contains reports, proxy and information statements, and other information regarding issuers that file electronically with the SEC, including us. The SEC's Internet site can be found at <http://www.sec.gov>. In addition, we make available on or through our Internet site copies of these reports as soon as reasonably practicable after we electronically file or furnish them to the SEC. Our corporate Internet site can be found at <http://www.adventrx.com>.

INCORPORATION BY REFERENCE OF CERTAIN DOCUMENTS

The SEC allows us to incorporate by reference the information contained in documents that we file with them. We are incorporating by reference into this prospectus the documents listed below:

- our Annual Report on Form 10-K for the fiscal year ended December 31, 2010 filed with the SEC on March 10, 2011 (File No. 001-32157-11679095);
- our Quarterly Report on Form 10-Q for the quarterly period ended March 31, 2011 filed with the SEC on May 9, 2011 (File No. 001-32157-11823538); and
- our current reports on Form 8-K filed with the SEC on January 6, 2011 (File No. 001-32157-11512917), January 7, 2011 (File No. 001-32157-11515655), January 7, 2011 (File No. 001-32157-11515695), January 19, 2011 (File No. 001-32157-11536324), February 14, 2011 (File No. 001-32157-11604349), February 15, 2011 (File No. 001-32157-11613491), March 22, 2011 (File No. 001-32157-11704394), April 11, 2011 (File No. 001-32157-11752769) and May 9, 2011 (File No. 001-32157-11823649).

By incorporating by reference our Annual Report on Form 10-K, our Quarterly Report on Form 10-Q and our current reports on Form 8-K, we can disclose important information to you by referring to those reports, which are considered part of this prospectus.

Any statement contained in a document incorporated or deemed to be incorporated by reference into this prospectus will be deemed to be modified or superseded for purposes of this prospectus to the extent that a statement contained in this prospectus or any other subsequently filed document that is deemed to be incorporated by reference into this prospectus modifies or supersedes the statement. Any statement so modified or superseded will not be deemed, except as so modified or superseded, to constitute a part of this prospectus .

We will provide each person, including any beneficial owner, to whom a prospectus is delivered, a copy of any or all of the reports or documents that have been incorporated by reference into this prospectus but not delivered with this prospectus upon written or oral request at no cost to the requester. Requests should be directed to: ADVENTRX Pharmaceuticals, Inc., 12390 El Camino Real, Suite 150, San Diego, California 92130, Attn: Investor Relations, telephone: (858) 552-0866. The reports and documents that have been incorporated by reference into this prospectus also may be accessed through our website at <http://www.adventrx.com>.

You may read and copy any materials we file with the SEC at the SEC's Public Reference Room at 100 F Street, N.E., Washington, DC 20549. This prospectus is part of post-effective amendment No. 4 to a registration statement on Form S-1 that we filed with the SEC. That post-effective amendment No. 4 to the registration statement on Form S-1 contains more information than this prospectus regarding us and the securities we offered pursuant to the prospectus, including certain exhibits and schedules. You may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. The SEC also maintains an Internet site that contains reports, proxy and information statements, and other information regarding ADVENTRX at <http://www.sec.gov>.

You should rely only on the information contained in this prospectus or to which we have referred you. We have not authorized any person to provide you with different information or to make any representation not contained in this prospectus.

PART II**INFORMATION NOT REQUIRED IN THE PROSPECTUS****ITEM 13. OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION**

The following table sets forth the fees and expenses incurred or expected to be incurred by us in connection with the issuance and distribution of the securities being registered hereby, other than placement agent fees. All of the amounts shown are estimated except the SEC registration fee. Estimated fees and expenses can only reflect information that is known at the time of filing this registration statement and are subject to future contingencies, including additional expenses for future offerings.

