

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

FORM S-8

**REGISTRATION STATEMENT UNDER
THE SECURITIES ACT OF 1933**

Idera Pharmaceuticals, Inc.

(Exact Name of Registrant as Specified in Its Charter)

Delaware
(State or Other Jurisdiction of Incorporation
or Organization)

04-3072298
(I.R.S. Employer
Identification No.)

167 Sidney Street
Cambridge, Massachusetts
(Address of Principal Executive Offices)

02139
(Zip Code)

2008 Stock Incentive Plan
1995 Employee Stock Purchase Plan
(Full Title of the Plan)

Sudhir Agrawal, D. Phil.
Chief Executive Officer
Idera Pharmaceuticals, Inc.
167 Sidney Street
Cambridge, Massachusetts 02139
(Name and Address of Agent For Service)

(617) 679-5500
(Telephone Number, Including Area Code, of Agent For Service)

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 of the Exchange Act.

Large accelerated filer Accelerated filer Non-accelerated filer Smaller reporting company
(Do not check if a smaller reporting company)

CALCULATION OF REGISTRATION FEE

| Title of Securities to be Registered | Amount to be Registered(1) | Proposed Maximum Offering Price Per Share | Proposed Maximum Aggregate Offering Price | Amount of Registration Fee |
|--|----------------------------|---|---|----------------------------|
| Common Stock, \$0.001 par value per share (including the associated Preferred Stock Purchase Rights), to be issued pursuant to the Idera Pharmaceuticals, Inc. 2008 Stock Incentive Plan, as amended | 2,300,000 shares(2) | \$1.95(3) | \$4,485,000(3) | \$521.00 |

| | | | | |
|--|-------------------|-----------|--------------|---------|
| Common Stock, \$0.001 par value per share (including the associated Preferred Stock Purchase Rights), to be issued pursuant to the Idera Pharmaceuticals, Inc. 1995 Employee Stock Purchase Plan, as amended | 250,000 shares(4) | \$1.95(3) | \$487,500(3) | \$57.00 |
|--|-------------------|-----------|--------------|---------|

- (1) In accordance with Rule 416 under the Securities Act of 1933, as amended, this registration statement shall be deemed to cover any additional securities that may from time to time be offered or issued to prevent dilution resulting from stock splits, stock dividends or similar transactions.
- (2) Consists of 2,300,000 additional shares issuable under the 2008 Stock Incentive Plan.
- (3) Estimated solely for the purpose of calculating the registration fee pursuant to Rules 457(c) and 457(h) of the Securities Act of 1933, as amended, and based upon the average of the high and low prices of the Registrant's Common Stock as reported on the Nasdaq Global Market on August 1, 2011.
- (4) Consists of 250,000 additional shares issuable under the 1995 Employee Stock Purchase Plan.

STATEMENT OF INCORPORATION BY REFERENCE

This Registration Statement on Form S-8 is filed to register the offer and sale of (i) an additional 2,300,000 shares of the Registrant's common stock, \$0.001 par value per share, to be issued under the Registrant's 2008 Stock Incentive Plan and (ii) an additional 250,000 shares of the Registrant's common stock, \$0.001 par value per share, to be issued under the Registrant's 1995 Employee Stock Purchase Plan. This Registration Statement incorporates by reference the contents of (i) the registration statement on Form S-8, File No. 333-152669, filed by the Registrant on July 31, 2008, relating to the Registrant's 2008 Stock Incentive Plan and (ii) the registration statements on Form S-8, File Nos. 333-03896, 333-116011, 333-137687 and 333-152670 filed by the Registrant on April 23, 1996, May 28, 2004, September 29, 2006 and July 31, 2008, respectively, relating to the Registrant's 1995 Employee Stock Purchase Plan.

Item 5. Interests of Named Experts and Counsel.

Wilmer Cutler Pickering Hale and Dorr LLP ("WilmerHale") has opined as to the legality of the securities being offered by this registration statement.

Item 8. Exhibits.

The Exhibit Index immediately preceding the exhibits is incorporated herein by reference.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in Cambridge, Massachusetts on this 5th day of August, 2011.

