

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

**FORM S-3
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933**

ACELRX PHARMACEUTICALS, INC.

(Exact name of registrant as specified in its charter)

Delaware
(State or other jurisdiction of
incorporation or organization)

41-2193603
(I.R.S. Employer
Identification Number)

**351 Galveston Drive
Redwood City, CA 94063
(650) 216-3500**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Richard King
President and Chief Executive Officer
351 Galveston Drive
Redwood City, CA 94063
(650) 216-3500**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

Copies to:

**Mark B. Weeks
Chadwick L. Mills
Cooley LLP
3175 Hanover Street
Palo Alto, CA 94304-1130
(650) 843-5000**

**David W. Pollak
Morgan, Lewis & Bockius LLP
101 Park Avenue
New York, NY 10178
(212) 309-6058**

Approximate date of commencement of proposed sale to the public: As soon as practicable following the effectiveness of this registration statement.

If the only securities being registered on this Form are being offered pursuant to dividend or interest reinvestment plans, please check the following box:

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, as amended, other than securities offered only in connection with dividend or interest reinvestment plans, 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: **333-183237**

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 registration statement pursuant to General Instruction I.D. or a post-effective amendment thereto that shall become effective upon filing with the Commission pursuant to Rule 462(e) under the Securities Act, check the following box.

If this Form is a post-effective amendment to a registration statement filed pursuant to General Instruction I.D. filed to register additional securities or additional classes of securities pursuant to Rule 413(b) under the Securities Act, check the following box.

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. (Check one):

Large accelerated filer

Accelerated filer

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

Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of Each Class of Securities to be Registered ⁽¹⁾	Proposed Maximum Aggregate Offering Price ⁽²⁾	Amount of Registration Fee ⁽³⁾
Common Stock, par value \$0.001 per share	\$8,500,000	\$1,159.40

- ⁽¹⁾ There are being registered hereunder such indeterminate number of shares of the Registrant's common stock, par value \$0.001 per share, as shall have an aggregate initial offering price not to exceed \$8,500,000. The registrant previously registered the offer and sale of certain securities, including its common stock, par value \$0.001 per share, having a proposed maximum aggregate offering price of \$50,000,000 pursuant to a Registration Statement on Form S-3 (File No. 333-183237), which was declared effective by the Securities and Exchange Commission on August 31, 2012 (the "Related Registration Statement"). As of the date hereof, a balance of \$42,500,000 of such securities remains to be offered and sold under the Related Registration Statement. In accordance with Rule 462(b) promulgated under the Securities Act, an additional amount of the registrant's common stock, par value \$0.001 per share, having a proposed maximum aggregate offering price of \$8,500,000 is hereby registered.
- ⁽²⁾ The proposed maximum aggregate offering price per share will be determined by the Registrant in connection with the issuance by the Registrant of the shares of its common stock, par value \$0.001 per share, registered hereunder.
- ⁽³⁾ Calculated pursuant to Rule 457(o) under the Securities Act.

This Registration Statement shall become effective upon filing with the Securities and Exchange Commission in accordance with Rule 462(b) of the Securities Act of 1933, as amended.

**EXPLANATORY NOTE AND INCORPORATION OF
CERTAIN INFORMATION BY REFERENCE**

This Registration Statement is being filed pursuant to Rule 462(b) of the Securities Act of 1933, as amended, and General Instruction IV(A) to Form S-3 to register an additional \$8,500,000 of the Registrant's common stock, par value \$0.001 per share. In accordance with Rule 462(b), this Registration Statement incorporates by reference the contents of the Registrant's Registration Statement on Form S-3 (File No. 333-183237), filed with the Securities and Exchange Commission on August 10, 2012 and declared effective by the Securities and Exchange Commission on August 31, 2012, including all exhibits thereto and all information incorporated by reference therein, other than the exhibits included herein.

The required opinion and consents are listed on an Exhibit Index attached hereto and filed herewith.

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 the requirements for filing on Form S-3 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Redwood City, State of California, on the 17th day of July 2013.

ACELRX PHARMACEUTICALS, INC.

By: /S/ RICHARD A. KING
Richard A. King
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act of 1933, as amended, this Registration Statement has been signed by the following persons in the capacities indicated.

<u>Signature</u>	<u>Title</u>	<u>Date</u>
<u> /S/ RICHARD A. KING</u> Richard A. King	Chief Executive Officer and Director (Principal Executive Officer)	July 17, 2013
<u> /S/ JAMES H. WELCH</u> James H. Welch	Chief Financial Officer (Principal Financial and Accounting Officer)	July 17, 2013
<u> /S/ ADRIAN ADAMS</u> Adrian Adams	Director	July 17, 2013
<u> *</u> Mark G. Edwards	Director	July 17, 2013
<u> *</u> Stephen J. Hoffman	Director	July 17, 2013
<u> *</u> Guy P. Nohra	Director	July 17, 2013
<u> *</u> Pamela P. Palmer	Director	July 17, 2013
<u> *</u> Howard B. Rosen	Director	July 17, 2013
<u> *</u> Mark A. Wan	Director	July 17, 2013

*By: /S/ RICHARD A. KING
Richard A. King
Attorney-in-fact

EXHIBIT INDEX

<u>Exhibit Number</u>	<u>Description of the Document</u>
5.1	Opinion of Cooley LLP.
23.1	Consent of Independent Registered Public Accounting Firm.
23.2	Consent of Cooley LLP (included in Exhibit 5.1).
24.1*	Power of Attorney.

