
SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

SCHEDULE 13G

**INFORMATION TO BE INCLUDED IN STATEMENTS FILED PURSUANT TO RULES
13d-1(b), (c), AND (d) AND AMENDMENTS THERETO FILED
PURSUANT TO RULE 13d-2
(Amendment No.)**

Accelaron Pharma Inc.

(Name of Issuer)

Common Stock, \$0.001 par value per share
(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.	Names of Reporting Persons. I.R.S. Identification Nos. of above persons (entities only). Applied Genomic Technology Capital Fund, L.P.
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" 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 2,146,720
	7. Sole Dispositive Power -0-
	8. Shared Dispositive Power 2,146,720
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,146,720
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) 6.9%
12.	Type of Reporting Person (See Instructions) PN

1.	Names of Reporting Persons. I.R.S. Identification Nos. of above persons (entities only). AGTC Advisors Fund, L.P.
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" 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 129,759
	7. Sole Dispositive Power -0-
	8. Shared Dispositive Power 129,759
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 129,759
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) 0.4%
12.	Type of Reporting Person (See Instructions) PN

1.	Names of Reporting Persons. AGTC Partners, L.P.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" 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 2,276,479
	7.	Sole Dispositive Power -0-
	8.	Shared Dispositive Power 2,276,479
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,276,479	
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) 7.3%	
12.	Type of Reporting Person (See Instructions) PN	

1.	Names of Reporting Persons. NewcoGen Group, Inc.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" 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 2,276,479
	7.	Sole Dispositive Power -0-
	8.	Shared Dispositive Power 2,276,479
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,276,479	
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) 7.3%	
12.	Type of Reporting Person (See Instructions) CO	

1.	Names of Reporting Persons. Flagship Ventures Management, Inc.	
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" 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 2,276,479
	7.	Sole Dispositive Power -0-
	8.	Shared Dispositive Power 2,276,479
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,276,479	
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) 7.3%	
12.	Type of Reporting Person (See Instructions) CO	

1.	Names of Reporting Persons. I.R.S. Identification Nos. of above persons (entities only). Noubar B. Afeyan Ph.D.
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>
3.	SEC Use Only
4.	Citizenship or Place of Organization United States
Number of Shares Beneficially Owned by Each Reporting Person With:	5. Sole Voting Power 4,867
	6. Shared Voting Power 2,276,479
	7. Sole Dispositive Power 4,867
	8. Shared Dispositive Power 2,276,479
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,281,346
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) 7.3%
12.	Type of Reporting Person (See Instructions) IN

1.	Names of Reporting Persons. I.R.S. Identification Nos. of above persons (entities only). Edwin M. Kania, Jr.
2.	Check the Appropriate Box if a Member of a Group (See Instructions) (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/>
3.	SEC Use Only
4.	Citizenship or Place of Organization United States
Number of Shares Beneficially Owned by Each Reporting Person With:	5. Sole Voting Power 6,534
	6. Shared Voting Power 2,276,479
	7. Sole Dispositive Power 6,534 ¹
	8. Shared Dispositive Power 2,276,479
9.	Aggregate Amount Beneficially Owned by Each Reporting Person 2,283,013
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) 7.3% ²
12.	Type of Reporting Person (See Instructions) IN

¹ Represents 4,867 shares of Common Stock and an option to purchase an additional 1,667 shares of Common Stock exercisable within 60 days of December 31, 2013.

² The percentage ownership is based on an aggregate of 31,110,300 shares of Common Stock outstanding, which includes: (i) 31,108,633 shares of Common Stock reported in the Issuer's Current Report on Form 8-K, which was filed with the SEC on January 28, 2014 (the "Form 8-K"), and the Issuer's prospectus, which was filed with the SEC pursuant to Rule 424(b)(4) on January 22, 2014 in connection with the Issuer's underwritten public offering completed on January 28, 2014; and (ii) an option to purchase 1,667 additional shares of Common Stock held by Mr. Kania and exercisable within 60 days of December 31, 2013.

Item 1(a) Name of Issuer:
Accelaron Pharma, Inc.

Item 1(b) Address of Issuer's Principal Executive Offices:
128 Sidney Street
Cambridge, Massachusetts 02139 USA

Item 2(a) Name of Person Filing:
The reporting persons are:
Applied Genomic Technology Capital Fund, L.P. ("AGTC Fund")
AGTC Advisors Fund, L.P. ("Advisors Fund")
AGTC Partners, L.P. ("AGTC GP")
NewcoGen Group, Inc. ("NewcoGen")
Flagship Ventures Management, Inc. ("Flagship Management")
Noubar B. Afeyan, Ph.D. ("Mr. Afeyan")
Edwin M. Kania, Jr. ("Mr. Kania")

Item 2(b) Address of Principal Business Office or, if None, Residence:
The address of each of the reporting persons is:
c/o Flagship Ventures
One Memorial Drive, 7th Floor
Cambridge, Massachusetts 02142

Item 2(c) Citizenship:

AGTC Fund	Delaware limited partnership
Advisors Fund	Delaware limited partnership
AGTC GP	Delaware limited partnership
NewcoGen	Delaware corporation
Flagship Management	Delaware corporation
Mr. Afeyan	U.S. citizen
Mr. Kania	U.S. citizen

Item 2(d) Title of Class of Securities:

This Schedule 13G report relates to the Common Stock, par value \$0.001 per share ("Common Stock"), of Acceleron Pharma Inc.

Item 2(e) CUSIP Number:

00434H108

Item 3 Description of Person Filing:

Not applicable.