Securities and Exchange Commission registration fee	\$ 629
Transfer agent fees and expenses	15,000
Printing and engraving expenses	30,000
Legal fees and expenses	160,000
Accounting fees and expenses	20,000
Miscellaneous expenses	4,371
Total	\$ 230,000

ITEM 14. INDEMNIFICATION OF DIRECTORS AND OFFICERS

Section 145 of the Delaware General Corporation Law authorizes a corporation to indemnify its directors and officers against liabilities arising out of actions, suits and proceedings to which they are made or threatened to be made a party by reason of the fact of their prior or current service to the Company as a director or officer, in accordance with the provisions of Section 145, which are sufficiently broad to permit indemnification under certain circumstances for liabilities arising under the Securities Act of 1933, as amended (the "Securities Act"). The indemnity may cover expenses (including attorneys' fees) judgments, fines and amounts paid in settlement actually and reasonably incurred by the director or officer in connection with any such action, suit or proceeding. Section 145 permits corporations to pay expenses (including attorneys' fees) incurred by directors and officers in advance of the final disposition of such action, suit or proceeding. In addition, Section 145 provides that a corporation has the power to purchase and maintain insurance on behalf of its directors and officers against any liability asserted against them and incurred by them in their capacity as a director or officer, or arising out of their status as such, whether or not the corporation would have the power to indemnify the director or officer against such liability under Section 145.

Our amended and restated certificate of incorporation provides that, to the fullest extent permitted by the Delaware General Corporation Law, (1) a director shall not be personally liable to ADVENTRX or its stockholders for monetary damages for breach of fiduciary duty as a director, and (2) we shall indemnify any director or officer made a party to an action or proceeding, whether criminal, civil, administrative or investigative, by reason of the fact of such person's current or prior service as a director or officer of ADVENTRX, any predecessor of ADVENTRX or any other enterprise per ADVENTRX's or any predecessor to ADVENTRX's request.

Our amended and restated bylaws provide that (a) we shall indemnify our directors and officers to the maximum extent and in the manner permitted by the Delaware General Corporation Law against expenses (including attorneys' fees), judgments, fines, ERISA excise taxes, settlements and other amounts actually and reasonably incurred in connection with any proceeding, whether civil, criminal, administrative or investigative, arising by reason of the fact that such person is or was an agent of the corporation, subject to certain limited exceptions, (b) we shall advance expenses incurred by any director or officer prior to the final disposition of any proceeding to which the director or officer was or is or is threatened to be made a party promptly following a request therefore, subject to certain limited exceptions, and (c) the rights conferred in our bylaws are not exclusive.

We have entered into indemnification agreements with each of our directors and executive officers to give such directors and officers additional contractual assurances regarding the scope of the indemnification set forth in our certificate of incorporation and bylaws and to provide additional procedural protections. These agreements, among other things, provide that we will indemnify our directors and executive officers for expenses (including attorneys' fees), judgments, fines, penalties and amounts paid in settlement (including all interest, assessments and other charges paid or payable in connection therewith) actually and reasonably incurred by a director or executive officer in connection with any action or proceeding to which such person was, is or is threatened to be made a party, a witness or other participant by reason of such person's services as a director or executive officer of ADVENTRX, any of ADVENTRX's subsidiaries or any other company or enterprise to which the person provides services at ADVENTRX's request, and any federal, state, local or foreign taxes imposed on the director or executive officer as a result of the actual or deemed receipt of any payments under the indemnification agreements.

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In addition, the indemnification agreements provide that, upon the request of a director or executive officer, we shall advance expenses (including attorneys' fees) to the director or officer. We intend to enter into indemnification agreements with any new directors and executive officers in the future.

We have also obtained an insurance policy covering our directors and officers with respect to certain liabilities, including liabilities arising under the Securities Act.

ITEM 15. RECENT SALES OF UNREGISTERED SECURITIES

During the three-year period preceding the date of the filing of this registration statement, we have issued securities in the transactions described below without registration under the Securities Act. These securities were offered and sold by us in reliance upon exemptions from the registration statement requirements provided by Section 4(2) of the Securities Act or Regulation D under the Securities Act as transactions by an issuer not involving a public offering. All common stock share and per share amounts in this prospectus have been adjusted to reflect the effect of the 1-for-25 reverse split of our common stock, effected on April 23, 2010.

On June 12, 2009, in connection with the closing of our registered direct offering of convertible preferred stock and warrants to purchase common stock, we issued to Rodman & Renshaw, LLC, or its designee, as partial consideration for its services as placement agent, warrants to purchase an aggregate of up to 36,071 shares of our common stock at an exercise price of \$3.75 per share. The warrants became exercisable on December 13, 2009 and may be exercised at any time on or before June 12, 2014.

On July 6, 2009, in connection with the closing of our registered direct offering of convertible preferred stock, we issued to Rodman & Renshaw, LLC, or its designee, as partial consideration for its services as placement agent, warrants to purchase an aggregate of up to 19,007 shares of our common stock at an exercise price of \$4.475 per share. The warrants became exercisable on January 7, 2010 and are exercisable at any time on or before July 6, 2014.

