

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, prospectus supplement No. 2 filed on January 4, 2010 and prospectus supplement No. 3 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 Reports on Form 8-K filed on January 26, 2010, February 3, 2010; February 4, 2010 and February 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 February 9, 2010 was \$0.31 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 February 11, 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 20, 2010

ADVENTRX Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Charter)

Delaware
(State or Other Jurisdiction of
Incorporation)

001-32157
(Commission File No.)

84-1318182
(IRS Employer Identification No.)

**6725 Mesa Ridge Road, Suite 100
San Diego, CA 92121**
(Address of Principal Executive Offices and Zip Code)

N/A
(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)
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 - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

On January 20, 2010, the Compensation Committee (the “Committee”) of the Board of Directors (the “Board”) of ADVENTRX Pharmaceuticals, Inc. (the “Company”) approved base salaries for 2010, which will be the same as for 2009, for the Company’s remaining employees, who are also named executive officers (as identified in the Company’s proxy statement relating to the Company’s 2009 annual meeting of stockholders) (the “NEOs”). On that date, the Committee also (i) granted stock option awards under the Company’s 2008 Omnibus Incentive Plan (the “Plan”) for the NEOs (the “2010 Options”), which options were granted contingent upon receipt of a waiver as described below, (ii) adopted an incentive plan for 2010 (including target awards for the NEOs and corporate performance goals) and (iii) modified outstanding options previously granted to the NEOs on July 21, 2009 (the “2009 Options”) to provide for the acceleration of vesting and exercisability of the 2009 Options in the event of an “involuntary termination” (as defined below).

The following table sets forth the existing base salary for each of the NEOs, which have been in effect since January 1, 2009, the base salary for each of the NEOs for 2010 and the number of shares underlying the 2010 Options granted to the NEOs:

<u>Name</u>	<u>Primary Title</u>	<u>2009 Base Salary</u>	<u>2010 Base Salary</u>	<u>No. of Shares Underlying Option Award</u>
Brian M. Culley	Principal Executive Officer	\$315,000	\$315,000	1,600,000
Patrick L. Keran	Principal Financial/Accounting Officer and General Counsel	\$289,000	\$289,000	1,600,000

The Company is a party to that certain Rights Agreement, dated July 27, 2005, as amended (the “Rights Agreement”). Under the terms of the Rights Agreement, the Company is prohibited from, among other things, granting certain of its securities without complying with the provisions of the Rights Agreement. The Committee granted the 2010 Options to the NEOs subject to and contingent upon receipt of a certain waiver under the Rights Agreement, and if such waiver is not obtained, the grant of the 2010 Options will not be effective. The 2010 Options will be granted as of the date the waiver is executed and delivered to the Company (the “Grant Date”). As of the time of filing this Current Report, the Company has not received the waiver. If the waiver is executed and delivered, each of the 2010 Options granted to the NEOs will have an exercise price per share equal to the closing price of the Company’s common stock on the Grant Date (or, if no such closing price is reported on the Grant Date, the last date preceding the Grant Date on which such a closing price is reported), and will vest and become exercisable as to 25% of the shares underlying each stock option on each of January 1, 2011, January 1, 2012, January 1, 2013 and January 1, 2014, with each vesting event subject to the respective NEO’s continuous service (as defined in the Plan). However, in the event the NEO ceases to provide services to the Company as an employee by reason of an “involuntary termination” (as defined below), the option shall, immediately prior to such involuntary termination, vest and become exercisable with respect to 25% of the total number of shares subject to the option, or 400,000 shares, and the exercisability of the then-vested portion of the option (after taking into account the foregoing acceleration) shall be extended such that the option shall be exercisable for a period of 12 months from the date of such involuntary termination. In addition, the vesting and/or exercisability of each option will accelerate or be extended under certain circumstances, including, (i) in the event of a change in control (as defined in the Plan), acceleration of vesting with respect to 50% of the then unvested shares on the day prior to the date of the change in control and, subject to the respective NEO’s continuous service, with respect to the remaining 50% of the then

unvested shares on the one year anniversary of the date of the change in control, (ii) subject to the preceding clause (i), in the event of a change of control, to the extent the successor company (or a subsidiary or parent thereof) does not assume or substitute for the option, acceleration in full of vesting on the day prior to the date of the change in control if the NEO is then providing services or was the subject of an involuntary termination in connection with, related to or in contemplation of the change in control and exercisability for a period of 24 months from the date of such involuntary termination, and (iii) subject to the preceding clause (i), in the event of a change of control, to the extent the successor company (or a subsidiary or parent thereof) assumes or substitutes for the option, and in the event of an involuntary termination of the NEO within 12 months following the date of the change in control, acceleration in full of vesting and exercisability for a period of 24 months from the date of such involuntary termination.

