

ADVENTRX PHARMACEUTICALS, INC.

- 11,283 shares of 4.25660% Series D Convertible Preferred Stock
- Warrants to Purchase up to 19,800,000 shares of Common Stock
- 79,800,000 shares of Common Stock Underlying the Convertible Preferred Stock and the Warrants

This prospectus supplement should be read in conjunction with the prospectus dated October 6, 2009, Prospectus Supplement No. 1 filed on November 10, 2009 and prospectus supplement No. 2 filed on January 4, 2010 (collectively, the "Prospectus"), which is to be delivered with this prospectus supplement. This prospectus supplement updates the information in the Prospectus. If there is any inconsistency between the information in the Prospectus and this prospectus supplement, you should rely on the information in this prospectus supplement.

Pursuant to the Prospectus, we 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 19,800,000 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 the Prospectus, 79,800,000 shares of our common stock issuable upon conversion of the convertible preferred stock and exercise of the warrants were registered to permit their resale to the public by the purchasers of our convertible preferred stock and warrants. We are not selling the shares of common stock issuable upon conversion of the convertible preferred stock or exercise of the warrants, and therefore will not receive any proceeds from such sales, other than the exercise price, if any, to be received upon exercise of the warrants.

This prospectus supplement includes the following documents, as filed by us with the Securities and Exchange Commission:

- Our Current Report on Form 8-K filed on January 4, 2010.

The exhibits to the Current Report on Form 8-K are not included with this prospectus supplement and are not incorporated herein by reference.

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 6 of the Prospectus, as updated by this prospectus supplement.

You should rely only on the information contained in the Prospectus, any free writing prospectus prepared by us or on our behalf and this prospectus supplement. 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 December 31, 2009 was \$0.3499 per share. We do not intend to list the convertible preferred stock or warrants on any securities exchange.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or passed upon the adequacy or accuracy of the Prospectus or this prospectus supplement. Any representation to the contrary is a criminal offense.

The date of this prospectus supplement is January 4, 2010.

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

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of the
Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): January 3, 2010

ADVENTRX Pharmaceuticals, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation)

001-32157
(Commission File Number)

84-1318182
(IRS Employer Identification No.)

6725 Mesa Ridge Road, Suite 100
San Diego, CA 92121
(Address of principal executive offices and zip code)

Not applicable
(Former name or former address if changed since last report)

Registrant's telephone number, including area code: **(858) 552-0866**

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

- Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)
 - Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)
 - Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))
 - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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Item 1.01 Entry into a Material Definitive Agreement.

On January 3, 2010, ADVENTRX Pharmaceuticals, Inc. (the "Company") entered into an engagement letter agreement with Rodman & Renshaw, LLC (the "Placement Agent") pursuant to which the Placement Agent agreed to serve as exclusive placement agent for the Company on a reasonable best efforts basis in connection with a proposed offering by the Company of its securities.

On January 4, 2010, the Company entered into a securities purchase agreement with certain investors, pursuant to which the Company agreed to sell an aggregate of 19,000 shares of its 3.73344597664961% Series E Convertible Preferred Stock ("convertible preferred stock") and warrants to purchase up to an aggregate of 12,462,285 shares of its common stock ("warrants"). The convertible preferred stock and the warrants were offered in units, with each unit consisting of one share of convertible preferred stock and a warrant to purchase up to approximately 655.91 shares of common stock. Each unit will be sold at a negotiated price of \$1,000. An aggregate of 62,311,426 shares of the Company's common stock are issuable upon conversion of the convertible preferred stock and exercise of the warrants.

Subject to certain ownership limitations, the convertible preferred stock will be convertible at the option of the holder at any time into shares of the Company's common stock at an effective conversion price of \$0.38115 per share, and will accrue a 3.73344597664961% dividend until January 7, 2015. In the event the convertible preferred stock is converted at any time prior to January 7, 2015, the Company will pay the holder of the converted convertible preferred stock an amount equal to the total dividend that would accrue on such convertible preferred stock, \$186.67 per \$1,000 stated value of convertible preferred stock converted, less dividends paid with respect to such converted convertible preferred stock before the relevant conversion date. The conversion price of the convertible preferred stock will be subject to adjustment in the case of stock splits, stock dividends, combinations of shares and similar recapitalization transactions. The convertible preferred stock will be subject to automatic conversion into shares of common stock upon the occurrence of a change in control of the Company and the Company may become obligated to redeem the convertible preferred stock upon the occurrence of certain triggering events, including the material breach of certain contractual obligations to the holders of the convertible preferred stock, the occurrence of a change in control of the Company, the occurrence of certain insolvency events relating to the Company or the failure of the Company's common stock to continue to be listed or quoted for trading on one or more specified United States securities exchanges.