On August 10, 2009, in connection with the closing of our registered direct offering of convertible preferred stock, we issued to Rodman & Renshaw, LLC, or its designee, as partial consideration for its services as placement agent, warrants to purchase an aggregate of up to 14,183 shares of our common stock at an exercise price of \$4.0625 per share. The warrants became exercisable on February 10, 2010 and are exercisable at any time beginning on or before August 10, 2014.

On October 9, 2009, in connection with the closing of our registered direct offering of convertible preferred stock and warrants to purchase common stock, we issued to Rodman & Renshaw, LLC, or its designee, as partial consideration for its services as placement agent, warrants to purchase an aggregate of up to 144,000 shares of our common stock at an exercise price of \$5.875 per share. The warrants are exercisable at any time on or after April 7, 2010 and on or before October 6, 2014.

On January 7, 2010, in connection with the closing of our registered direct offering of convertible preferred stock and warrants to purchase common stock, we issued to Rodman & Renshaw, LLC, or its designee, as partial consideration for its services as placement agent, warrants to purchase an aggregate of up to 99,696 shares of our common stock at an exercise price of \$11.9125 per share. The warrants are exercisable at any time on or after July 7, 2010 and on or before June 3, 2014.

On January 11, 2011, in connection with the closing of our registered direct offering of convertible preferred stock and warrants to purchase common stock, we issued to Rodman & Renshaw, LLC, or its designee, as partial consideration for its services as placement agent, warrants to purchase an aggregate of up to 409,228 shares of our common stock at an exercise price of \$3.44 per share. The warrants were exercisable upon issuance and are exercisable at any time on or before April 1, 2015.

On April 8, 2011, in connection with the closing of our acquisition of SynthRx, Inc. and pursuant to the Agreement and Plan of Merger, dated February 12, 2011 (the "Merger Agreement"), by and among our company, SRX Acquisition Corporation, a Delaware corporation and wholly owned subsidiary of ours, SynthRx and, solely with respect to Sections 2 and 8, an individual who was a principal stockholder of SynthRx, we issued to the former stockholders of SynthRx an aggregate of 2,800,851 shares of our common stock as partial consideration for the merger. All shares of SynthRx common stock outstanding immediately prior to the merger were cancelled and automatically converted into the right to receive shares of our common stock pursuant to the terms of the Merger Agreement, including the 2,800,851 shares we issued on April 8, 2011.

ITEM 16. EXHIBITS AND FINANCIAL STATEMENT SCHEDULES

(a) Exhibits

A list of exhibits filed herewith is contained in the exhibit index that immediately precedes such exhibits and is incorporated herein by reference.

(b) Financial Statement Schedules

All financial statement schedules are omitted because they are not applicable, the amounts involved are not significant or the required information is shown in the financial statements or notes thereto.

ITEM 17. UNDERTAKINGS

(a) The undersigned registrant hereby undertakes:

(1) To file, during any period in which offers or sales are being made, a post-effective amendment to this registration statement:

(i) To include any prospectus required by Section 10(a)(3) of the Securities Act of 1933;

(ii) To reflect in the prospectus any facts or events arising after the effective date of the registration statement (or the most recent post-effective amendment thereof) which, individually or in the aggregate, represent a fundamental change in the information set forth in the registration statement. Notwithstanding the foregoing, any increase or decrease in volume of securities offered (if the total dollar value of securities offered would not exceed that which was registered) and any deviation from the low or high end of the estimated maximum offering range may be reflected in the form of prospectus filed with the Commission pursuant to Rule 424(b) if, in the aggregate, the changes in volume and price represent no more than 20 percent change in the maximum aggregate offering price set forth in the "Calculation of Registration Fee" table in the effective registration statement; and

(iii) To include any material information with respect to the plan of distribution not previously disclosed in the registration statement or any material change to such information in the registration statement;

(2) That, for the purpose of determining any liability under the Securities Act of 1933, each such post-effective amendment shall be deemed to be a new registration statement relating to the securities offered therein, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof;

(3) To remove from registration by means of a post-effective amendment any of the securities being registered which remain unsold at the termination of the offering;

(4) That, for the purpose of determining liability under the Securities Act of 1933 to any purchaser:

