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

FORM S-8
REGISTRATION STATEMENT
UNDER
THE SECURITIES ACT OF 1933

bluebird bio, Inc.

(Exact Name of Registrant as Specified in its Charter)

Delaware
(State or Other Jurisdiction of
Incorporation or Organization)

13-3680878
(I.R.S. Employer
Identification No.)

bluebird bio, Inc.
150 Second Street
Cambridge, MA 02141
(339) 499-9300

(Address of Principal Executive Offices)

2013 STOCK OPTION AND INCENTIVE PLAN
(Full Title of the Plan)

Nick Leschly
President and Chief Executive Officer
bluebird bio, Inc.
150 Second Street
Cambridge, MA 02141
(339) 499-9300

(Name and Address of Agent For Service)

Copy to:

Michael H. Bison, Esq.
Goodwin Procter LLP
Exchange Place
53 State Street
Boston, Massachusetts 02109
(617) 570-1000

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, or a smaller reporting company. See the definitions of “large accelerated filer,” “accelerated filer” and “smaller reporting company” in Rule 12b-2 of the Exchange Act.

Large accelerated filer

Accelerated filer

Non-accelerated filer (Do not check if a smaller reporting company)

Smaller reporting company

CALCULATION OF REGISTRATION FEE

Title of Securities to be Registered	Amount to be Registered ⁽¹⁾	Proposed Maximum Offering Price per Share ⁽²⁾	Proposed Maximum Aggregate Offering Price	Amount of Registration Fee ⁽³⁾
2013 Stock Option and Incentive Plan Common Stock, \$0.01 par value per share	960,320 shares	\$24.74	\$23,758,316.80	\$3,060.07

- (1) Pursuant to Rule 416 under the Securities Act of 1933, as amended (the “Securities Act”), this registration statement shall also cover any additional shares of common stock which become issuable under the above-named plan by reason of any stock dividend, stock split, recapitalization or any other similar transaction effected without the receipt of consideration which results in an increase in the number of our outstanding shares of common stock. Pursuant to Rule 416(c) under the Securities Act, this registration statement shall also cover an indeterminate amount of interests to be offered or sold pursuant to the employee benefit plan described herein.
- (2) The price of \$24.74 per share, which is the average of the high and low sale prices of the common stock of the registrant on the NASDAQ Global Select Market on March 3, 2014, is set forth solely for purposes of calculating the registration fee pursuant to Rules 457(c) and (h) of the Securities Act and has been used as these shares are without a fixed price.
- (3) Calculated pursuant to Section 6(b) of the Securities Act.
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This Registration Statement registers additional securities of the same class as other securities for which a registration statement filed on Form S-8 (SEC File No. 333-189560) of the Registrant is effective. The information contained in the Registrant's registration statement on Form S-8 (SEC File No. 333-189560) is hereby incorporated by reference pursuant to General Instruction E.

Part II

INFORMATION REQUIRED IN THE REGISTRATION STATEMENT

Item 8. Exhibits.

See the Exhibit Index on the page immediately preceding the exhibits for a list of exhibits filed as part of this registration statement, which Exhibit Index is incorporated herein by reference.

SIGNATURES

Pursuant to the requirements of the Securities Act of 1933, as amended, the registrant certifies that it has reasonable grounds to believe that it meets all of the requirements for filing on Form S-8 and has duly caused this registration statement to be signed on its behalf by the undersigned, thereunto duly authorized, in the City of Cambridge, Commonwealth of Massachusetts, on the 5th day of March, 2014.

bluebird bio, Inc.

By: /s/ Nick Leschly

Nick Leschly
President and Chief Executive Officer

POWER OF ATTORNEY

We, the undersigned officers and directors of bluebird bio, Inc., hereby severally constitute and appoint Nick Leschly and Jeffrey T. Walsh, and each of them singly (with full power to each of them to act alone), our true and lawful attorneys-in-fact and agents, with full power of substitution and resubstitution in each of them for him and in his name, place and stead, and in any and all capacities, to sign for us and in our names in the capacities indicated below any and all amendments (including post-effective amendments) to this registration statement, and to file the same, with all exhibits thereto and other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorneys-in-fact and agents, and each of them, full power and authority to do and perform each and every act and thing requisite or necessary to be done in and about the premises, as full to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorneys-in-fact and agents or any of them, or their or his substitute or substitutes, may lawfully do or cause to be done by virtue hereof.

Pursuant to the requirements of the Securities Act of 1933, as amended, this registration statement has been signed by the following persons in the capacities indicated below on the 5th day of March, 2014.

