

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): **September 22, 2006**

ADVENTRX Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Charter)

Delaware
(State or Other Jurisdiction
of Incorporation)

1-15803
(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)
 - 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.

In connection with the appointment of Jack Lief to the board of directors (the “Board”) of Adventrx Pharmaceuticals, Inc. (the “Company”), the Company entered into that certain First Amendment to Rights Agreement, dated September 22, 2006 (the “Amendment”), with the Icahn Purchasers (as defined in the Amendment). The Amendment modified that certain Rights Agreement, with an effective date of July 27, 2005 (the “Agreement”), among the Company and the Purchasers (as defined in the Agreement) pursuant to which the Company agreed to set the authorized number of directors constituting the Board at 6 and to not change such number. As set forth in the Amendment, the Board may set the authorized number of directors constituting the Board at 7 if the vacancy created by such action is filled by Jack Lief; provided, however, that, if at any time there are then seven members of the Board and one of such members is removed or resigns, retires or dies and the Purchaser Designee, if any, does not approve a successor, the Company agrees to do those things reasonably necessary and within its control to, as soon as reasonably practicable after the effective date of such removal, resignation, retirement or death, set the authorized number of Board directors at six. A complete copy of the Amendment is filed herewith as Exhibit 10.1 and incorporated herein by reference.

The Icahn Purchasers hold approximately 11% of the Company’s outstanding common stock and Keith Meister, a member of the Board, is affiliated with the Icahn Purchasers and is the Purchaser Designee.

For additional details regarding the appointment of Mr. Lief to the Board, please see the disclosures under Item 5.02 below.

Item 5.02. Departure of Directors or Principal Officers; Election of Directors; Appointment of Principal Officers.

On September 22, 2006, the Company issued a press release announcing the appointment of Mr. Lief to the Board, which appointment was effective as of September 22, 2006. A copy of this press release is furnished as Exhibit 99.1 hereto. It is anticipated that Mr. Lief will be appointed to one or more committees of the Board, though no formal decision has yet been made.

Mr. Lief is a co-founder and since April 1997 has served as President, Chief Executive Officer and a member of the board of directors of Arena Pharmaceuticals, Inc., a clinical-stage biopharmaceutical company focused on the discovery, development and commercialization of small molecule drugs targeting G protein-coupled receptors. From 1995 to April 1997, Mr. Lief served as an advisor and consultant to numerous biopharmaceutical organizations. From 1989 to 1994, Mr. Lief served as Senior Vice President, Corporate Development and Secretary of Cephalon, Inc., a biopharmaceutical company. From 1983 to 1989, Mr. Lief served as Director of Business Development and Strategic Planning for Alpha Therapeutic Corporation, a manufacturer of biological products. Mr. Lief joined Abbott Laboratories, a pharmaceutical company, in 1972, where he served until 1983, most recently as the head of International Marketing Research. Mr. Lief is a director of Accumetrics, Inc., a developer and marketer of diagnostic tests, ReqMed Company, Ltd., a provider of partnering opportunities, R&D strategies and bio-venture funding, and TaiGen Biotechnology Co., Ltd., a biotechnology company. Mr. Lief is also an Executive Board Member of BIOCOM, a life science industry association

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representing more than 450 member companies in San Diego and Southern California, and he was the Chairman of BIOCOM from March 2005 to March 2006. Mr. Lief holds a B.A. from Rutgers University and an M.S. in Psychology (Experimental and Neurobiology) from Lehigh University.

Item 9.01. Financial Statements and Exhibits.

(d) Exhibits.

The list of exhibits called for by this Item is incorporated by reference to the Index to Exhibits 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: September 22, 2006

By: /s/ Evan M. Levine

Name: Evan M. Levine

Title: Chief Executive Officer

INDEX TO EXHIBITS

10.1 First Amendment to Rights Agreement, dated September 22, 2006.

99.1 Press Release, dated September 22, 2006.

FIRST AMENDMENT TO RIGHTS AGREEMENT

This First Amendment to Rights Agreement (this "Amendment") is entered into effective as of September 22, 2006 (the "Effective Date") by and between Adventrx Pharmaceuticals, Inc., a Delaware corporation (the "Company"), and Icahn Partners LP, Icahn Partners Master Fund LP and High River Limited Partnership (collectively, the "Icahn Purchasers").