(A) Each prospectus filed by the registrant pursuant to Rule 424(b)(3) shall be deemed to be part of the registration statement as of the date the filed prospectus was deemed part of and included in the registration statement; and

(B) Each prospectus required to be filed pursuant to Rule 424(b)(2), (b)(5) or (b)(7) as part of a registration statement in reliance on Rule 430B relating to an offering made pursuant to Rule 415(a)(1)(i), (vii) or (x) for the purpose of providing the information required by Section 10(a) of the Securities Act of 1933 shall be deemed to be part of and included in the registration statement as of the earlier of the date such form of prospectus is first used after effectiveness or the date of the first contract of sale of securities in the offering described in prospectus. As provided in Rule 430B, for liability purposes of the issuer and any person that is at that date an underwriter, such date shall be deemed to be a new effective date of the registration statement relating to the securities in the registration statement to which the prospectus relates, and the offering of such securities at that time shall be deemed to be the initial *bona fide* offering thereof. *Provided, however*, that no statement made in a registration statement or prospectus that is part of the registration statement or made in a document incorporated or deemed incorporated by reference into the registration statement or prospectus that is part of the registration statement will, as to a purchaser with a time of contract of sale prior to such effective date, supersede or modify any statement that was made in the registration statement or prospectus that was part of the registration statement or made in any such document immediately prior to such effective date; and

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(5) That, for the purpose of determining liability of the registrant under the Securities Act of 1933 to any purchaser in the initial distribution of the securities, the undersigned registrant undertakes that in a primary offering of securities of the undersigned registrant pursuant to this registration statement, regardless of the underwriting method used to sell the securities to the purchaser, if the securities are offered or sold to such purchaser by means of any of the following communications, the undersigned registrant will be a seller to the purchaser and will be considered to offer or sell such securities to such purchaser:

(i) Any preliminary prospectus or prospectus of the undersigned registrant relating to the offering required to be filed pursuant to Rule 424;

(ii) Any free writing prospectus relating to the offering prepared by or on behalf of the undersigned Registrant or used or referred to by the undersigned registrant;

(iii) The portion of any other free writing prospectus relating to the offering containing material information about the undersigned registrant or its securities provided by or on behalf of an undersigned registrant; and

(iv) Any other communication that is an offer in the offering made by the undersigned registrant to the purchaser.

(b) Insofar as indemnification for liabilities arising under the Securities Act of 1933 may be permitted to directors, officers and controlling persons of the registrant pursuant to the foregoing provisions, or otherwise, the registrant has been advised that in the opinion of the Securities and Exchange Commission such indemnification is against public policy as expressed in the Act and is, therefore, unenforceable. In the event that a claim for indemnification against such liabilities (other than the payment by the registrant of expenses incurred or paid by a director, officer or controlling person of the registrant in the successful defense of any action, suit or proceeding) is asserted by such director, officer or controlling person in connection with the securities being registered, the registrant will, unless in the opinion of its counsel the matter has been settled by controlling precedent, submit to a court of appropriate jurisdiction the question whether such indemnification by it is against public policy as expressed in the Act and will be governed by the final adjudication of such issue.

