

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

SCHEDULE 13G

Under the Securities Exchange Act of 1934

bluebird bio, Inc.

(Name of Issuer)

Common Stock

(Title of Class of Securities)

09609G100

(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 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)	
	ARCH Venture Fund VII, L.P.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP* (a) <input type="checkbox"/> (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 shares
	6	SHARED VOTING POWER 1,793,588
	7	SOLE DISPOSITIVE POWER 0 shares
	8	SHARED DISPOSITIVE POWER 1,793,588
9	AGGREGATE AMOUNT BENEFICIALLY OWNED BY EACH REPORTING PERSON 1,793,588	
10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES* <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 7.5%	
12	TYPE OF REPORTING PERSON* PN	

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY)	
	ARCH Venture Partners VII, L.P.	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP* (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION Delaware	
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11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 7.5%	
12	TYPE OF REPORTING PERSON* PN	

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY)	
	ARCH Venture Partners VII, LLC	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP* (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION Delaware	
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10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES* <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 7.5%	
12	TYPE OF REPORTING PERSON* OO	

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY) Keith Crandell	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP* (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION United States of America	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 0 shares
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10	CHECK IF THE AGGREGATE AMOUNT IN ROW (9) EXCLUDES CERTAIN SHARES* <input type="checkbox"/>	
11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 7.5%	
12	TYPE OF REPORTING PERSON* IN	

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY) Clinton Bybee	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP* (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION United States of America	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 0 shares
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11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 7.5%	
12	TYPE OF REPORTING PERSON* IN	

1	NAMES OF REPORTING PERSONS I.R.S. IDENTIFICATION NOS. OF ABOVE PERSONS (ENTITIES ONLY) Robert Nelsen	
2	CHECK THE APPROPRIATE BOX IF A MEMBER OF A GROUP* (a) <input type="checkbox"/> (b) <input type="checkbox"/>	
3	SEC USE ONLY	
4	CITIZENSHIP OR PLACE OF ORGANIZATION United States of America	
NUMBER OF SHARES BENEFICIALLY OWNED BY EACH REPORTING PERSON WITH	5	SOLE VOTING POWER 0 shares
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11	PERCENT OF CLASS REPRESENTED BY AMOUNT IN ROW (9) 7.5%	
12	TYPE OF REPORTING PERSON* IN	

Item 1(a). Name of Issuer

bluebird bio, Inc. (the "Issuer").

Item 1(b). Address of Issuer's Principal Executive Offices

840 Memorial Drive, 4th Floor, Cambridge, MA 02139

Item 2(a). Name of Person Filing

ARCH Venture Fund VII, L.P. ("ARCH Venture Fund VII"); ARCH Venture Partners VII, L.P. ("AVP VII LP"); ARCH Venture Partners VII, LLC ("AVP VII LLC") (collectively, the "Reporting Entities" and individually, each a "Reporting Entity"); and Keith Crandell ("Crandell"), Robert Nelsen ("Nelsen") and Clinton Bybee ("Bybee") (collectively, the "Managing Directors" and individually, each a "Managing Director"). The Reporting Entities and the Managing Directors collectively are referred to as the "Reporting Persons".

Item 2(b). Address of Principal Business Office or, if none, Residence

8725 W. Higgins Road, Suite 290, Chicago, IL 60631

Item 2(c). Citizenship

ARCH Venture Fund VII and AVP VII LP are limited partnerships organized under the laws of the State of Delaware. AVP VII LLC is a limited liability company organized under the laws of the State of Delaware. Each Managing Director is a US citizen.

Item 2(d). Title of Class of Securities

Common stock, par value \$0.01 per share.

Item 2(e). CUSIP Number

09609G100

Item 3. If this statement is filed pursuant to Rule 13d-1(b), or 13d-2(b) or (c), Check Whether the Person Filing is a:

Not Applicable.

Item 4. Ownership

(a) Amount beneficially owned:

ARCH Venture Fund VII is the record owner of 1,793,588 shares of Common Stock (the "Record Shares") as of December 31, 2013. AVP VII LP, as the sole general partner of ARCH Venture Fund VII, may be deemed to beneficially own the Record Shares. AVP VII LLC, as the sole general partner of AVP VII LP, may be deemed to beneficially own the Record Shares. As managing directors of AVP VII LLC, each Managing Director may also be deemed to share the power to direct the disposition and vote of the Record Shares.

