

| | |
|---|-----------|
| OMB APPROVAL | |
| OMB Number: | 3235-0287 |
| Estimated average burden 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* <u>Sullivan Eric</u> (Last) (First) (Middle) C/O BLUEBIRD BIO, INC. 60 BINNEY STREET (Street) CAMBRIDGE MA 02142 (City) (State) (Zip) | 2. Issuer Name and Ticker or Trading Symbol <u>bluebird bio, Inc. [BLUE]</u> | 5. Relationship of Reporting Person(s) to Issuer (Check all applicable) Director 10% Owner <input checked="" type="checkbox"/> Officer (give title below) Other (specify below) <u>Principal Accounting Officer</u> |
| | 3. Date of Earliest Transaction (Month/Day/Year) <u>07/06/2017</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 | 07/05/2017 | | M | | 250 | A | \$20.7 | 6,657 | D | |
| Common Stock | 07/05/2017 | | M | | 196 | A | \$24.47 | 6,853 | D | |
| Common Stock | 07/05/2017 | | M | | 201 | A | \$50.51 | 7,054 | D | |
| Common Stock | 07/05/2017 | | M | | 2,933 | A | \$56.3 | 9,987 | D | |
| Common Stock | 07/05/2017 | | S | | 3,580 | D | \$107.2936 ⁽¹⁾ | 6,407 | D | |
| Common Stock | 07/05/2017 | | S | | 733 ⁽²⁾ | D | \$107.2242 ⁽³⁾ | 5,674 | D | |
| Common Stock | | | | | | | | 300 | I | By spouse ⁽⁴⁾ |

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 Options (right to buy) | \$20.7 | 07/05/2017 | | M | | | 250 | (5) | 12/02/2023 | Common Stock | 250 | \$0.00 | 1,000 | D | |
| Stock Option (right to buy) | \$24.47 | 07/05/2017 | | M | | | 196 | (6) | 03/03/2024 | Common Stock | 196 | \$0.00 | 1,020 | D | |
| Stock Option (right to buy) | \$50.51 | 07/05/2017 | | M | | | 201 | (7) | 03/01/2026 | Common Stock | 201 | \$0.00 | 6,069 | D | |
| Stock Option (right to buy) | \$56.3 | 07/05/2017 | | M | | | 2,933 | (8) | 08/01/2026 | Common Stock | 2,933 | \$0.00 | 8,802 | D | |

Explanation of Responses:

1. The range in prices for the transaction reported on this line was \$107.25 to \$107.40. The average weighted price was \$107.2936. The reporting person will provide, upon request by the SEC, the issuer or security holder of the issuer, full information regarding the number of shares sold at each separate price.
2. Shares were sold to cover tax withholding obligations incurred in connection with the vesting of Restricted Stock Units.
3. The range in prices for the transaction reported on this line was \$107.15 to \$107.30. The average weighted price was \$107.2242. The reporting person will provide, upon request by the SEC, the issuer or security holder of the issuer, full information regarding the number of shares sold at each separate price.
4. Equity grants held by the reporting person's spouse, who is employed by the issuer
5. This option vests over a four-year period, at a rate of twenty-five percent (25%) on November 11, 2014 and in 36 equal monthly installments thereafter.
6. This option vests over a four-year period, at a rate of twenty-five percent (25%) on January 1, 2015 and in 36 equal monthly installments thereafter.
7. This option vests over a four-year period, at a rate of twenty-five percent (25%) on January 4, 2017, and in 36 equal monthly installments.
8. This option vests over a four-year period, at a rate of twenty-five percent (25%) on July 4, 2017 and in 36 equal monthly installments thereafter.

Remarks:

/s/ Jason F. Cole, Attorney-in-Fact 07/07/2017

** 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.