EXHIBIT INDEX

Exhibit	Description
2.1(1)	Agreement and Plan of Merger, dated April 7, 2006, among the registrant, Speed Acquisition, Inc., SD Pharmaceuticals, Inc. and certain individuals named therein (including exhibits thereto)
2.2†(2)	Agreement and Plan of Merger, dated February 12, 2011, by and among the registrant, SRX Acquisition Corporation, SynthRx, Inc. and, solely with respect to Sections 2 and 8, the Stockholders' Agent
3.1(3)	Amended and Restated Certificate of Incorporation of the registrant
3.2(4)	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the registrant dated October 5, 2009
3.3(5)	Certificate of Amendment to the Amended and Restated Certificate of Incorporation of the registrant, dated April 23, 2010
3.4(6)	Certificate of Designation of Preferences, Rights and Limitations of 0% Series A Convertible Preferred Stock
3.5(7)	Certificate of Designation of Preferences, Rights and Limitations of 5% Series B Convertible Preferred Stock
3.6(8)	Certificate of Designation of Preferences, Rights and Limitations of 5% Series C Convertible Preferred Stock
3.7(9)	Certificate of Designation of Preferences, Rights and Limitations of 4.25660% Series D Convertible Preferred Stock
3.8(10)	Certificate of Designation of Preferences, Rights and Limitations of 3.73344597664961% Series E Convertible Preferred Stock
3.9(11)	Certificate of Designation of Preferences, Rights and Limitations of 2.19446320054018% Series F Preferred Stock
3.10(12)	Amended and Restated Bylaws of the registrant (formerly known as Biokeys Pharmaceuticals, Inc.)
4.1(9)	Form of Securities Purchase Agreement, dated October 6, 2009, governing the issuance and sale of the registrant's 4.25660% Series D Convertible Preferred Stock and 5-year common stock purchase warrants
4.2(9)	Form of Common Stock Purchase Warrant issued on October 9, 2009 by the registrant to the purchasers of the registrant's 4.25660% Series D Convertible Preferred Stock
5.1(17)	Opinion of DLA Piper LLP (US)
10.1(13)	Securities Purchase Agreement, dated July 21, 2005, among the registrant and the Purchasers (as defined therein)
10.2(13)	Rights Agreement, dated July 27, 2005, among the registrant, the Icahn Purchasers and Viking (each as defined therein)
10.3(14)	First Amendment to Rights Agreement, dated September 22, 2006, among the registrant and the Icahn Purchasers (as defined therein)
10.4(15)	Second Amendment to Rights Agreement, dated February 25, 2008, among the registrant and the Icahn Purchasers (as defined therein)
10.5(16)	Third Amendment to Rights Agreement, dated August 26, 2009, among the registrant and Icahn Purchasers (as defined therein)
10.6(13)	Form of \$2.26 Common Stock Warrant issued on July 27, 2005 to Icahn Partners LP, Icahn Partners Master Fund LP, High River Limited Partnership, Viking Global Equities LP and VGE III Portfolio Ltd.
10.7(13)	Form of \$2.26 Common Stock Warrant issued on July 27, 2005 to North Sound Legacy Institutional Fund LLC and North Sound Legacy International Ltd.

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<u>Exhibit</u>	<u>Description</u>
10.8(6)	Engagement Letter Agreement, dated June 7, 2009, by and between the registrant and Rodman & Renshaw, LLC
10.9(6)	Securities Purchase Agreement, date June 8, 2009, governing the issuance and sale of the registrant's 0% Series A Convertible Preferred Stock and 5-year common stock purchase warrants
10.10(6)	Form of Common Stock Purchase Warrant issued on June 12, 2009 by the registrant to the purchasers of the registrant's 0% Series A Convertible Preferred Stock and to Rodman & Renshaw, LLC
10.11(7)	Engagement Letter Agreement, dated June 26, 2009, by and between the registrant and Rodman & Renshaw, LLC
10.12(7)	Securities Purchase Agreement, dated June 29, 2009, governing the issuance and sale of the registrant's 5% Series B Convertible Preferred Stock
10.13(7)	Form of Common Stock Purchase Warrant issued on July 6, 2009 by the registrant to Rodman & Renshaw, LLC
10.14(8)	Engagement Letter Agreement, dated August 4, 2009, by and between the registrant and Rodman & Renshaw, LLC
10.15(8)	Securities Purchase Agreement, dated August 5, 2009, governing the issuance and sale of the registrant's 5% Series C Convertible Preferred Stock
10.16(8)	Form of Common Stock Purchase Warrant issued on August 10, 2009 by the registrant to Rodman & Renshaw, LLC
10.17(17)	Engagement Letter Agreement, dated September 24, 2009, by and between the registrant and Rodman & Renshaw, LLC
10.18(9)	Engagement Letter Agreement, dated September 29, 2009, by and between the registrant and Rodman & Renshaw, LLC
10.19(9)	Form of Common Stock Purchase Warrant issued on October 9, 2009 by the registrant to Rodman & Renshaw, LLC
10.20(10)	Engagement Letter Agreement, dated January 3, 2010, by and between the registrant and Rodman & Renshaw, LLC
10.21(10)	Securities Purchase Agreement, dated as of January 4, 2010, governing the issuance and sale of the registrant's 3.73344597664961% Series E Convertible Preferred Stock and 30-month common stock purchase warrants
10.22(10)	Form of Common Stock Purchase Warrant issued on January 7, 2010 by the registrant to the purchasers of the registrant's 3.73344597664961% Series E Convertible Preferred Stock and to Rodman & Renshaw, LLC
10.23(5)	Engagement Letter Agreement, dated April 29, 2010, by and between the registrant and Rodman & Renshaw, LLC
10.24(5)	Form of Securities Purchase Agreement, dated May 2, 2010 governing the issuance and sale of the registrant's 2.19446320054018% Series F Convertible Preferred Stock and 5-year and 1-year common stock purchase warrants
10.25(5)	Form of Series A and B Common Stock Purchase Warrants issued on May 6, 2010 by the registrant to the purchasers of the registrant's 2.19446320054018% Series F Convertible Preferred Stock
10.26(18)	Engagement Letter Agreement, dated January 5, 2011, by and between the registrant and Rodman & Renshaw, LLC
10.27(18)	Form of Securities Purchase Agreement, dated January 6, 2011 governing the issuance and sale of the registrant's common stock and 5-year and 1-year common stock purchase warrants

