

**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, D.C. 20549

**FORM S-1  
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)

**2836**  
(Primary Standard Industrial  
Classification Code Number)

**13-3680878**  
(I.R.S. Employer Identification Number)

**840 Memorial Drive, 4<sup>th</sup> Floor  
Cambridge, MA 02139  
(617) 491-5601**

(Address, including zip code, and telephone number, including area code, of registrant's principal executive offices)

**Nick Leschly  
President and Chief Executive Officer  
bluebird bio, Inc.  
840 Memorial Drive, 4<sup>th</sup> Floor  
Cambridge, MA 02139  
(617) 491-5601**

(Name, address, including zip code, and telephone number, including area code, of agent for service)

*Copies to:*

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

**Patrick O'Brien, Esq.  
Ropes & Gray LLP  
Prudential Tower  
800 Boylston Street  
Boston, MA 02199  
(617) 951-7000**

**Approximate date of commencement of proposed sale to public:** As soon as practicable after this Registration Statement is declared effective.

If any of the securities being registered on this Form are to be offered on a delayed or continuous basis pursuant to Rule 415 under the Securities Act of 1933, check the following box.

If this Form is filed to register additional securities for an offering pursuant to Rule 462(b) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.  333-188605

If this Form is a post-effective amendment filed pursuant to Rule 462(c) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

If this Form is a post-effective amendment filed pursuant to Rule 462(d) under the Securities Act, check the following box and list the Securities Act registration statement number of the earlier effective registration statement for the same offering.

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  Smaller reporting company   
(Do not check if a smaller reporting company)

**CALCULATION OF REGISTRATION FEE**

Title of each class of securities to be registered	Amount to be registered(1)	Proposed maximum aggregate offering price per share	Proposed maximum aggregate offering price	Amount of registration fee(2)
Common Stock, \$0.01 par value	1,082,352	\$17.00	\$18,399,984	\$2,509.76

(1) Represents only the additional number of shares being registered and includes 141,176 shares of common stock issuable upon exercise of the underwriters' option to purchase additional shares. Does not include the securities that the Registrant previously registered on the Registration Statement on Form S-1 (File No. 333-188605).

(2) The registration fee is calculated in accordance with Rule 457(a) under the Securities Act of 1933, as amended, based on the proposed maximum aggregate offering price. The registrant previously registered securities at an aggregate offering price not to exceed \$92,000,000 on a Registration Statement on Form S-1 (File No. 333-188605), which was declared effective by the Securities and Exchange Commission on June 18, 2013. In accordance with Rule 462(b) under the Securities Act, an additional amount of securities having a proposed maximum aggregate offering price of \$17.00 is hereby registered, which includes shares issuable upon the exercise of the underwriters' option to purchase additional shares.

**The Registration Statement shall become effective upon filing in accordance with Rule 462(b) promulgated under the Securities Act of 1933, as amended.**

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## **Explanatory note and incorporation by reference**

This Registration Statement is being filed pursuant to Rule 462(b) under the Securities Act of 1933, as amended (the "Securities Act"). The contents of the Registration Statement on Form S-1 (File No. 333-188605) filed by bluebird bio, Inc. with the Securities and Exchange Commission (the "Commission") pursuant to the Securities Act, which was declared effective by the Commission on June 18, 2013, are incorporated by reference into this Registration Statement.

The required opinion and consents are listed on an Exhibit Index attached hereto and filed herewith.

# Signatures

Pursuant to the requirements of the Securities Act of 1933, as amended, the Registrant has duly caused this Registration Statement on Form S-1 to be signed on its behalf by the undersigned, thereunto duly authorized, in the city of Cambridge, Commonwealth of Massachusetts, on the 18<sup>th</sup> day of June, 2013.

**bluebird bio, Inc.**

By: /s/ Nick Leschly

Nick Leschly  
President and Chief Executive Officer

Pursuant to the requirements of the Securities Act, this Registration Statement on Form S-1 has been signed by the following persons in the capacities and on the dates indicated.

