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

SCHEDULE 13G

**UNDER THE SECURITIES EXCHANGE ACT OF 1934
(Amendment No.)***

ACCELERON PHARMA INC.
(Name of Issuer)

COMMON STOCK
(Title of Class of Securities)

00434H108
(CUSIP Number)

December 31, 2013
(Date of Event Which Requires Filing of This Statement)

Check the appropriate box to designate the rule pursuant to which this Schedule is filed:

- Rule 13d-1(b)
 Rule 13d-1(c)
 Rule 13d-1(d)

* The remainder of this cover page shall be filled out for a reporting person's initial filing on this form with respect to the subject class of securities, and for any subsequent amendment containing information which would alter the disclosures provided in a prior cover page.

The information required in the remainder of this cover page shall not be deemed to be "filed" for the purpose of Section 18 of the Securities Exchange Act of 1934 ("Act") or otherwise subject to the liabilities of that section of the Act but shall be subject to all other provisions of the Act (however, see the Notes).

1.	Name of Reporting Persons Venrock Partners, L.P.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> ¹ (b) <input type="checkbox"/>	
3.	SEC USE ONLY	
4.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With:	5.	Sole Voting Power 0
	6.	Shared Voting Power 2,622,435 ²
	7.	Sole Dispositive Power 0
	8.	Shared Dispositive Power 2,622,435 ²
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,622,435 ²	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
11.	Percent of Class Represented by Amount in Row (9) 9.2% ³	
12.	Type of Reporting Person (See Instructions) PN	

- ¹ Venrock Partners, L.P., Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P., Venrock Partners Management, LLC (the general partner of Venrock Partners, L.P.), Venrock Management IV, LLC (the general partner of Venrock Associates IV, L.P.) and VEF Management IV, LLC (the general partner of Venrock Entrepreneurs Fund IV, L.P.) are members of a group for purposes of this Schedule 13G.
- ² Consists of 414,360 shares of common stock and warrants to purchase 20,963 shares of common stock owned by Venrock Partners, L.P., 2,032,352 shares of common stock and warrants to purchase 102,795 shares of common stock owned by Venrock Associates IV, L.P., and 49,440 shares of common stock and warrants to purchase 2,525 shares of common stock owned by Venrock Entrepreneurs Fund IV, L.P.
- ³ This percentage is calculated based upon the sum of (i) 28,348,633 shares of the Issuer's common stock outstanding as of January 1, 2014, as set forth in the Issuer's prospectus filed with the Securities and Exchange Commission on January 23, 2014 and (ii) 126,283 shares of common stock underlying warrants owned by the Reporting Persons.

1.	Name of Reporting Persons Venrock Associates IV, L.P.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> ¹ (b) <input type="checkbox"/>	
3.	SEC USE ONLY	
4.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With:	5.	Sole Voting Power 0
	6.	Shared Voting Power 2,622,435 ²
	7.	Sole Dispositive Power 0
	8.	Shared Dispositive Power 2,622,435 ²
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,622,435 ²	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
11.	Percent of Class Represented by Amount in Row (9) 9.2% ³	
12.	Type of Reporting Person (See Instructions) PN	

- ¹ Venrock Partners, L.P., Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P., Venrock Partners Management, LLC (the general partner of Venrock Partners, L.P.), Venrock Management IV, LLC (the general partner of Venrock Associates IV, L.P.) and VEF Management IV, LLC (the general partner of Venrock Entrepreneurs Fund IV, L.P.) are members of a group for purposes of this Schedule 13G.
- ² Consists of 414,360 shares of common stock and warrants to purchase 20,963 shares of common stock owned by Venrock Partners, L.P., 2,032,352 shares of common stock and warrants to purchase 102,795 shares of common stock owned by Venrock Associates IV, L.P., and 49,440 shares of common stock and warrants to purchase 2,525 shares of common stock owned by Venrock Entrepreneurs Fund IV, L.P.
- ³ This percentage is calculated based upon the sum of (i) 28,348,633 shares of the Issuer's common stock outstanding as of January 1, 2014, as set forth in the Issuer's prospectus filed with the Securities and Exchange Commission on January 23, 2014 and (ii) 126,283 shares of common stock underlying warrants owned by the Reporting Persons.