Pursuant to the incentive plan for 2010 adopted by the Committee (the "2010 Incentive Plan"), the NEOs are eligible for incentive awards based upon the achievement of corporate performance objectives in effect at the end of 2010. Awards under the 2010 Incentive Plan generally will be paid in cash; however, the Committee has discretion to determine the composition of each award. The potential award of each of the NEOs will be based 100% on the Company's achievement of corporate objectives and the target award amount for each NEO is \$150,000. The target amount of each award may be increased or decreased by multiplying the NEO's target amount by a corporate performance multiplier, as will be determined by the Committee in the first quarter of 2011. Award multipliers will range from zero to 1.5. Payment of any awards under the 2010 Incentive Plan will be made after December 31, 2010 and on or before March 14, 2011. If an NEO's employment with the Company terminates prior to payment of an award, it will be at the sole discretion of the Committee whether or not any award payment is made to that NEO.

The corporate performance goals under the 2010 Incentive Plan were set by the Committee based on recommendations from the NEOs and reflect the Committee's assessment, as of January 20, 2010, of near-term corporate objectives that will enhance stockholder value. The corporate objectives involve the Company's receipt of favorable response(s) from the U.S. Food and Drug Administration regarding one or more of the Company's product candidates, favorable progress in the development and/or commercialization of one or more of the Company's products and the maintenance of specified levels of capital at December 31, 2010.

Under the 2010 Incentive Plan, if a corporate objective becomes irrelevant or undesirable or if a strategic change or other event affects the objective, the Committee, after considering the recommendations of the NEOs, may adjust the weighting of all objectives, substitute a new objective, eliminate the affected objective, take no action or effect any combination of the foregoing. In addition, subject to contractual obligations, the Committee has absolute discretion to abolish the 2010 Incentive Plan at any time or to alter any terms and conditions under which incentive awards will be paid, with or without cause and with or without prior notice.

The 2009 Options were modified to provide that, in the event of the "involuntary termination" (as defined below) of an NEO, the applicable 2009 Option would, immediately prior to such involuntary termination, vest and become exercisable with respect to 25% of the total number of shares subject to the applicable 2009 Option, or 425,000 shares.

For purposes of the 2010 Options and the 2009 Options, "involuntary termination" means (i) without the NEO's express written consent, a Board action or external events causing or immediately portending a material reduction or alteration of the NEO's duties, position or responsibilities relative to the NEO's duties, position or responsibilities in effect immediately prior to such reduction or alteration, or the removal of the NEO from such position, duties or responsibilities; provided, however, that an

“Involuntary Termination” shall not be deemed to occur (A) with respect to Brian M. Culley, if Mr. Culley remains the head of and most senior individual within the Company’s (or its successor’s) business development function and (B) with respect to Patrick L. Keran, if Mr. Keran remains the head of and most senior individual within the Company’s (or its successor’s) legal function; (ii) without the NEO’s express written consent, a material reduction by the Company of the NEO’s base salary as in effect immediately prior to such reduction; (iii) without the NEO’s express written consent, the relocation of the NEO’s principal place of employment with the Company by more than 50 miles; or (iv) any termination of the NEO by the Company without “cause” (as defined below). For purposes of the 2010 Options and the 2009 Options, “cause” means (i) any act of personal dishonesty taken by the NEO in connection with his responsibilities as an employee which is intended to result in substantial personal enrichment of the NEO; (ii) the NEO’s conviction of a felony that the Board reasonably believes has had or will have a material detrimental effect on the Company’s reputation or business; (iii) a willful act by the NEO that constitutes misconduct and is materially injurious to the Company, or (iv) continued willful violations by the NEO of his obligations to the Company after there has been delivered to the NEO a written demand for performance from the Company that describes the basis for the Company’s belief that the NEO has not substantially performed his duties.

