

INITIAL STATEMENT OF BENEFICIAL OWNERSHIP OF SECURITIES

| OMB APPROVAL | |
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| OMB Number: | 3235-0104 |
| Estimated average burden hours per response: | 0.5 |

Filed pursuant to Section 16(a) of the Securities Exchange Act of 1934 or Section 30(h) of the Investment Company Act of 1940

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| 1. Name and Address of Reporting Person* <u>Arch Venture Fund VII LP</u> (Last) (First) (Middle) 8725 WEST HIGGINS ROAD SUITE 290 (Street) CHICAGO IL 60631 (City) (State) (Zip) | 2. Date of Event Requiring Statement (Month/Day/Year) 06/18/2013 | 3. Issuer Name and Ticker or Trading Symbol <u>bluebird bio, Inc.</u> [BLUE] | |
| | | 4. Relationship of Reporting Person(s) to Issuer (Check all applicable) Director <input checked="" type="checkbox"/> 10% Owner Officer (give title below) Other (specify below) | 5. If Amendment, Date of Original Filed (Month/Day/Year) 6. Individual or Joint/Group Filing (Check Applicable Line) Form filed by One Reporting Person <input checked="" type="checkbox"/> Form filed by More than One Reporting Person |

Table I - Non-Derivative Securities Beneficially Owned

| 1. Title of Security (Instr. 4) | 2. Amount of Securities Beneficially Owned (Instr. 4) | 3. Ownership Form: Direct (D) or Indirect (I) (Instr. 5) | 4. Nature of Indirect Beneficial Ownership (Instr. 5) |
|---------------------------------|---|--|---|
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Table II - Derivative Securities Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)

| 1. Title of Derivative Security (Instr. 4) | 2. Date Exercisable and Expiration Date (Month/Day/Year) | | 3. Title and Amount of Securities Underlying Derivative Security (Instr. 4) | | 4. Conversion or Exercise Price of Derivative Security | 5. Ownership Form: Direct (D) or Indirect (I) (Instr. 5) | 6. Nature of Indirect Beneficial Ownership (Instr. 5) |
|--|--|-----------------|---|----------------------------|--|--|---|
| | Date Exercisable | Expiration Date | Title | Amount or Number of Shares | | | |
| Series C Convertible Preferred Stock | (1) | (1) | Common Stock | 1,052,946 | (1) | D ⁽²⁾⁽³⁾ | |
| Series D Convertible Preferred Stock | (4) | (4) | Common Stock | 740,642 | (4) | D ⁽²⁾⁽³⁾ | |

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| 1. Name and Address of Reporting Person* <u>Arch Venture Fund VII LP</u> (Last) (First) (Middle) 8725 WEST HIGGINS ROAD SUITE 290 (Street) CHICAGO IL 60631 (City) (State) (Zip) |
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| 1. Name and Address of Reporting Person* <u>ARCH Venture Partners VII, L.P.</u> (Last) (First) (Middle) 8725 WEST HIGGINS ROAD SUITE 290 (Street) CHICAGO IL 60631 (City) (State) (Zip) |
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|---|
| 1. Name and Address of Reporting Person* <u>ARCH Venture Partners VII, LLC</u> (Last) (First) (Middle) 8725 WEST HIGGINS ROAD SUITE 290 (Street) CHICAGO IL 60631 |
|---|

| | | |
|--|---------|----------|
| (City) | (State) | (Zip) |
| 1. Name and Address of Reporting Person* | | |
| CRANDELL KEITH | | |
| (Last) | (First) | (Middle) |
| 8725 WEST HIGGINS ROAD | | |
| SUITE 290 | | |
| (Street) | | |
| CHICAGO | IL | 60631 |
| (City) | (State) | (Zip) |
| 1. Name and Address of Reporting Person* | | |
| BYBEE CLINTON | | |
| (Last) | (First) | (Middle) |
| 8725 WEST HIGGINS ROAD | | |
| SUITE 290 | | |
| (Street) | | |
| CHICAGO | IL | 60631 |
| (City) | (State) | (Zip) |
| 1. Name and Address of Reporting Person* | | |
| NELSEN ROBERT | | |
| (Last) | (First) | (Middle) |
| 8725 WEST HIGGINS ROAD | | |
| SUITE 290 | | |
| (Street) | | |
| CHICAGO | IL | 60631 |
| (City) | (State) | (Zip) |

Explanation of Responses:

1. The Series C Convertible Preferred Stock is convertible into Common Stock on an 18.967-for-one basis into the number of shares of Common Stock as shown in column 3 at any time at the holder's election, and automatically upon the closing of the Issuer's initial public offering, and has no expiration date.
2. Beneficial ownership consists of: 1,793,588 shares of Common Stock issuable upon conversion of shares of Series C Convertible Preferred Stock and Series D Convertible Preferred Stock held by ARCH Venture Fund VII, L.P. ("ARCH Fund VII").
3. The sole general partner of ARCH Fund VII is ARCH Venture Partners VII, L.P. ("ARCH Partners VII"), which may be deemed to be the beneficial owner of the shares held by ARCH Fund VII. The sole general partner of ARCH Partners VII is ARCH Venture Partners VII, LLC ("ARCH VII LLC"), which may be deemed to be the beneficial owner of the shares held by ARCH Fund VII. ARCH Partners VII and ARCH VII LLC disclaim beneficial ownership of such shares, except to the extent of any pecuniary interest therein. The managing directors of ARCH VII LLC are Keith Crandell, Clinton Bybee and Robert Nelsen, and they may be deemed to beneficially own the shares held by ARCH Fund VII. Messrs. Crandell, Bybee and Nelsen disclaim beneficial ownership of such shares, except to the extent of any pecuniary interest therein.
4. The Series D Convertible Preferred Stock is convertible into Common Stock on an 18.967-for-one basis into the number of shares of Common Stock as shown in column 3 at any time at the holder's election, and automatically upon the closing of the Issuer's initial public offering, and has no expiration date.

Remarks:

[By: /s/ Mark McDonnell, as Attorney-in-Fact for Keith Crandell, Managing Director of the general partner of the general partner of ARCH Fund VII](#) 06/18/2013

[By: /s/ Mark McDonnell, as Attorney-in-Fact for Keith Crandell, Managing Director of ARCH Partners VII](#) 06/18/2013

[By: /s/ Mark McDonnell, as Attorney-in-Fact for Keith Crandell, Managing Director of ARCH VII LLC](#) 06/18/2013

[By: /s/ Mark McDonnell, as Attorney-in-Fact for Keith Crandell](#) 06/18/2013

[By: /s/ Mark McDonnell, as Attorney-in-Fact for Clinton Bybee](#) 06/18/2013

[By: /s/ Mark McDonnell, as](#) 06/18/2013

Reminder: Report on a separate line for each class of securities beneficially owned directly or indirectly.

* If the form is filed by more than one reporting person, see Instruction 5 (b)(v).

** Intentional misstatements or omissions of facts constitute Federal Criminal Violations See 18 U.S.C. 1001 and 15 U.S.C. 78ff(a).

Note: File three copies of this Form, one of which must be manually signed. If space is insufficient, see Instruction 6 for procedure.

Persons who respond to the collection of information contained in this form are not required to respond unless the form displays a currently valid OMB Number.

POWER 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. This power of attorney is perpetual and shall survive the death, incapacity, dissolution or termination of the undersigned.

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/ Clint Bybee
Clinton Bybee