1.	Name of Reporting Persons Venrock Entrepreneurs Fund IV, L.P.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> ¹ (b) <input type="checkbox"/>	
3.	SEC USE ONLY	
4.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With:	5.	Sole Voting Power 0
	6.	Shared Voting Power 2,622,435 ²
	7.	Sole Dispositive Power 0
	8.	Shared Dispositive Power 2,622,435 ²
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,622,435 ²	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
11.	Percent of Class Represented by Amount in Row (9) 9.2% ³	
12.	Type of Reporting Person (See Instructions) PN	

- ¹ Venrock Partners, L.P., Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P., Venrock Partners Management, LLC (the general partner of Venrock Partners, L.P.), Venrock Management IV, LLC (the general partner of Venrock Associates IV, L.P.) and VEF Management IV, LLC (the general partner of Venrock Entrepreneurs Fund IV, L.P.) are members of a group for purposes of this Schedule 13G.
- ² Consists of 414,360 shares of common stock and warrants to purchase 20,963 shares of common stock owned by Venrock Partners, L.P., 2,032,352 shares of common stock and warrants to purchase 102,795 shares of common stock owned by Venrock Associates IV, L.P., and 49,440 shares of common stock and warrants to purchase 2,525 shares of common stock owned by Venrock Entrepreneurs Fund IV, L.P.
- ³ This percentage is calculated based upon the sum of (i) 28,348,633 shares of the Issuer's common stock outstanding as of January 1, 2014, as set forth in the Issuer's prospectus filed with the Securities and Exchange Commission on January 23, 2014 and (ii) 126,283 shares of common stock underlying warrants owned by the Reporting Persons.

1.	Name of Reporting Persons Venrock Partners Management, LLC	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> ¹ (b) <input type="checkbox"/>	
3.	SEC USE ONLY	
4.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With:	5.	Sole Voting Power 0
	6.	Shared Voting Power 2,622,435 ²
	7.	Sole Dispositive Power 0
	8.	Shared Dispositive Power 2,622,435 ²
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,622,435 ²	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
11.	Percent of Class Represented by Amount in Row (9) 9.2% ³	
12.	Type of Reporting Person (See Instructions) OO	

¹ Venrock Partners, L.P., Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P., Venrock Partners Management, LLC (the general partner of Venrock Partners, L.P.), Venrock Management IV, LLC (the general partner of Venrock Associates IV, L.P.) and VEF Management IV, LLC (the general partner of Venrock Entrepreneurs Fund IV, L.P.) are members of a group for purposes of this Schedule 13G.

² Consists of 414,360 shares of common stock and warrants to purchase 20,963 shares of common stock owned by Venrock Partners, L.P., 2,032,352 shares of common stock and warrants to purchase 102,795 shares of common stock owned by Venrock Associates IV, L.P., and 49,440 shares of common stock and warrants to purchase 2,525 shares of common stock owned by Venrock Entrepreneurs Fund IV, L.P.

³ This percentage is calculated based upon the sum of (i) 28,348,633 shares of the Issuer's common stock outstanding as of January 1, 2014, as set forth in the Issuer's prospectus filed with the Securities and Exchange Commission on January 23, 2014 and (ii) 126,283 shares of common stock underlying warrants owned by the Reporting Persons.

1.	Name of Reporting Persons Venrock Management IV, LLC	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> ¹ (b) <input type="checkbox"/>	
3.	SEC USE ONLY	
4.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With:	5.	Sole Voting Power 0
	6.	Shared Voting Power 2,622,435 ²
	7.	Sole Dispositive Power 0
	8.	Shared Dispositive Power 2,622,435 ²
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,622,435 ²	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
11.	Percent of Class Represented by Amount in Row (9) 9.2% ³	
12.	Type of Reporting Person (See Instructions) OO	

- ¹ Venrock Partners, L.P., Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P., Venrock Partners Management, LLC (the general partner of Venrock Partners, L.P.), Venrock Management IV, LLC (the general partner of Venrock Associates IV, L.P.) and VEF Management IV, LLC (the general partner of Venrock Entrepreneurs Fund IV, L.P.) are members of a group for purposes of this Schedule 13G.
- ² Consists of 420,764 shares of common stock and warrants to purchase 6,145 shares of common stock owned by Venrock Partners, L.P., 1,870,069 shares of common stock and warrants to purchase 27,315 shares of common stock owned by Venrock Associates IV, L.P., and 46,751 shares of common stock and warrants to purchase 682 shares of common stock owned by Venrock Entrepreneurs Fund IV, L.P.
- ³ This percentage is calculated based upon the sum of (i) 28,348,633 shares of the Issuer's common stock outstanding as of January 1, 2014, as set forth in the Issuer's prospectus filed with the Securities and Exchange Commission on January 23, 2014 and (ii) 126,283 shares of common stock underlying warrants owned by the Reporting Persons.

