

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549**

FORM 8-A

**FOR REGISTRATION OF CERTAIN CLASSES OF SECURITIES
PURSUANT TO SECTION 12(b) OR 12(g) OF THE
SECURITIES EXCHANGE ACT OF 1934**

AcelRx Pharmaceuticals, Inc.

(Exact name of registrant as specified in its charter)

Delaware
(State of incorporation or organization)

41-2193603
(I.R.S. Employer Identification no.)

**575 Chesapeake Drive
Redwood City, CA**
(Address of principal executive offices)

94063
(Zip code)

Securities to be registered pursuant to Section 12(b) of the Act:

Title of each class
to be so registered

Name of exchange on which
each class is to be registered

Common Stock, \$0.001 par value per share

The NASDAQ Stock Market LLC

If this form relates to the registration of a class of securities pursuant to Section 12(b) of the Exchange Act and is effective pursuant to General Instruction A.(c), check the following box.

If this form relates to the registration of a class of securities pursuant to Section 12(g) of the Exchange Act and is effective pursuant to General Instruction A.(d), check the following box.

Securities Act registration statement file number to which the form relates: 333-170594

Securities to be registered pursuant to Section 12(g) of the Act: None

Item 1. Description of Registrant's Securities to be Registered.

A description of the common stock, \$0.001 par value per share, of AcelRx Pharmaceuticals, Inc., a Delaware corporation (the "Registrant"), to be registered hereunder is contained in the section entitled "Description of Capital Stock" in the prospectus included in the Registrant's Registration Statement of Form S-1 (File No. 333-170594), initially filed with the Securities and Exchange Commission (the "Commission") on November 12, 2010, as amended from time to time (the "Registration Statement"), and is incorporated herein by reference. Any form of prospectus subsequently filed by the Registrant with the Commission pursuant to Rule 424(b) under the Securities Act of 1933, as amended, that constitutes part of the Registration Statement shall be deemed to be incorporated herein by reference.

The Registrant's common stock has been approved for listing on The NASDAQ Global Market of The NASDAQ Stock Market LLC under the symbol "ACRX."

Item 2. Exhibits.

Under the instructions as to Exhibits with respect to Form 8-A, no exhibits are required to be filed, because no other securities of the Registrant are registered on the NASDAQ Stock Market LLC and the securities registered hereby are not being registered pursuant to Section 12(g) of the Securities Exchange Act of 1934, as amended.

SIGNATURE

Pursuant to the requirements of Section 12 of the Securities Exchange Act of 1934, the Registrant has duly caused this registration statement to be signed on its behalf by the undersigned, thereto duly authorized.

ACELRX PHARMACEUTICALS, INC.

Date: February 1, 2011

By: /s/ Richard A. King

Richard A. King
President and Chief Executive Officer