(b) Percent of class:

In the aggregate, the Reporting Persons beneficially own approximately 7.5% of the outstanding shares of common stock of the Issuer, based upon 23,780,211 shares of common stock outstanding as of October 31, 2013 as reported on the Issuer's 10-Q as filed with the Securities and Exchange Commission on November 14, 2013.

- (c) Number of shares as to which such person has:
- (i) Sole power to vote or to direct the vote:
0 shares for each Reporting Person
 - (ii) Shared power to vote or to direct the vote:
Each of the Reporting Persons: 1,793,588
 - (iii) Sole power to dispose or to direct the disposition:
0 shares for each Reporting Person
 - (iv) Shared power to dispose or to direct the disposition:
Each of the Reporting Persons: 1,793,588

Each Reporting Person disclaims beneficial ownership of such shares of Common Stock except for the shares, if any, such Reporting Person holds of record.

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

Not Applicable.

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

Not Applicable.

Item 8. Identification and Classification of Members of the Group

Not Applicable.

Item 9. Notice of Dissolution of 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 5, 2014

ARCH VENTURE FUND VII, L.P.

By: ARCH Venture Partners VII, L.P.
its General Partner

By: ARCH Venture Partners VII, LLC
its General Partner

By: _____ *
Keith Crandell
Managing Director

ARCH VENTURE PARTNERS VII, L.P.

By: ARCH Venture Partners VII, LLC
its General Partner

By: _____ *
Keith Crandell
Managing Director

ARCH VENTURE PARTNERS VII, LLC

By: _____ *
Keith Crandell
Managing Director

Keith Crandell _____ *

Robert Nelsen _____ *

Clinton Bybee _____ *

* By: /s/ Mark McDonnell
Mark McDonnell as
Attorney-in-Fact

This Schedule 13G was executed by Mark McDonnell pursuant to Powers of Attorney attached hereto as Exhibit 2 and incorporated herein by reference.

Exhibit 1

AGREEMENT

Pursuant to Rule 13d-1-(k)(1) under the Securities Exchange Act of 1934, 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 shares of stock of bluebird bio, Inc.

This Agreement may be executed in any number of counterparts, each of which shall be deemed an original.

Dated: February 5, 2014

ARCH VENTURE FUND VII, L.P.

By: ARCH Venture Partners VII, L.P.
its General Partner

By: ARCH Venture Partners VII, LLC
its General Partner

By: _____
Keith Crandell
Managing Director

ARCH VENTURE PARTNERS VII, L.P.

By: ARCH Venture Partners VII, LLC
its General Partner

By: _____
Keith Crandell
Managing Director

ARCH VENTURE PARTNERS VII, LLC

By: _____
Keith Crandell
Managing Director

Keith Crandell _____
*

Robert Nelsen _____
*

Clinton Bybee _____
*

* By: /s/ Mark McDonnell
Mark McDonnell as
Attorney-in-Fact

This Agreement was executed by Mark McDonnell pursuant to Powers of Attorney attached hereto as Exhibit 2 and incorporated herein by reference.



Exhibit 2**POWERS OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Mark McDonnell his true and lawful attorney-in-fact, with full power of substitution, to sign any and all instruments, certificates and documents that may be necessary, desirable or appropriate to be executed on behalf of himself as an individual or in his capacity as a direct or indirect general partner, director, officer or manager of any partnership, corporation or limited liability company, pursuant to section 13 or 16 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and any and all regulations promulgated thereunder, and to file the same, with all exhibits thereto, and any other documents in connection therewith, with the Securities and Exchange Commission, and with any other entity when and if such is mandated by the Exchange Act or by the Financial Industry Regulatory Authority, granting unto said attorney-in-fact full power and authority to do and perform each and every act and thing necessary, desirable or appropriate, fully to all intents and purposes as he might or could do in person, thereby ratifying and confirming all that said attorney-in-fact, or his substitutes, may lawfully do or cause to be done by virtue hereof.

IN WITNESS WHEREOF, this Power of Attorney has been signed as of the 7th day of May, 2013.

ARCH VENTURE FUND VII, L.P.

By: ARCH Venture Partners VII, L.P.
its General Partner

By: ARCH Venture Partners VII, LLC.
its General Partner

By: /s/ Keith Crandell
Managing Director

ARCH VENTURE PARTNERS VII, L.P.

By: ARCH Venture Partners VII, LLC
its General Partner

By: /s/ Keith Crandell
Managing Director

ARCH VENTURE PARTNERS VII, LLC

By: /s/ Keith Crandell
Managing Director

/s/ Keith Crandell
Keith Crandell

/s/ Robert Nelsen
Robert Nelsen

/s/ Clinton Bybee

Clinton Bybee