1.	Name of Reporting Persons VEF Management IV, LLC	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input checked="" type="checkbox"/> ¹ (b) <input type="checkbox"/>	
3.	SEC USE ONLY	
4.	Citizenship or Place of Organization Delaware	
Number of Shares Beneficially Owned by Each Reporting Person With:	5.	Sole Voting Power 0
	6.	Shared Voting Power 2,622,435 ²
	7.	Sole Dispositive Power 0
	8.	Shared Dispositive Power 2,622,435 ²
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,622,435 ²	
10.	Check if the Aggregate Amount in Row (9) Excludes Certain Shares (See Instructions) <input type="checkbox"/>	
11.	Percent of Class Represented by Amount in Row (9) 9.2% ³	
12.	Type of Reporting Person (See Instructions) OO	

¹ Venrock Partners, L.P., Venrock Associates IV, L.P., Venrock Entrepreneurs Fund IV, L.P., Venrock Partners Management, LLC (the general partner of Venrock Partners, L.P.), Venrock Management IV, LLC (the general partner of Venrock Associates IV, L.P.) and VEF Management IV, LLC (the general partner of Venrock Entrepreneurs Fund IV, L.P.) are members of a group for purposes of this Schedule 13G.

² Consists of 414,360 shares of common stock and warrants to purchase 20,963 shares of common stock owned by Venrock Partners, L.P., 2,032,352 shares of common stock and warrants to purchase 102,795 shares of common stock owned by Venrock Associates IV, L.P., and 49,440 shares of common stock and warrants to purchase 2,525 shares of common stock owned by Venrock Entrepreneurs Fund IV, L.P.

³ This percentage is calculated based upon the sum of (i) 28,348,633 shares of the Issuer's common stock outstanding as of January 1, 2014, as set forth in the Issuer's prospectus filed with the Securities and Exchange Commission on January 23, 2014 and (ii) 126,283 shares of common stock underlying warrants owned by the Reporting Persons.

Introductory Note: This Statement on Schedule 13G is filed on behalf of Venrock Partners, L.P., a limited partnership organized under the laws of the State of Delaware (“VP”), Venrock Associates IV, L.P., a limited partnership organized under the laws of the State of Delaware (“Venrock IV”), Venrock Entrepreneurs Fund IV, L.P., a limited partnership organized under the laws of the State of Delaware (“Entrepreneurs Fund”), Venrock Partners Management, LLC, a limited liability company organized under the laws of the State of Delaware (“VP Management”), Venrock Management IV, LLC, a limited liability company organized under the laws of the State of Delaware (“Venrock Management”) and VEF Management IV, LLC, a limited liability company organized under the laws of the State of Delaware (“VEF Management” and collectively with VP, Venrock IV, Entrepreneurs Fund and Venrock Management, the “Venrock Entities”) in respect of shares of common stock of Acceleron Pharma Inc.

Item 1.

- (a) Name of Issuer
Acceleron Pharma Inc.
- (b) Address of Issuer’s Principal Executive Offices
128 Sydney Street
Cambridge, MA 02139

Item 2.

- (a) Name of Person Filing
Venrock Partners, L.P.
Venrock Associates IV, L.P.
Venrock Entrepreneurs Fund IV, L.P.
Venrock Partners Management, LLC
Venrock Management IV, LLC
VEF Management IV, LLC
- (b) Address of Principal Business Office or, if none, Residence

New York Office:

530 Fifth Avenue

22nd Floor

New York, NY 10036

Palo Alto Office:

3340 Hillview Avenue

Palo Alto, CA 94304

Cambridge Office:

55 Cambridge Parkway

Suite 100

Cambridge, MA 02142

- (c) Citizenship
Each of VP, Venrock IV and Entrepreneurs Fund are limited partnerships organized in the State of Delaware. Each of VP Management, Venrock Management and VEF Management are limited liability companies organized in the State of Delaware.
- (d) Title of Class of Securities
Common Stock
- (e) CUSIP Number
00434H108

Item 3. If this statement is filed pursuant to §§240.13d-1(b), or 240.13d-2(b) or (c), check whether the person filing is a:

Not applicable

Item 4. Ownership

(a) Amount Beneficially Owned as of December 31, 2013:

Venrock Partners, L.P.	2,622,435(1)
Venrock Associates IV, L.P.	2,622,435(1)
Venrock Entrepreneurs Fund IV, L.P.	2,622,435(1)
Venrock Partners Management, LLC	2,622,435(1)
Venrock Management IV, LLC	2,622,435(1)
VEF Management IV, LLC	2,622,435(1)

(b) Percent of Class as of December 31, 2013:

Venrock Partners, L.P.	9.2%
Venrock Associates IV, L.P.	9.2%
Venrock Entrepreneurs Fund IV, L.P.	9.2%
Venrock Partners Management, LLC	9.2%
Venrock Management IV, LLC	9.2%
VEF Management IV, LLC	9.2%

(c) Number of shares as to which the person has, as of December 31, 2013:

(i) Sole power to vote or to direct the vote

Venrock Partners, L.P.	0
Venrock Associates IV, L.P.	0
Venrock Entrepreneurs Fund IV, L.P.	0
Venrock Partners Management, LLC	0
Venrock Management IV, LLC	0
VEF Management IV, LLC	0

(ii) Shared power to vote or to direct the vote

Venrock Partners, L.P.	2,622,435(1)
Venrock Associates IV, L.P.	2,622,435(1)
Venrock Entrepreneurs Fund IV, L.P.	2,622,435(1)
Venrock Partners Management, LLC	2,622,435(1)
Venrock Management IV, LLC	2,622,435(1)
VEF Management IV, LLC	2,622,435(1)

(IV) Sole power to dispose or to direct the disposition of

Venrock Partners, L.P.	0
Venrock Associates IV, L.P.	0
Venrock Entrepreneurs Fund IV, L.P.	0
Venrock Partners Management, LLC	0
Venrock Management IV, LLC	0
VEF Management IV, LLC	0

(iv) Shared power to dispose or to direct the disposition of

Venrock Partners, L.P.	2,622,435(1)
Venrock Associates IV, L.P.	2,622,435(1)
Venrock Entrepreneurs Fund IV, L.P.	2,622,435(1)
Venrock Partners Management, LLC	2,622,435(1)
Venrock Management IV, LLC	2,622,435(1)
VEF Management IV, LLC	2,622,435(1)

- (1) These shares are owned directly as follows: 414,360 shares of common stock and warrants to purchase 20,963 shares of common stock are owned by Venrock Partners, L.P., 2,032,352 shares of common stock and warrants to purchase 102,795 shares of common stock are owned by Venrock Associates IV, L.P., and 49,440 shares of common stock and warrants to purchase 2,525 shares of common stock are owned by Venrock Entrepreneurs Fund IV, L.P.

Item 5. Ownership of Five Percent or Less of a Class

If this statement is being filed to report the fact that as of the date hereof the reporting person has ceased to be the beneficial owner of more than five percent of the class of securities, check the following .

Item 6. Ownership of More than Five Percent on Behalf of Another Person

Not Applicable

Item 7. Identification and Classification of the Subsidiary Which Acquired the Security Being Reported on By the Parent Holding Company or Control Person.

Not Applicable

Item 8. Identification and Classification of Members of the Group

Not Applicable

Item 9. Notice of Dissolution of a Group

Not Applicable

Item 10. Certification

Not Applicable

SIGNATURE

After reasonable inquiry and to the best of my knowledge and belief, I certify that the information set forth in this Statement is true, complete and correct.

Dated: February 14, 2014

Venrock Partners, L.P.

By: Venrock Partners Management, LLC

Its General Partner

By: /s/ David L. Stepp
Authorized Signatory

Venrock Associates IV, L.P.

By: Venrock Management IV, LLC

Its General Partner

By: /s/ David L. Stepp
Authorized Signatory

Venrock Entrepreneurs Fund IV, L.P.

By: VEF Management IV, LLC

Its General Partner

By: /s/ David L. Stepp
Authorized Signatory

Venrock Management IV, LLC

By: /s/ David L. Stepp
Authorized Signatory

VEF Management IV, LLC

By: /s/ David L. Stepp
Authorized Signatory

Venrock Partners Management, LLC

By: /s/ David L. Stepp
Authorized Signatory

EXHIBITS

A: Joint Filing Agreement

EXHIBIT A

JOINT FILING AGREEMENT

In accordance with Rule 13d-1(k) under the Securities Exchange Act of 1934, as amended, the undersigned agree to the joint filing on behalf of each of them of a statement on Schedule 13G (including amendments thereto) with respect to the Common Stock of Acceleron Pharma Inc. and further agree that this agreement be included as an exhibit to such filing. Each party to the agreement expressly authorizes each other party to file on its behalf any and all amendments to such statement. Each party to this agreement agrees that this joint filing agreement may be signed in counterparts.

In evidence whereof, the undersigned have caused this Agreement to be executed on their behalf this 14th day of February, 2014.

Venrock Partners, L.P.

By: Venrock Partners Management, LLC

Its General Partner

By: /s/ David L. Stepp
Authorized Signatory

Venrock Management IV, LLC

By: /s/ David L. Stepp
Authorized Signatory

Venrock Associates IV, L.P.

By: Venrock Management IV, LLC

Its General Partner

By: /s/ David L. Stepp
Authorized Signatory

VEF Management IV, LLC

By: /s/ David L. Stepp
Authorized Signatory

Venrock Entrepreneurs Fund IV, L.P.

By: VEF Management IV, LLC

Its General Partner

By: /s/ David L. Stepp
Authorized Signatory

Venrock Partners Management, LLC

By: /s/ David L. Stepp
Authorized Signatory