<b>Signature</b>	<b>Title</b>	<b>Date</b>
<u>/s/ Nick Leschly</u> Nick Leschly	President, Chief Executive Officer and Director (Principal Executive Officer)	June 18, 2013
<u>/s/ Jeffrey T. Walsh</u> Jeffrey T. Walsh	Chief Operating Officer and Secretary (Principal Financial Officer)	June 18, 2013
* <u>Linda C. Bain</u>	Vice President, Finance and Business Operations and Treasurer (Principal Accounting Officer)	June 18, 2013
* <u>Daniel S. Lynch</u>	Chairman of the Board	June 18, 2013
* <u>Wendy L. Dixon, Ph.D.</u>	Director	June 18, 2013
* <u>Steven Gillis, Ph.D.</u>	Director	June 18, 2013
* <u>John M. Maraganore, Ph.D.</u>	Director	June 18, 2013
* <u>Geert-Jan Mulder, M.D.</u>	Director	June 18, 2013
* <u>Dr. Axel Polack</u>	Director	June 18, 2013
* <u>David P. Schenkein, M.D.</u>	Director	June 18, 2013
* <u>Robert I. Tepper, M.D.</u>	Director	June 18, 2013

\*By: /s/ Jeffrey T. Walsh

Jeffrey T. Walsh  
Attorney-in-fact

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# Exhibit index

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<b>Exhibit number</b>	<b>Description of exhibit</b>
5.1	Opinion of Goodwin Procter LLP.
23.1	Consent of Ernst & Young LLP.
23.2	Consent of McGladrey LLP.
23.3	Consent of Goodwin Procter LLP (included in Exhibit 5.1).
24.1*	Power of Attorney (included on signature page).

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\* Previously filed on the signature page to the Registrant's Registration Statement on Form S-1, as amended (File No. 333-188605), originally filed with the Securities and Exchange Commission on May 14, 2013 and incorporated by reference herein.

June 18, 2013

bluebird bio, Inc.  
840 Memorial Drive, 4<sup>th</sup> Floor  
Cambridge, MA 02139

Re: Securities Registered under Registration Statement on Form S-1

Ladies and Gentlemen:

We have acted as counsel to you in connection with your filing of (i) a Registration Statement on Form S-1 (File No. 333-188605) (the "Initial Registration Statement") pursuant to the Securities Act of 1933, as amended (the "Securities Act") and (ii) a second Registration Statement on Form S-1 filed pursuant to Rule 462(b) promulgated under the Securities Act (the "462(b) Registration Statement," and together with the Initial Registration Statement, the "Registration Statement"). This opinion letter is furnished to you in connection with your filing of the 462(b) Registration Statement, relating to the registration of the offering by bluebird bio, Inc., a Delaware corporation (the "Company") of up to 1,082,352 shares (the "Shares") of the Company's Common Stock, \$0.01 par value per share, including Shares purchasable by the underwriters upon their exercise of an over-allotment option granted to the underwriters by the Company. The Shares are being sold to the several underwriters named in, and pursuant to, an underwriting agreement among the Company and such underwriters.

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 opinions 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).

Based on the foregoing, we are of the opinion that the Shares have been duly authorized and, when the Shares have been issued and delivered against payment in accordance with the terms approved by a duly authorized committee of the Board of Directors, the Shares will be validly issued, fully paid and non-assessable.

We hereby consent to the inclusion of this opinion as Exhibit 5.1 to the 462(b) Registration Statement and to the references to our firm under the caption "Legal Matters" in 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 on Form S-1 filed pursuant to Rule 462(b) of the Securities Act of 1933 of the reference to our firm under the caption "Experts" and our report dated March 21, 2013 (except for Note 16(B), as to which the date is June 3, 2013) relating to the consolidated financial statements of bluebird bio, Inc. included in Amendment No. 2 to the Registration Statement (Form S-1 No. 333-188605) and related Prospectus of bluebird bio, Inc. for the registration of its common stock.

/s/ Ernst & Young LLP

Boston, Massachusetts  
June 14, 2013

**Consent of Independent Registered Public Accounting Firm**

We consent to the use in this Registration Statement on Form S-1 of bluebird bio, Inc. of our report dated March 21, 2013 (June 3, 2013 for Note 16(B)), relating to our audit of the consolidated financial statements, appearing in the Prospectus, which is part of this Registration Statement.

We also consent to the reference to our firm under the captions "Experts" in such Prospectus.

/s/ McGladrey LLP

Boston, Massachusetts

June 14, 2013