<u>Signature</u>	<u>Title</u>
<u>/s/ Nick Leschly</u> Nick Leschly	President and Chief Executive Officer (Principal Executive Officer)
<u>/s/ Jeffrey T. Walsh</u> Jeffrey T. Walsh	Chief Operating Officer and Secretary (Principal Financial Officer)
<u>/s/ Linda C. Bain</u> Linda C. Bain	Vice President, Finance and Business Operations and Treasurer (Principal Accounting Officer)
<u>/s/ Daniel S. Lynch</u> Daniel S. Lynch	Chairman of the Board
<u>/s/ Wendy L. Dixon, Ph.D.</u> Wendy L. Dixon, Ph.D.	Director
<u>/s/ Steven Gillis, Ph.D.</u> Steven Gillis, Ph.D.	Director
<u>/s/ John M. Maraganore, Ph.D.</u> John M. Maraganore, Ph.D.	Director
<u>/s/ James Mandell, M.D.</u> James Mandell, M.D.	Director

Signature

Title

/s/ David P. Schenkein, M.D.

David P. Schenkein, M.D.

Director

/s/ Robert I. Tepper

Robert I. Tepper

Director

EXHIBIT INDEX

<u>Exhibit No.</u>	<u>Description</u>
4.1	Specimen common stock certificate (Incorporated by reference to Exhibit 4.1 to the registrant's Registration Statement on Form S-1, as amended (File No. 333-188605)).
4.2	Amended and Restated Certificate of Incorporation (Incorporated by reference to Exhibit 3.1 to the registrant's Current Report on Form 8-K filed June 24, 2013 (File No. 001-35966)).
4.3	Amended and Restated Bylaws (Incorporated by reference to Exhibit 3.2 to the registrant's Current Report on Form 8-K filed June 24, 2013 (File No. 001-35966)).
5.1*	Opinion of Goodwin Procter LLP.
23.1*	Consent of Goodwin Procter LLP (included in Exhibit 5.1).
23.2*	Consent of Ernst & Young LLP.
23.3*	Consent of McGladrey LLP.
24.1	Power of attorney (included on signature page).

* Filed herewith.

March 5, 2014

bluebird bio, Inc.
150 Second Street
Cambridge, Massachusetts 02141

Re: Securities Being Registered under Registration Statement on Form S-8

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of a Registration Statement on Form S-8 (the "Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act"), on or about the date hereof relating to an aggregate of 960,320 shares (the "Shares") of Common Stock, \$0.01 par value per share, of bluebird bio, Inc., a Delaware corporation (the "Company"), that may be issued pursuant to the Company's 2013 Stock Option and Incentive Plan (the "Plan").

We have reviewed such documents and made such examination of law as we have deemed appropriate to give the opinions set forth below. We have relied, without independent verification, on certificates of public officials and, as to matters of fact material to the opinion set forth below, on certificates of officers of the Company.

The opinion set forth below is limited to the Delaware General Corporation Law (which includes reported judicial decisions interpreting the Delaware General Corporation Law).

For purposes of the opinion set forth below, we have assumed that a sufficient number of authorized but unissued shares of the Company's Common Stock will be available for issuance when the Shares are issued.

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, upon issuance and delivery against payment therefor in accordance with the terms of the Plan, will be validly issued, fully paid and nonassessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the Registration Statement. In giving our consent, we do not admit that we are in the category of persons whose consent is required under Section 7 of the Securities Act or the rules and regulations thereunder.

Very truly yours,

/S/ GOODWIN PROCTER LLP

GOODWIN PROCTER LLP

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the Registration Statement (Form S-8) pertaining to the 2013 Stock Option and Incentive Plan of bluebird bio, Inc. of our report dated March 5, 2014 with respect to the consolidated financial statements of bluebird bio, Inc. included in its Annual Report (Form 10-K) for the year ended December 31, 2013, filed with the Securities and Exchange Commission.

/s/ Ernst & Young LLP

Boston, Massachusetts
March 5, 2014

Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in this Registration Statement on Form S-8 of bluebird bio, Inc. of our report dated March 21, 2013 (June 3, 2013 for Reverse Stock Split paragraph in Note 2), relating to our audit of the consolidated financial statements for the year ended December 31, 2011, which appears in the Annual Report on Form 10-K of bluebird bio, Inc. for the year ended December 31, 2013.

/s/ McGladrey LLP

Boston, Massachusetts
March 5, 2014