

|   |           |
|---|-----------|
| <b>OMB APPROVAL</b>                             |           |
| OMB Number:                                     | 3235-0287 |
| Estimated average burden<br>hours per response: | 0.5       |

Check this box if no longer subject to Section 16. Form 4 or Form 5 obligations may continue. See Instruction 1(b).

**STATEMENT OF CHANGES IN BENEFICIAL OWNERSHIP**

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

|  |   |   |
|--|---|---|
| 1. Name and Address of Reporting Person*<br><u>Walsh Jeffrey T.</u><br><br>(Last) (First) (Middle)<br>C/O BLUEBIRD BIO, INC.<br>60 BINNEY STREET<br><br>(Street)<br>CAMBRIDGE MA 02142<br><br>(City) (State) (Zip) | 2. Issuer Name and Ticker or Trading Symbol<br><u>bluebird bio, Inc. [ BLUE ]</u> | 5. Relationship of Reporting Person(s) to Issuer<br>(Check all applicable)<br><br>Director 10% Owner<br><input checked="" type="checkbox"/> Officer (give title below) <input checked="" type="checkbox"/> Other (specify below)<br><br><u>Chief Financial / and Strategy Officer</u> |
|  | 3. Date of Earliest Transaction (Month/Day/Year)<br><u>10/10/2017</u>             |   |
| 4. If Amendment, Date of Original Filed (Month/Day/Year)   |   |   |

**Table I - Non-Derivative Securities Acquired, Disposed of, or Beneficially Owned**

| 1. Title of Security (Instr. 3) | 2. Transaction Date (Month/Day/Year) | 2A. Deemed Execution Date, if any (Month/Day/Year) | 3. Transaction Code (Instr. 8) |   | 4. Securities Acquired (A) or Disposed Of (D) (Instr. 3, 4 and 5) |            |                           | 5. Amount of Securities Beneficially Owned Following Reported Transaction(s) (Instr. 3 and 4) | 6. Ownership Form: Direct (D) or Indirect (I) (Instr. 4) | 7. Nature of Indirect Beneficial Ownership (Instr. 4) |
|---------------------------------|--------------------------------------|--|--------------------------------|---|---|------------|---------------------------|---|--|---|
|                                 |                                      |  | Code                           | V | Amount  | (A) or (D) | Price                     |   |  |   |
| Common Stock                    | 10/10/2017                           |  | M                              |   | 4,900   | A          | \$5.5004                  | 32,205  | D  |   |
| Common Stock                    | 10/10/2017                           |  | S <sup>(1)</sup>               |   | 2,800   | D          | \$129.4283 <sup>(2)</sup> | 29,405  | D  |   |
| Common Stock                    | 10/10/2017                           |  | S <sup>(1)</sup>               |   | 1,600   | D          | \$130.2655 <sup>(3)</sup> | 27,805  | D  |   |
| Common Stock                    | 10/10/2017                           |  | S <sup>(1)</sup>               |   | 500   | D          | \$131.8                   | 27,305  | D  |   |

**Table II - Derivative Securities Acquired, Disposed of, or Beneficially Owned (e.g., puts, calls, warrants, options, convertible securities)**

| 1. Title of Derivative Security (Instr. 3) | 2. Conversion or Exercise Price of Derivative Security | 3. Transaction Date (Month/Day/Year) | 3A. Deemed Execution Date, if any (Month/Day/Year) | 4. Transaction Code (Instr. 8) |   | 5. Number of Derivative Securities Acquired (A) or Disposed of (D) (Instr. 3, 4 and 5) |       | 6. Date Exercisable and Expiration Date (Month/Day/Year) |                 | 7. Title and Amount of Securities Underlying Derivative Security (Instr. 3 and 4) | 8. Price of Derivative Security (Instr. 5) | 9. Number of derivative Securities Beneficially Owned Following Reported Transaction(s) (Instr. 4) | 10. Ownership Form: Direct (D) or Indirect (I) (Instr. 4) | 11. Nature of Indirect Beneficial Ownership (Instr. 4) |       |
|--|--|--------------------------------------|--|--------------------------------|---|--|-------|--|-----------------|---|--|--|---|--|-------|
|  |  |                                      |  | Code                           | V | (A)  | (D)   | Date Exercisable   | Expiration Date |   |  |  |   |  | Title |
| Stock Option (right to buy)                | \$5.5004   | 10/10/2017                           |  | M                              |   |  | 4,900 | (4)  | 01/16/2023      | Common Stock  | 4,900                                      | \$0.00   | 62,585  | D  |       |

**Explanation of Responses:**

- The sales reported in this Form 4 were effected pursuant to a Rule 10b5-1 trading plan adopted by the reporting person on December 23, 2016.
- The range of prices for the transaction reported on this line was \$129.00 to \$129.95. The average weighted price was \$129.4283. The reporting person will provide, upon request by the SEC, the issuer or a security holder of the issuer, full information regarding the number of shares sold at each separate price.
- The range of prices for the transaction reported on this line was \$130.00 to \$130.55. The average weighted price was \$130.2655. The reporting person will provide, upon request by the SEC, the issuer or a security holder of the issuer, full information regarding the number of shares sold at each separate price.
- This option to purchase shares of our common stock granted on January 16, 2013 with performance-based vesting criteria that were met as of January 1, 2013. The shares underlying these options vested as follows: 25% vested on January 1, 2014, with the remainder of the shares vesting in equal monthly installments over the following three years.

**Remarks:**

/s/ Jason F. Cole, Attorney-in-Fact 10/11/2017

\*\* Signature of Reporting Person Date

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 4 (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.