Item 4 Ownership:

(a) Amount Beneficially Owned:

As of December 31, 2013: (i) AGTC Fund was the record holder of 2,146,720 shares of Common Stock (the "AGTC Shares"); Advisors Fund was the record holder of 129,759 shares of Common Stock (the "Advisors Shares" and, collectively with the AGTC Shares, the "Shares").

NewcoGen is the general partner of AGTC GP, which is the general partner of AGTC Fund and Advisors Fund.

NewcoGen is a wholly-owned subsidiary of Flagship Management. Messrs. Afeyan and Kania are the directors of Flagship Management and, as such, have shared voting and dispositive power over the Shares.

Mr. Afeyan is the individual record holder of, and has sole voting and dispositive power over, 4,867 shares of Common Stock. Mr. Kania is the individual record holder of, and has sole voting and dispositive power over, 4,867 shares of Common Stock and an option to purchase an additional 1,667 shares of Common Stock and exercisable within 60 days of December 31, 2013.

Each of the Reporting Persons expressly disclaims beneficial ownership of the shares of Common Stock reported in this Schedule 13G except to the extent of its or his pecuniary interest in such shares.

(b) Percent of Class:

AGTC Fund	6.9%
Advisors Fund	0.4%
AGTC GP	7.3%
NewcoGen	7.3%
Flagship Management	7.3%
Mr. Afeyan	7.3%
Mr. Kania	7.3%

For each of the reporting persons other than Mr. Kania, the ownership percentages above are based on an aggregate of 31,108,633 shares of Common Stock outstanding, as reported in the Issuer's Current Report on Form 8-K, which was filed with the SEC on January 28, 2014 (the "Form 8-K"), and the Issuer's prospectus, which was filed with the SEC pursuant to Rule 424(b)(4) on January 22, 2014 in connection with the Issuer's underwritten public offering completed on January 28, 2014 (the "Prospectus"). Mr. Kania's ownership percentage above is based on an aggregate of 31,110,300 shares of Common Stock outstanding, which includes: (i) 31,108,633 shares of Common Stock reported in the Form 8-K and the Prospectus; and (ii) an option to purchase an additional 1,667 shares of Common Stock held by Mr. Kania and exercisable within 60 days of December 31, 2013.

(c) Number of Shares as to which the Person has:

Reporting Person	NUMBER OF SHARES OF COMMON STOCK			
	(i)	(ii)	(iii)	(iv)
AGTC Fund	0	2,146,720	0	2,146,720
Advisors Fund	0	129,759	0	129,759
AGTC GP	0	2,276,479	0	2,276,479
NewcoGen	0	2,276,479	0	2,276,479
Flagship Management	0	2,276,479	0	2,276,479
Mr. Afeyan	4,867	2,276,479	4,867	2,276,479
Mr. Kania	6,534	2,276,479	6,534	2,276,479

- (i) Sole power to vote or direct the vote
(ii) Shared power to vote or to direct the vote
(iii) Sole power to dispose or to direct the disposition of
(iv) Shared power to dispose or to direct the disposition of

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:

Each of the Reporting Persons expressly disclaims membership in a "Group" as defined in Rule 13d-1(b)(ii)(K).

Item 9 Notice of Dissolution of Group:

Not applicable.

Item 10

Certification:

Not applicable.

This Schedule 13G is not filed pursuant to Rule 13d-1(b) or Rule 13d-1(c).

SIGNATURES

After reasonable inquiry and to the best of the knowledge and belief of each of the undersigned, each of the undersigned hereby certifies that the information set forth in this statement is true, complete and correct.

DATED: February 10, 2014

**APPLIED GENOMIC TECHNOLOGY
CAPITAL FUND, L.P.**

By: AGTC Partners, L.P., its general partner

By: NewcoGen Group, Inc., its general partner

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

AGTC ADVISORS FUND, L.P.

By: AGTC Partners, L.P., its general partner

By: NewcoGen Group, Inc., its general partner

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

AGTC PARTNERS, L.P.

By: NewcoGen Group, Inc., its general partner

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

NEWCOGEN GROUP, INC.

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

FLAGSHIP VENTURES MANAGEMENT, INC.

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

/s/ Noubar B. Afeyan, Ph. D
NOUBAR B. AFEYAN, PH.D.

/s/ Edwin M. Kania, Jr.
EDWIN M. KANIA, JR.

Joint Filing Agreement

Pursuant to Rule 13d-1(k)(1) under the Securities Exchange Act of 1934, as amended, the undersigned hereby agree that only one statement containing the information required by Schedule 13G need be filed with respect to the ownership by each of the undersigned of the shares of Common Stock of Acceleron Pharma Inc. This Agreement may be executed in any number of counterparts, each of which shall be deemed an original.

EXECUTED as of this 10th day of February, 2014.

**APPLIED GENOMIC TECHNOLOGY
CAPITAL FUND, L.P.**

By: AGTC Partners, L.P., its general partner

By: NewcoGen Group, Inc., its general partner

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

AGTC ADVISORS FUND, L.P.

By: AGTC Partners, L.P., its general partner

By: NewcoGen Group, Inc., its general partner

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

AGTC PARTNERS, L.P.

By: NewcoGen Group, Inc., its general partner

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

NEWCOGEN GROUP, INC.

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

FLAGSHIP VENTURES MANAGEMENT, INC.

By: /s/ Noubar B. Afeyan, Ph. D.

Name: Noubar B. Afeyan, Ph. D.

Title: President

/s/ Noubar B. Afeyan, Ph. D.

NOUBAR B. AFEYAN, PH.D.

/s/ Edwin M. Kania, Jr.

EDWIN M. KANIA, JR.