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<u>Exhibit</u>	<u>Description</u>
10.28(18)	Form of [Series A/B] Common Stock Purchase Warrant issued on January 11, 2011 by the registrant to the purchasers of the registrant's common stock and to Rodman & Renshaw, LLC
10.29(19)	2005 Equity Incentive Plan
10.30(20)	Form of Stock Option Agreement under the 2005 Equity Incentive Plan
10.31(21)	Form of Stock Option Agreement under the 2005 Equity Incentive Plan (for director option grants beginning in 2008)
10.32(22)	Form of Stock Option Agreement under the 2005 Equity Incentive Plan (for option grants to employees approved in March 2008)
10.33(3)	Form of Restricted Share Award Agreement under the 2005 Equity Incentive Plan
10.34(23)	2008 Omnibus Incentive Plan
10.35(24)	Form of Notice of Grant of Restricted Stock Units under the 2008 Omnibus Incentive Plan (for grants to employees in January 2009)
10.36(24)	Form of Restricted Stock Units Agreement under the 2008 Omnibus Incentive Plan
10.37(25)	Form of Non-Statutory Stock Option Grant Agreement (for directors) under the 2008 Omnibus Incentive Plan
10.38(25)	Form of Non-Statutory/Incentive Stock Option Grant Agreement (for consultants/employees) under the 2008 Omnibus Incentive Plan
10.39(26)	Form of Incentive Stock Option Grant Agreement under the 2008 Omnibus Incentive Plan (for grant to Brian M. Culley in July 2009)
10.40(26)	Form of Incentive Stock Option Grant Agreement under the 2008 Omnibus Incentive Plan (for grant to Patrick L. Keran in July 2009)
10.41(27)	Form of letter, dated January 20, 2010, modifying options granted to Brian M. Culley and Patrick L. Keran in July 2009
10.42(27)	Form of Incentive Stock Option Grant Agreement under the 2008 Omnibus Incentive Plan (for grant to Brian M. Culley in January 2010)
10.43(27)	Form of Incentive Stock Option Grant Agreement under the 2008 Omnibus Incentive Plan (for grant to Patrick L. Keran in January 2010)
10.44(21)	License Agreement, dated December 10, 2005, among SD Pharmaceuticals, Latitude Pharmaceuticals and Andrew Chen, including a certain letter, dated November 20, 2007, clarifying the scope of rights thereunder
10.45(28)	License Agreement, dated March 25, 2009, among the registrant, SD Pharmaceuticals, Inc. and Shin Poong Pharmaceutical Co., Ltd.
10.46(29)	Standard Multi-Tenant Office Lease — Gross, dated June 3, 2004, between the registrant and George V. Casey & Ellen M. Casey, Trustees of the Casey Family Trust dated June 22, 1998
10.47(3)	First Amendment to the Standard Multi-Tenant Office Lease — Gross, dated June 3, 2004 between the registrant and George V. & Ellen M. Casey, Trustees of the Casey Family Trust dated June 22, 1998
10.48(30)	Second Amendment to Standard Mutli-Tenant Office Lease — Gross, dated July 22, 2009, by and among Westcore Mesa View, LLC, DD Mesa View LLC and the registrant
10.49(31)	Third Amendment to Standard Multi-Tenant Office Lease — Gross, dated December 10, 2009, by and among Westcore Mesa View, LLC, DD Mesa View, LLC and the registrant
10.50(32)	Fourth Amendment to Standard Multi-Tenant Office Lease — Gross, dated February 4, 2010, by and among Westcore Mesa View, LLC, DD Mesa View, LLC and the registrant
10.51(33)	Offer letter, dated November 15, 2004, to Brian M. Culley
10.52(24)	Retention and Incentive Agreement, dated January 28, 2009 between the registrant and Brian M. Culley



