

STATEMENT OF CHANGES IN BENEFICIAL OWNERSHIP

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

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

OMB APPROVAL	
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1. Name and Address of Reporting Person * <u>Walsh Jeffrey T.</u> (Last) (First) (Middle) C/O BLUEBIRD BIO, INC. 150 SECOND STREET (Street) CAMBRIDGE MA 02141 (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) Chief Operating Officer
	3. Date of Earliest Transaction (Month/Day/Year) 12/09/2014	
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	12/09/2014		M		33,000	A	\$2.09	33,000	D	
Common Stock	12/09/2014		S ⁽¹⁾		12,483	D	\$76.2011 ⁽²⁾	20,517	D	
Commons Stock	12/09/2014		S ⁽¹⁾		19,222	D	\$77.1096 ⁽³⁾	1,295	D	
Common Stock	12/09/2014		S ⁽¹⁾		1,295	D	\$77.8856 ⁽⁴⁾	0	D	
Common Stock	12/10/2014		M		10,500	A	\$2.09	10,500	D	
Common Stock	12/10/2014		S ⁽¹⁾		6,539	D	\$81.6806 ⁽⁵⁾	3,961	D	
Common Stock	12/10/2014		S		3,961	D	\$82.6191 ⁽⁶⁾	0	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)	\$2.09	12/09/2014		M			33,000	(7)	07/13/2021	Common Stock	33,000	\$0.00	121,307	D	
Stock Option (right to buy)	\$2.09	12/10/2014		M			10,500	(7)	07/13/2021	Common Stock	10,500	\$0.00	110,807	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 October 11, 2013.
- The range of prices for the transaction reported on this line was \$75.70 to \$76.70. The average weighted price was \$76.2011. 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 \$76.71 to \$77.70. The average weighted price was \$77.1096. 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 \$77.71 to \$78.34. The average weighted price was \$77.8856. 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 \$81.32 to \$82.32. The average weighted price was \$81.6806. 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 \$82.33 to \$82.97. The average weighted price was \$82.6191. 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 vests over a four-year period, at a rate of twenty-five percent (25%) on May 16, 2012 and in 36 equal monthly installments thereafter.

Remarks:

/s/ Jason F. Cole, Attorney-in-Fact 12/11/2014

** 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.