IDERA PHARMACEUTICALS, INC.

By: /s/ Sudhir Agrawal
Sudhir Agrawal, D. Phil.
Chief Executive Officer

POWER OF ATTORNEY AND SIGNATURES

We, the undersigned officers and directors of Idera Pharmaceuticals, Inc., hereby severally constitute and appoint Sudhir Agrawal and Louis J. Arcudi, III, and each of them singly, our true and lawful attorneys with full power to them, and each of them singly, to sign for us and in our names in the capacities indicated below, the registration statement on Form S-8 filed herewith and any and all subsequent amendments to said registration statement, and generally to do all such things in our names and on our behalf in our capacities as officers and directors to enable Idera Pharmaceuticals, Inc. to comply with the provisions of the Securities Act of 1933, as amended, and all requirements of the Securities and Exchange Commission, hereby ratifying and confirming our signatures as they may be signed by our said attorneys, or any of them, to said registration statement and any and all amendments thereto.

Pursuant to the requirements of the Securities Act of 1933, this registration statement has been signed by the following persons in the capacities and on the dates indicated.

| <u>Signature</u> | <u>Title</u> | <u>Date</u> |
|---|---|----------------|
| <u>/s/ Sudhir Agrawal</u> Sudhir Agrawal, D. Phil. | Chairman, President and Chief Executive Officer (Principal Executive Officer) | August 5, 2011 |
| <u>/s/ Louis J. Arcudi, III</u> Louis J. Arcudi, III | Senior Vice President of Operations, Chief Financial Officer, Treasurer and Secretary (Principal Financial Officer) | August 5, 2011 |
| <u>/s/ Youssef El Zein</u> Youssef El Zein | Director | August 5, 2011 |
| <u>/s/ C. Keith Hartley</u> C. Keith Hartley | Director | August 5, 2011 |

| <u>Signature</u> | <u>Title</u> | <u>Date</u> |
|---|--------------|----------------|
| <u>/s/ Robert W. Karr</u> Robert W. Karr, M.D. | Director | August 4, 2011 |
| <u>/s/ Malcolm MacCoss</u> Malcolm MacCoss, Ph.D. | Director | August 4, 2011 |
| <u>/s/ Hans Mueller</u> Hans Mueller, Ph.D. | Director | August 4, 2011 |
| <u>/s/ William S. Reardon</u> William S. Reardon, C.P.A. | Director | August 5, 2011 |
| <u>/s/ Eve E. Slater</u> Eve E. Slater, M.D., F.A.C.C. | Director | August 5, 2011 |
| <u>James B. Wyngaarden, M.D.</u> | Director | |

INDEX TO EXHIBITS

| Number | Description |
|---------|--|
| 4.1(1) | Specimen Certificate for shares of Common Stock, \$0.001 par value, of Idera Pharmaceuticals, Inc. |
| 4.2(2) | Rights Agreement dated December 10, 2001 by and between Idera Pharmaceuticals, Inc. and Mellon Investor Services LLC, as rights agent. |
| 4.3(3) | Amendment No. 1 to Rights Agreement dated as of August 27, 2003 between Idera Pharmaceuticals, Inc. and Mellon Investor Services LLC, as rights agent. |
| 4.4 (4) | Amendment No. 2 to Rights Agreement dated as of March 24, 2006 between Idera Pharmaceuticals, Inc. and Mellon Investor Services LLC, as rights agent. |
| 4.5 (5) | Amendment No. 3 to Rights Agreement dated January 16, 2007 between Idera Pharmaceuticals, Inc. and Mellon Investor Services, LLC, as rights agent. |
| 5.1 | Opinion of Wilmer Cutler Pickering Hale and Dorr LLP, counsel to the Registrant |
| 23.1 | Consent of Wilmer Cutler Pickering Hale and Dorr LLP (included in Exhibit 5.1) |
| 23.2 | Consent of Ernst & Young LLP |
| 24.1 | Power of attorney (included on the signature pages of this registration statement) |