* Previously filed on the signature page of the Registrant's Registration Statement on Form S-3 (File No. 333-183237), filed with the Securities and Exchange Commission on August 10, 2012, and incorporated by reference herein.



July 17, 2013

AcelRx Pharmaceuticals, Inc.
351 Galveston Drive
Redwood City, CA 94063

Ladies and Gentlemen:

We have acted as counsel to AcelRx Pharmaceuticals, Inc., a Delaware corporation (the "**Company**"), in connection with the filing of a Registration Statement on Form S-3 (the "**Registration Statement**") pursuant to Rule 462(b) of Regulation C promulgated under the Securities Act of 1933, as amended (the "**Securities Act**"), relating to an aggregate of \$8,500,000 of shares of common stock, par value \$0.001 per share ("**Common Stock**"), of the Company (the "**Shares**"). The Shares are being registered for offering and sale from time to time pursuant to Rule 415 of the General Rules and Regulations promulgated under the Securities Act (the "**Securities Act Rules**"). The Registration Statement incorporates by reference the Registration Statement on Form S-3 (File No. 333-183237), filed with the Securities and Exchange Commission (the "**SEC**") on August 10, 2012 and declared effective by the SEC on August 31, 2012 (the "**Related Registration Statement**"), including the prospectus which forms a part of the Related Registration Statement (the "**Prospectus**"), as supplemented from time to time by one or more prospectus supplements (each, a "**Prospectus Supplement**").

In connection with this opinion, we have examined and relied upon the originals, or copies certified to our satisfaction, of such records, documents, certificates, opinions, memoranda and other instruments as in our judgment are necessary or appropriate to enable us to render the opinion expressed below. As to certain factual matters, we have relied upon certificates of the officers of the Company and have not sought to independently verify such matters.

In rendering this opinion, we have assumed: (i) the genuineness and authenticity of all signatures on original documents; (ii) the authenticity of all documents submitted to us as originals; (iii) the conformity to originals of all documents submitted to us as copies; (iv) the accuracy, completeness and authenticity of certificates of public officials; and (v) the due authorization, execution and delivery of all documents where authorization, execution and delivery are prerequisites to the effectiveness of such documents. We have also assumed that, at the time of issuance and sale, a sufficient number of shares of Common Stock is authorized and reserved or available for issuance and that the consideration for the issuance and sale of such shares of Common Stock is not less than the par value of the Common Stock, and that, prior to any offering and sale of the Shares, the Company's board of directors (the "**Board**"), including any appropriate committee appointed thereby, will duly authorize the price at which the Shares are to be issued and sold.

Our opinion herein is expressed solely with respect to the federal laws of the United States and the Delaware General Corporation Law. We express no opinion as to whether the laws of any jurisdiction are applicable to the subject matter hereof. We are not rendering any opinion as to compliance with any federal or state antifraud law, rule or regulation relating to securities, or to the sale or issuance thereof.

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On the basis of the foregoing and in reliance thereon, and subject to the qualifications herein stated, we are of the opinion that, with respect to any offering of the Shares, provided that: (i) the Registration Statement has become effective; (ii) an appropriate Prospectus Supplement with respect to the Shares has been prepared, delivered and filed in compliance with the Securities Act and the applicable Securities Act Rules; (iii) if the Shares are to be sold pursuant to a purchase, underwriting or similar agreement, such agreement has been duly authorized, executed and delivered by the Company and the other parties thereto and has become a valid and binding agreement of the Company; (iv) the Board, including any appropriate committee appointed thereby, and appropriate officers of the Company have taken all necessary corporate action to approve the issuance of the Shares and related matters; and (v) the issuance and sale of the Shares do not violate any applicable law or the operative certificate of incorporation or bylaws of the Company or result in a default under or breach of any agreement or instrument binding upon the Company and comply with any requirement or restriction imposed by any court or governmental body having jurisdiction over the Company, then the Shares, when issued and sold in accordance with any duly authorized, executed and delivered purchase, underwriting or similar agreement, will be duly authorized, validly issued, fully paid and nonassessable.

We hereby consent to the filing of this opinion as an exhibit to the Registration Statement and to the reference to our firm under the caption "Legal Matters" in the Prospectus and any Prospectus Supplement included in the Registration Statement and the Related Registration Statement.

Sincerely,

Cooley LLP

By: /s/ Mark B. Weeks

Mark B. Weeks

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Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in this Registration Statement (Form S-3) of AcclRx Pharmaceuticals, Inc. for the registration of common stock of our report dated March 12, 2013, with respect to the financial statements of AcclRx Pharmaceuticals, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2012, filed with the Securities and Exchange Commission, and to the reference to our firm under the caption "Experts" in the Registration Statement (Form S-3 No. 333-183237) and related prospectus of AcclRx Pharmaceuticals, Inc. incorporated by reference into this Registration Statement.

/s/ Ernst & Young LLP
Redwood City, California
July 17, 2013