The descriptions of the provisions of the terms and conditions of the stock option awards, the 2010 Incentive Plan and the modification to outstanding options set forth above do not purport to be complete and are qualified in their entirety by reference to the form of Incentive Stock Option Grant Agreement with Mr. Culley, the form of Incentive Stock Option Grant Agreement with Mr. Keran, the 2010 Incentive Plan and the form of letter agreement, dated January 20, 2010, modifying option, which are filed herewith as Exhibits 10.1, 10.2, 10.3 and 10.4 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 26, 2010

By: /s/ Patrick L. Keran

Name: Patrick L. Keran

Title: General Counsel

Exhibit Index

<u>Exhibit No.</u>	<u>Description</u>
10.1	Form of Incentive Stock Option Grant Agreement for use in connection with January 2010 option grant to Brian M. Culley
10.2	Form of Incentive Stock Option Grant Agreement for use in connection with January 2010 option grant to Patrick L. Keran
10.3	2010 Incentive Plan
10.4	Form of letter, dated January 20, 2010, modifying option

**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): February 2, 2010

ADVENTRX Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Charter)

Delaware
(State or Other Jurisdiction of
Incorporation)

001-32157
(Commission File No.)

84-1318182
(IRS Employer Identification No.)

**6725 Mesa Ridge Road, Suite 100
San Diego, CA 92121**
(Address of Principal Executive Offices and Zip Code)

N/A
(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:

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 - Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))
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Item 5.02. Departure of Directors or Principal Officers; Election of Directors; Appointment of Principal Officers.

On February 2, 2010, the Board of Directors (the "Board") of ADVENTRX Pharmaceuticals, Inc. (the "Company") appointed Odysseas D. Kostas to the Board. Dr. Kostas was also appointed to the Board's Audit Committee. A copy of the press release announcing this appointment is furnished as Exhibit 99.1 hereto.

The Company is a party to a Rights Agreement, effective as of July 27, 2005, as amended (the "Rights Agreement"), with the following purchaser parties: Icahn Partners LP, Icahn Partners Master Fund LP, High River Limited Partnership, Viking Global Equities LP and VGE III Portfolio Ltd. Under the terms of the Rights Agreement, until the earlier of (1) July 27, 2012, (2) the date that the purchaser parties aggregate holdings are less than 50% of the aggregate shares of the Company's common stock purchased by them pursuant to a purchase agreement entered into in connection with the Rights Agreement and (3) a change of control, the Company is required to nominate a Board nominee selected by the purchaser parties holding a majority of the shares of the Company's common stock purchased by the purchaser parties pursuant to the purchase agreement. Dr. Kostas was appointed to the Board in consideration of the foregoing provision.

In connection with Dr. Kostas' appointment to the Board, consistent with the Company's current Director Compensation Policy, on February 2, 2010 (the "Grant Date"), the Board approved the grant to Dr. Kostas of two stock options, one to purchase 100,000 shares of the Company's common stock (the "Appointment Option") and the other to purchase 33,332 shares of the Company's common stock (the "Pro-Rated Annual Option"), both of which were granted under the Company's 2008 Omnibus Incentive Plan (the "Plan"), have an exercise price of \$0.32, which was the closing price of the Company's common stock on the Grant Date and will expire on the tenth anniversary of the Grant Date. The Appointment Option will vest and become exercisable as to 1/36th of the shares subject to the option at the end of each successive month following February 1, 2010, and the Pro-Rated Option will vest and become exercisable as to 1/4th of the shares subject to the option at the end of each successive month following February 1, 2010, in each case provided that Dr. Kostas is then providing services to the Company. Each option will terminate in its entirety, regardless of whether it is vested, three years after the date Dr. Kostas ceases to provide services to the Company for any reason (other than his death or disability). In addition, in the event of a change of control, each option will vest and become exercisable on the day prior to the date of the change in control if Dr. Kostas is then providing services to the Company, and each option will terminate on the date of the change in control to the extent not exercised.

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: February 3, 2010

By: /s/ Patrick Keran

Name: Patrick L. Keran

Title: President and Chief Operating Officer

EXHIBIT INDEX

99.1 Press Release, dated February 3, 2010.

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

**FORM 8-K/A
(Amendment No. 1)**

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

Date of report (Date of earliest event reported): February 2, 2010

ADVENTRX Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Charter)

Delaware
(State or Other Jurisdiction of
Incorporation)

001-32157
(Commission File No.)

84-1318182
(IRS Employer Identification No.)

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Explanatory Note

ADVENTRX Pharmaceuticals, Inc. (the "Company") is filing this Amendment No. 1 to supplement Item 5.02 of the Current Report on Form 8-K originally filed with the Securities and Exchange Commission on January 26, 2010 (the "Original Report") with information called for by Item 5.02(e) of Form 8-K that was unknown as of the time of filing of the Original Report.

Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

In the Original Report, the Company reported that, on January 20, 2010, the Compensation Committee (the "Committee") of the Company's Board of Directors (the "Board") granted stock option awards (the "2010 Options") under the Company's 2008 Omnibus Incentive Plan to Brian M. Culley and Patrick L. Keran, the Company's remaining employees, who are also its named executive officers (as identified in the Company's proxy statement relating to the Company's 2009 annual meeting of stockholders (the "NEOs")), which options were granted contingent upon receipt of a waiver, as described below.

As described in the Original Report, the Company is a party to that certain Rights Agreement, dated July 27, 2005, as amended (the "Rights Agreement"). Under the terms of the Rights Agreement, the Company is prohibited from, among other things, granting certain of its securities without complying with the provisions of the Rights Agreement. The Committee granted the 2010 Options to the NEOs subject to and contingent upon receipt of a certain waiver under the Rights Agreement, and if such waiver was not obtained, the grant of the 2010 Options would not be effective. As of the time of filing of the Original Report, the Company had not received the waiver.

On February 2, 2010, the executed waiver was delivered to the Company. Accordingly, on February 2, 2010, each of the NEOs was granted a 2010 Option pursuant to which such NEO has the right to purchase 1,600,000 shares of the Company's common stock at an exercise price per share of \$0.32, which was the closing price of the Company's common stock on February 2, 2010.

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: February 4, 2010

By: /s/ Patrick L. Keran

Name: Patrick L. Keran

Title: President and Chief Operating Officer

**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): February 1, 2010

ADVENTRX Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Charter)

Delaware
(State or Other Jurisdiction of
Incorporation)

001-32157
(Commission File No.)

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Item 5.02. Departure of Directors or Certain Officers; Election of Directors; Appointment of Certain Officers; Compensatory Arrangements of Certain Officers.

On February 1, 2010, the Board of Directors of ADVENTRX Pharmaceuticals, Inc. (the “Company”) appointed Brian M. Culley, previously the Company’s chief business officer and a senior vice president, to serve as the Company’s chief executive officer and appointed Patrick L. Keran, previously the Company’s general counsel and vice president, legal, to serve as the Company’s president and chief operating officer. Mr. Keran will continue to serve as the Company’s secretary and principal financial and accounting officer. A copy of the press release announcing these title changes is furnished as Exhibit 99.1 hereto.

Mr. Culley, age 38, has served as the Company’s principal executive officer since February 2009 and chief business officer and a senior vice president since January 2007. Mr. Culley served as vice president, business development upon joining the Company in December 2004, and was appointed senior vice president, business development in February 2006. From 2002 until 2004, Mr. Culley managed all strategic collaborations and licensing agreements for iTherx, Inc. (formerly, Immusol, Inc.) in San Diego, where his most recent title was director of business development and marketing. From 1999 until 2000, he was a licensing and marketing associate at the University of California, San Diego, department of technology transfer & intellectual property services and from 1996 to 1999, he was a research associate for Neurocrine Biosciences, Inc., where he performed drug discovery research. Mr. Culley has over 17 years of experience in the biotechnology industry, including deal structure and negotiation, licensing, due diligence, market and competitive research, and venture funding. He received a B.S. in biology from Boston College, an M.S. in biochemistry from the University of California, Santa Barbara and an M.B.A. from The Johnson School of Business at Cornell University with an emphasis on private equity and entrepreneurship.

Mr. Keran, age 38, has served as the Company’s principal financial and accounting officer since July 2009, vice president, legal since January 2007, secretary since September 2006 and general counsel since August 2006. From April 2004 to August 2006, Mr. Keran was associate general counsel at Isis Pharmaceuticals, a publicly held drug discovery and development company. From February 2003 to April 2004, Mr. Keran practiced corporate law at the law firm of Heller Ehrman LLP, specializing in public and private financings, licensing arrangements, mergers and acquisitions and corporate governance matters. From September 1999 to February 2003, Mr. Keran practiced law at the law firm of Brobeck Phleger & Harrison LLP where he had a similar corporate practice. Mr. Keran is licensed to practice law in the State of California. Mr. Keran received a B.A. from the University of California at San Diego and a J.D. from the University of California at Berkeley, Boalt Hall School of Law.

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: February 4, 2010

By: /s/ Patrick L. Keran

Name: Patrick L. Keran

Title: President and Chief Operating Officer

Exhibit Index

<u>Exhibit No.</u>	<u>Description</u>
99.1	Press Release, dated February 4, 2010