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<u>Exhibit</u>	<u>Description</u>
10.53#(28)	Retention and Incentive Agreement, dated January 28, 2009, between the registrant and Patrick L. Keran
10.54#(32)	Consulting Agreement, effective as of July 15, 2009, and Amendment to Consulting Agreement, effective as of December 31, 2009, between the registrant and Michele L. Yelmene
10.55#(26)	2009 Mid-Year Incentive Plan for Brian M. Culley and Patrick L. Keran
10.56#(26)	Retention and Severance Plan (as of July 21, 2009) for Brian M. Culley and Patrick L. Keran
10.57#(27)	2010 Incentive Plan for Brian M. Culley and Patrick L. Keran
10.58#(32)	Consulting Agreement, effective as of November 23, 2009, between the registrant and Eric K. Rowinsky
10.59#(34)	Director Compensation Policy, adopted June 21, 2006
10.60#(32)	Director Compensation Policy, adopted January 25, 2010
10.61(35)	Form of Director and Officer Indemnification Agreement
10.62#(36)	Offer letter, dated February 11, 2011, to Brandi L. Roberts
10.63†(2)	Stockholders' Voting and Transfer Restriction Agreement, dated February 12, 2011, by and among the registrant, each of the principal stockholders of SynthRx, Inc. and, solely with respect to Section 3(c), the Stockholders' Agent
10.64†(2)	License Agreement, dated June 8, 2004, between SynthRx, Inc. and CytRx Corporation, as amended by that certain Letter Agreement Re: Amendment to License Agreement, dated August 3, 2006, and that certain Agreement and Amendment No. 2 to License Agreement, dated December 1, 2010
10.65#(37)	Incentive Stock Option Grant Agreement under the 2008 Omnibus Incentive Plan, effective as of February 1, 2011, by and between the registrant and Brian M. Culley
10.66#(37)	Incentive Stock Option Grant Agreement under the 2008 Omnibus Incentive Plan, effective as of February 1, 2011, by and between the registrant and Patrick L. Keran
10.67#(37)	Director Compensation Policy, adopted March 16, 2011
10.68#(37)	Offer letter, dated March 28, 2011, to R. Martin Emanuele
21.1	List of Subsidiaries
23.1	Consent of J.H. Cohn LLP, Independent Registered Public Accounting Firm
23.2	Consent of DLA Piper LLP (US) (included in Exhibit 5.1)

† Indicates that confidential treatment has been requested or granted to certain portions, which portions have been omitted and filed separately with the SEC # Indicates management contract or compensatory plan

- (1) Filed with the registrant's Amendment No. 1 to Current Report on Form 8-K/A on May 1, 2006 (SEC file number 001-32157-06796248)
- (2) Filed with the registrant's Current Report on Form 8-K on April 11, 2011 (SEC file number 001-32157-11752769)
- (3) Filed with the registrant's Annual Report on Form 10-K on March 16, 2006 (SEC file number 001-32157-06693266)
- (4) Filed with the registrant's Current Report on Form 8-K on October 13, 2009 (SEC file number 001-32157-091115090)
- (5) Filed with the registrant's Current Report on Form 8-K on April 26, 2010 (SEC file number 001-32157-10769058)
- (6) Filed with the registrant's Current Report on Form 8-K on June 8, 2009 (SEC file number 001-32157-09878961)
- (7) Filed with the registrant's Current Report on Form 8-K on June 30, 2009 (SEC file number 001-32157-09917820)