WHEREAS, the Company, the Icahn Purchasers and Viking Global Equities LP and VGE III Portfolio Ltd. (collectively, the "Viking Purchasers" and, together with the Icahn Purchasers, the "Purchasers") are parties to that certain Rights Agreement, with an effective date of July 27, 2005 (the "Rights Agreement"), pursuant to which the Company agreed to set the authorized number of directors constituting the Company's board of directors at 6 and to not change such number;

WHEREAS, pursuant to Section 6.2 of the Rights Agreement, any term of the Rights Agreement may be amended with the written consent of the Company and the Icahn Purchasers;

NOW, THEREFORE, in consideration of both the foregoing premises and the terms and conditions set forth below, the Company and the Icahn Purchasers hereby agree as follows:

1. Board of Directors. The first sentence of Section 4 of the Rights Agreement is hereby amended and restated to read in its entirety as follows:

"Effective promptly after the Closing, the Company shall set the authorized number of Board directors at six and the Company shall appoint a person suggested by the Purchasers which at the time own a majority of the Purchased Shares (the "Purchaser Designee") to the vacancy so created; provided, however, that such person, if anyone other than Mr. Carl Icahn, would not subject the Company to making any disclosures under Item 401(f) of SEC Regulation S-K in any proxy statement (the "Criteria"); provided, further, that, the Board may set the authorized number of Board directors at seven if the vacancy created by such action is filled by Jack Lief; provided, further, that, if at any time there are then seven members of the Board and one of such members is removed or resigns, retires or dies and the Purchaser Designee, if any, does not approve a successor, the Company agrees to do those things reasonably necessary and within its control to, as soon as reasonably practicable after the effective date of such removal, resignation, retirement or death, set the authorized number of Board directors at six."

2. Internal Reference. The Company and the Purchasers agree that any reference in the Rights Agreement to "this Agreement" (or other similar reference) will be a reference to the Rights Agreement, as amended.

3. Conflicts. Except to the extent amended herein, the Rights Agreement remains in full force and effect.

4. Governing Law. This Amendment will be governed by and construed in accordance with the laws of the State of New York applicable to agreements made and to be fully performed therein.

[Signature page follows]

IN WITNESS WHEREOF, the Company and the Icahn Purchasers have executed this First Amendment to Rights Agreement in duplicate originals effective as of the Effective Date.

COMPANY:

ADVENTRX PHARMACEUTICALS, INC.

By: /s/ Evan M. Levine

Name: Evan M. Levine

Title: Chief Executive Officer

ICAHN PURCHASERS:

ICAHN PARTNERS LP

By: /s/ Keith Meister

Name: Keith Meister

Title: Authorized Signatory

ICAHN PARTNERS MASTER FUND LP

By: /s/ Keith Meister

Name: Keith Meister

Title: Authorized Signatory

HIGH RIVER LIMITED PARTNERSHIP

By: /s/ Edward Mattner

Name: Edward Mattner

Title: Authorized Signatory

[COUNTERPART SIGNATURE PAGE TO FIRST AMENDMENT TO RIGHTS AGREEMENT]

ADVENTRX APPOINTS JACK LIEF AS DIRECTOR

SAN DIEGO — September 22, 2006 — ADVENTRX Pharmaceuticals, Inc. (Amex: ANX) today announced that Jack Lief, president and chief executive officer, and a founder and director, of Arena Pharmaceuticals, Inc. (Nasdaq: ARNA), will join its board of directors. In connection with Mr. Lief's appointment, ADVENTRX increased the size of its board from six to seven.

"Jack brings a wealth of experience and leadership within the biotechnology and pharmaceutical industries and we are delighted to welcome him to our board," said Evan M. Levine, ADVENTRX chief executive officer. "We believe his unique perspective will be an important asset as we execute our clinical development and commercial strategies."

"I'm very pleased to be appointed to the board of ADVENTRX," commented Jack Lief, president and CEO of Arena. "I hope that as a member of the board I can leverage my knowledge and experience to help advance the development and commercialization of the company's drug candidates, such as CoFactor®, which hold significant potential to provide patients with better treatment options."