Subject to certain ownership limitations, the warrants will be exercisable at any time after their date of issuance and on or before the 30-month anniversary of their initial exercise date at an exercise price of \$0.3499 per share of common stock, which was the closing price of the Company's common stock on December 31, 2009. The exercise price of the warrants and, in some cases, the number of shares issuable upon exercise, are subject to adjustment in the case of stock splits, stock dividends, combinations of shares and similar recapitalization transactions.

The securities purchase agreement and the certificate of designation authorizing the convertible preferred stock include certain agreements and covenants for the benefit of the holders of the convertible preferred stock, including restrictions on the Company's ability to amend its certificate of incorporation and bylaws, pay cash dividends or distributions with respect to its common stock or other junior securities, repurchase shares of its common stock or other junior securities, issue additional equity securities for a period of 90 days after January 7, 2010 and incur indebtedness, and a requirement to use its reasonable best efforts to maintain the listing of its common stock on one or more specified United States securities exchanges.

The convertible preferred stock, the warrants and the shares of common stock underlying the convertible preferred stock and the warrants are being offered and will be issued and sold pursuant to the Company's effective shelf registration statement(s) on Form S-3 and the related prospectus supplement, dated January 3, 2010 and filed with the Securities and Exchange Commission on January 4, 2010 pursuant to Rule 424(b) under the Securities Act of 1933, as amended. The net proceeds to the Company from the offering, after deducting the placement agent's fees and the Company's estimated offering expenses, but before deducting the Company's dividend and related payment obligations, and excluding the proceeds, if any, from the exercise of the warrants issued in the offering, are expected to be approximately \$17.6 million. The transaction is expected to close on January 7, 2010, subject to satisfaction of customary closing conditions. At the closing, 18.67%, or \$3,546,774, of the gross proceeds will be placed in an escrow account, which amount will be released to make dividend payments and any make-whole payments payable to the holders of the convertible preferred stock.

A copy of the opinion of counsel to the Company relating to the legality of the issuance and sale of the shares of convertible preferred stock and warrants comprising the units and shares of common stock issuable upon conversion of the convertible preferred stock and exercise of the warrants is attached as Exhibit 5.1 hereto.

Pursuant to the terms of an engagement letter agreement with the Placement Agent, assuming the sale of all of the units in the offering, the Company will pay the Placement Agent a fee equal to approximately \$1,330,000 (7.0% of the gross proceeds from the sale of the securities). In addition, the Company will issue to the Placement Agent warrants to purchase up to that number of shares of common stock equal to 5.0% of the number of shares of common stock underlying the convertible preferred stock sold in the offering. Assuming the sale of all of the units in the offering, the compensation warrants to the placement agent will be exercisable for up to 2,492,457 shares of the Company's common stock at an exercise price of \$0.4765 per share. The other terms of the Placement Agent's warrants will be substantially the same as the terms of the warrants issued to the investors in the offering, except that they will include certain restrictions on transfer in accordance with FINRA regulations.

The foregoing description of the terms of the certificate of designation of preferences, rights and limitations of the convertible preferred stock, the securities purchase agreement, the warrants and the engagement letter agreement are subject to, and qualified in their entirety by, such documents attached hereto as Exhibits 3.1, 4.1, 4.2 and 10.1, respectively, and incorporated herein by reference. A copy of the press release announcing the registered direct public offering is attached hereto as Exhibit 99.1 and is incorporated herein by reference.

Item 5.03 Amendments to Articles of Incorporation or Bylaws; Change in Fiscal Year.

On January 4, 2010, the Company filed a Certificate of Designation of Preferences, Rights and Limitations of 3.73344597664961% Series E Convertible Preferred Stock with the Secretary of State of the State of Delaware. The description of the certificate of designation and the convertible preferred stock contained in Item 1.01 above are incorporated herein by reference and are subject to, and qualified in their entirety by, the certificate of designation attached hereto as Exhibit 3.1 and incorporated herein by reference.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits.

The list of exhibits called for by this Item is incorporated by reference to the Exhibit Index filed with this report.

SIGNATURE

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

ADVENTRX Pharmaceuticals, Inc.

Dated: January 4, 2010

By: /s/ Patrick L. Keran

Name: Patrick L. Keran

Title: General Counsel and Vice President, Legal

Exhibit Index

<u>Exhibit No.</u>	<u>Description</u>
3.1	Certificate of Designation of Preferences, Rights and Limitations of 3.73344597664961% Series E Convertible Preferred Stock
4.1	Form of Securities Purchase Agreement, dated January 4, 2010, by and between ADVENTRX Pharmaceuticals, Inc. and the purchaser(s) listed on the signature pages thereto
4.2	Form of Common Stock Purchase Warrant
5.1	Opinion of DLA Piper LLP (US)
10.1	Engagement Letter Agreement, dated January 3, 2010, by and between ADVENTRX Pharmaceuticals, Inc. and Rodman & Renshaw, LLC
23.1	Consent of DLA Piper LLP (US) (included in Exhibit 5.1)
99.1	Press Release, dated January 4, 2010