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- (8) Filed with the registrant's Current Report on Form 8-K on August 5, 2009 (SEC file number 001-32157-09989205)
- (9) Filed with the registrant's Amendment No. 3 to the Registration Statement on Form S-1 on October 5, 2009 (SEC file number 333-160778-091107945)
- (10) Filed with the registrant's Current Report on Form 8-K on January 4, 2010 (SEC file number 001-32157- 10500379)
- (11) Filed with the registrant's Current Report on Form 8-K on May 3, 2010 (SEC file number 001-32157-10790486)
- (12) Filed with the registrant's Current Report on Form 8-K on December 15, 2008 (SEC file number 001-32157-081249921)
- (13) Filed with the registrant's Quarterly Report on Form 10-Q on August 12, 2005 (SEC file number 001-32157-051022046)
- (14) Filed with the registrant's Current Report on Form 8-K on September 22, 2006 (SEC file number 001-32157-061103268)
- (15) Filed with the registrant's Current Report on Form 8-K on February 25, 2008 (SEC file number 001-32157 08638638)
- (16) Filed with the registrant's Current Report on Form 8-K on September 1, 2009 (SEC file number 001-32157-091049161)
- (17) Filed with the registrant's Amendment No. 2 to the Registration Statement on Form S-1 on September 25, 2009 (SEC file number 333-160778-091087750)
- (18) Filed with the registrant's Current Report on Form 8-K on January 7, 2011 (SEC file number 001-32157-11515655)
- (19) Filed with the registrant's Annual Report on Form 10-K on March 15, 2007 (SEC file number 001-32157-07697283)
- (20) Filed with the registrant's Registration Statement on Form S-8 on July 13, 2005 (SEC file number 333-126551-05951362)
- (21) Filed with registrant's Annual Report on Form 10-K on March 17, 2008 (SEC file number 001-32157-08690952)
- (22) Filed with the registrant's Quarterly Report on Form 10-Q on May 12, 2008 (SEC file number 001-32157-08820541)
- (23) Filed with the registrant's Current Report on Form 8-K on June 2, 2008 (SEC file number 001-32157-08874724)
- (24) Filed with the registrant's Current Report on Form 8-K on February 2, 2009 (SEC file number 001-32157- 09561715)
- (25) Filed with the registrant's Quarterly Report on Form 10-Q on August 11, 2008 (SEC file number 001-32157-081005744)
- (26) Filed with the registrant's Current Report on Form 8-K on July 22, 2009 (SEC file number 001-32157-09957353)
- (27) Filed with the registrant's Current Report on Form 8-K on January 26, 2010 (SEC file number 001-32157- 10547818)
- (28) Filed with the registrant's Quarterly Report on Form 10-Q on May 15, 2009 (SEC file number 001-32157-09878961)
- (29) Filed with the registrant's Quarterly Report on Form 10-QSB on August 10, 2004 (SEC file number 001-32157-04963741)
- (30) Filed with the registrant's Current Report on Form 8-K on August 20, 2009 (SEC file number 001-32157-091025631)
- (31) Filed with the registrant's Current Report on Form 8-K on December 24, 2009 (SEC file number 001-32157-091260100)
- (32) Filed with the registrant's Annual Report on Form 10-K on March 18, 2010 (SEC file number 001-32157-10692317)
- (33) Filed with the registrant's Annual Report on Form 10-KSB on March 31, 2005 (SEC file number 001-32157-05719975)
- (34) Filed with the registrant's Current Report on Form 8-K on June 23, 2006 (SEC file number 001-32157-06922676)
- (35) Filed with the registrant's Current Report on Form 8-K on October 23, 2006 (SEC file number 001-32157-061156993)
- (36) Filed with the registrant's Current Report on Form 8-K on March 22, 2011 (SEC file number 001-32157-11704394)
- (37) Filed with the registrant's Quarterly Report on Form 10-Q on May 9, 2011 (SEC file number 001-32157-11823538)

SUBSIDIARIES

Subsidiary	Jurisdiction of Incorporation
SD Pharmaceuticals, Inc. SynthRx, Inc.	Delaware Delaware

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in this Post-Effective Amendment No. 4 to the Registration Statements on Form S-1 (No. 333-160778 and No. 333-162361) and related Prospectus of our report dated March 10, 2011 on our audits of the consolidated financial statements of ADVENTRX Pharmaceuticals, Inc. and Subsidiaries (a development stage enterprise) as of December 31, 2010 and 2009 and for the years then ended and for the period from January 1, 2002 through December 31, 2010, which report appears in the Annual Report on Form 10-K of ADVENTRX Pharmaceuticals, Inc. and Subsidiaries for the year ended December 31, 2010. We also consent to the reference to our firm under the caption "Experts."

/s/ J.H. COHN LLP
San Diego, California
May 10, 2011