Mr. Lief is president and chief executive officer, and a founder and director, of Arena Pharmaceuticals, a clinical-stage biopharmaceutical company, since April 1997. For two years prior to founding Arena Pharmaceuticals, Mr. Lief served as a consultant to numerous biopharmaceutical organizations. From 1989 to 1994, Mr. Lief served as senior vice president, corporate development and secretary for Cephalon, Inc., a biopharmaceutical company. From 1983 to 1989, Mr. Lief served as director of business development and strategic planning for Alpha Therapeutic Corporation, a manufacturer of biological products. From 1972 until 1983, Mr. Lief worked at Abbott Laboratories, where his most recent title was head of international marketing research. Mr. Lief currently serves on several boards of directors, including Accumetrics, Inc., a developer and marketer of diagnostic tests, ReqMed Company, Ltd., a provider of partnering opportunities, R&D strategies and bio-venture funding, and TaiGen Biotechnology Co., Ltd., a biotechnology company. In addition, Mr. Lief is an executive board member for BIOCOM, a life science industry association representing more than 450 member companies in San Diego and Southern California. From March 2005 to March 2006, he served as chairman of BIOCOM. Mr. Lief earned a B.A. from Rutgers University and an M.S. in Psychology from Lehigh University.

About ADVENTRX

ADVENTRX Pharmaceuticals is a biopharmaceutical research and development company focused on introducing treatments for cancer and infectious disease that surpass the performance and safety of existing drugs, by addressing significant problems such as drug metabolism, toxicity, bioavailability and resistance. More information can be found on ADVENTRX's Web site at www.adventrx.com.

Forward Looking Statement

ADVENTRX cautions you that statements included in this press release that are not a description of historical facts are forward-looking statements that involve risks, uncertainties, assumptions and other factors that, if they do not materialize or prove to be accurate, could cause ADVENTRX's results to differ materially from historical results or those expressed or implied by such forward-looking statements. Such forward-looking statements are made based on management's current expectations and beliefs and should not be regarded as a statement or representation by ADVENTRX that any of its plans will be achieved on time or at all. The potential risks and uncertainties that could cause actual results to differ materially include, but are not limited to: successfully educating new directors and integrating new directors with existing directors and management; the risk that directors' will undertake projects that divert their respective attention from ADVENTRX matters, or that may pose a conflict of interest with ADVENTRX; the risk that ADVENTRX will be unable to raise sufficient capital to fund the projects necessary to meet its anticipated or stated goals and milestones; the potential to attract a strategic partner and the terms of any related transaction; the ability to timely enroll subjects in ADVENTRX's current and anticipated clinical trials; the results of pending clinical trials for CoFactor® or Adventrx' other product candidates; the potential for CoFactor® and ADVENTRX's other product candidates to receive regulatory approval for one or more indications on a timely basis or at all, and the uncertain process of seeking regulatory approval; other difficulties or delays in developing, testing, manufacturing and marketing of and obtaining regulatory approval for CoFactor® or ADVENTRX's other product candidates; the market potential for fluoropyrimidine biomodulators and other target markets, and ADVENTRX's ability to compete in those markets; unexpected adverse side effects or inadequate therapeutic efficacy of CoFactor® or ADVENTRX's other products that could delay or prevent regulatory approval or commercialization, or that could result in recalls or product liability claims; the risk that preclinical results are not indicative of the success of subsequent clinical trials and that products will not perform as preclinical data suggests or as otherwise anticipated; the potential for regulatory authorities to require additional preclinical work or other clinical requirements to support regulatory filings; the scope and validity of patent protection for CoFactor® and ADVENTRX's other product candidates; and other risks and uncertainties more fully described in ADVENTRX's press releases and periodic filings with the Securities and Exchange Commission. ADVENTRX's public filings with the Securities and Exchange Commission are available at <http://www.sec.gov>.

You are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date when made. All forward-looking statements are qualified in their entirety by this cautionary statement and ADVENTRX assumes no obligation to revise or update any forward-looking statement, including as set forth in this press release, to reflect events or circumstances arising after the date on which it was made.

Contact:

ADVENTRX Pharmaceuticals

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