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- (1) Previously filed with the Securities and Exchange Commission as an Exhibit to the Registration Statement on Form S-1, dated December 8, 1995 (File No. 33-99024) and incorporated herein by reference.
 - (2) Previously filed with the Securities and Exchange Commission as an Exhibit to the Registrant's Registration Statement on Form S-2, dated October 10, 2003 (File No. 333-109630) and incorporated herein by reference.
 - (3) Previously filed with the Securities and Exchange Commission as an Exhibit to the Registrant's Current Report on Form 8-K, dated August 29, 2003 (File No. 000-27352) and incorporated herein by reference.
 - (4) Previously filed with the Securities and Exchange Commission as an Exhibit to the Registrant's Current Report on Form 8-K, dated March 29, 2006 (File No. 001-31918) and incorporated herein by reference.

- (5) Previously filed with the Securities and Exchange Commission as an Exhibit to the Registrant's Current Report on Form 8-K, dated January 17, 2007 (File No. 001-31918) and incorporated herein by reference.

WILMERHALE

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wilmerhale.com

August 5, 2011

Idera Pharmaceuticals, Inc.
167 Sidney Street
Cambridge, Massachusetts 02139

Re: 2008 Stock Incentive Plan
1995 Employee Stock Purchase Plan

Ladies and Gentlemen:

We have assisted in the preparation of a Registration Statement on Form S-8 (the "Registration Statement") to be filed with the Securities and Exchange Commission (the "Commission") under the Securities Act of 1933, as amended (the "Securities Act"), relating to an aggregate of 2,550,000 shares of common stock, \$0.001 par value per share (the "Shares"), of Idera Pharmaceuticals, Inc., a Delaware corporation (the "Company"), issuable under the Company's 2008 Stock Incentive Plan and 1995 Employee Stock Purchase Plan (collectively, the "Plans").

We have examined the Certificate of Incorporation and By-Laws of the Company, each as amended and restated to date, and originals, or copies certified to our satisfaction, of all pertinent records of the meetings of the directors and stockholders of the Company, the Registration Statement and such other documents relating to the Company as we have deemed material for the purposes of this opinion.

In our examination of the foregoing documents, we have assumed the genuineness of all signatures, the authenticity of all documents submitted to us as originals, the conformity to original documents of all documents submitted to us as certified, photostatic or other copies, the authenticity of the originals of any such documents and the legal competence of all signatories to such documents.

We assume that the appropriate action will be taken, prior to the offer and sale of the Shares in accordance with the Plans, to register and qualify the Shares for sale under all applicable state securities or "blue sky" laws.

Wilmer Cutler Pickering Hale and Dorr LLP, 60 State Street, Boston, Massachusetts 02109

Beijing Berlin Boston Brussels Frankfurt London Los Angeles New York Oxford Palo Alto Waltham Washington

We express no opinion herein as to the laws of any state or jurisdiction other than the state laws of The Commonwealth of Massachusetts, the General Corporation Law of the State of Delaware and the federal laws of the United States of America.

It is understood that this opinion is to be used only in connection with the offer and sale of the Shares while the Registration Statement is in effect.

Please note that we are opining only as to the matters expressly set forth herein, and no opinion should be inferred as to any other matters.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized for issuance and, when the Shares are issued and paid for in accordance with the terms and conditions of the Plans, the Shares will be validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion with the Commission in connection with the Registration Statement in accordance with the requirements of Item 601(b)(5) of Regulation S-K under the Securities Act. In giving such consent, we do not hereby admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations of the Commission.

Very truly yours,

WILMER CUTLER PICKERING HALE AND DORR
llp

By: /s/ Stuart M. Falber
Stuart M. Falber, Partner

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the 2008 Stock Incentive Plan and the 1995 Employee Stock Purchase Plan of Idera Pharmaceuticals, Inc. of our reports dated March 10, 2011, with respect to the financial statements of Idera Pharmaceuticals, Inc. and the effectiveness of internal control over financial reporting of Idera Pharmaceuticals, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2010, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts

August 5, 2011