	Annual EPS	Annual Revenue	Rating/Target
Today's Changes	2013E $(1.79) from $(1.42) 2014E $(0.71) from $(0.63)	2013E $21.3M from $21.0M 2014E $27.3M, no change	No changes

bluebird bio

BLUE : NASDAQ : US$30.04

BUY

Target: US$45.00

Salveen Richter, CFA 212.389.8052
srichter@canaccordgenuity.com
Andrew Goldsmith, PhD 212.389.8053
agoldsmith@canaccordgenuity.com

COMPANY STATISTICS:

52-week Range:	24.00 - 36.25
Market Cap (M):	US$657
Avg. Daily Vol. (000s):	257
Shares Out (M):	21.869
Cash (M):	US$67.01

EARNINGS SUMMARY:

FYE Dec		2012A	2013E	2014E
EPS:		(13.79)	(1.79)	(0.71)
Revenue (M):	Q1	--	1.1A	--
	Q2	--	6.3A	--
	Q3	--	6.9	--
	Q4	--	6.9	--
Total		0.3	21.3	27.3
EPS:	Q1	--	(19.94)A	--
	Q2	--	(2.13)A	--
	Q3	--	(0.20)	--
	Q4	--	(0.25)	--
Total		(13.79)	(1.79)	(0.71)

SHARE PRICE PERFORMANCE:

Source: Interactive Data Corporation

COMPANY DESCRIPTION:

bluebird bio is a clinical-stage biotechnology company focused on gene therapy approaches to severe genetic and orphan disorders. The lead product is Lenti-D for CCALD. The second product is LentiGlobin for beta-thalassemia and sickle cell disease, and bluebird is also developing CAR T-based cancer therapies thorough a partnership with Celgene. bluebird is based in Cambridge, MA.

All amounts in US$ unless otherwise noted.

Life Sciences -- Biotechnology

Q2 EPS: CLINICAL TRIALS ON TRACK

BLUE reported Q2 GAAP EPS of $(2.13), below consensus of $(0.35) and CGe of $(0.92) primarily due to a higher share count following the IPO in June. We view BLUE as a leader in gene therapy and are optimistic on the odds for clinical success in both lead programs – particularly Lenti-D for childhood cerebral adrenoleukodystrophy (CCALD) given physician feedback and a P1/2 trial where three of four boys treated with an earlier version of Lenti-D demonstrated disease stabilization. The next key data catalysts will be interim data from one or both P1/2 LentiGlobin trials in late-2014.

- **Clinical trial timeframes on track:** BLUE reiterated guidance to initiate a P1/2 LentiGlobin trial in patients with beta-thalassemia the U.S. in mid-13 (recall, one P1/2 trial in the E.U. for patients with beta-thalassemia and sickle-cell disease has initiated). We model for pivotal beta-thalassemia trial initiation in mid-16, with launches in mid-20 (U.S.) and early-21 (E.U.) and peak LentiGlobin revenue recognized by BLUE of $1.23B in 2026. BLUE will also initiate a pivotal P2/3 trial of Lenti-D for CCALD in late-13 – we model for peak WW Lenti-D revenue recognized by BLUE of $212M in 2028.
- **Q2 financials:** BLUE reported $6.3M in revenue for Q2 (almost all due to recognized revenue from the CELG partnership), above consensus of $4.5M and in-line with CGe of $6.3M. BLUE exited Q2 with $228.8M in cash and equivalents, including $104.9M net from the initial public offering.

Figure 1: Q2/13 variance table

($thousands, except per share data)

	Jun 2Q13A	Jun 2Q13E	Variance A-E	Variance %	Y/Y %	Q/Q %
Revenue						
Lenti-D Total Revenue	$ -	$ -	-	n/a	n/a	n/a
Lenti-D - U.S.	-	-	-	n/a	n/a	n/a
Lenti-D - E.U.	-	-	-	n/a	n/a	n/a
LentiGlobin Total Revenue	$ -	$ -	-	n/a	n/a	n/a
LentiGlobin - U.S.	-	-	-	n/a	n/a	n/a
LentiGlobin - E.U.	-	-	-	n/a	n/a	n/a
Total other revenue	$ 6,334	$ 6,250	84	1%	7352%	462%
Collaboration revenue	6,249	6,250	(1)	0%	7252%	500%
Research and license fees	85	-	85	100%	n/a	0%
Grant revenue	-	-	-	n/a	n/a	n/a
Total Revenue	$ 6,334	$ 6,250	$ 84	1%	7352%	462%
COGS	-	-	-	n/a	n/a	n/a
Gross profit	6,334	6,250	84	1%	7352%	462%
Operating expense						
R&D (GAAP)	7,247	6,285	962	13%	116%	37%
SG&A (GAAP)	3,281	2,864	417	13%	147%	41%
Stock-based compensation	753	753	-	0%	n/a	8%
Total operating expense	10,528	9,149	1,379	13%	125%	38%
Operating income (loss)	(4,194)	(2,899)	(1,295)	31%	-9%	-35%
Other (expense) income, net	(389)	5	(394)	101%	-1151%	517%
Income Before Income Taxes	**(4,583)**	**(2,894)**	(1,689)	37%	0%	-30%
Income Tax Provision	-	-	-	n/a	n/a	n/a
Net loss applicable to common shareholders	$ (4,583)	$ (2,894)	(1,689)	37%	-22%	-30%
GAAP EPS (diluted)	$ (2.13)	$ (0.92)	(1.21)	57%	-91%	-89%
Weighted shares outstanding basic and diluted - GAAP	2,151	3,137	(986)	-46%	754%	555%

Source: Canaccord Genuity research, Company reports

Figure 2: Upcoming milestones

Product	Indication	Timing	Milestone
LentiGlobin	β-thalassemia	mid-13	Phase 1/2 U.S. trial (HGB-204) initation
Lenti-D	CCALD	4Q13	Pivotal Phase 2/3 U.S./E.U. pivotal trial (ALD-102) initation
LentiGlobin	SCD	2014	IND submission; U.S. Phase 1/2 trial initation
LentiGlobin	β-thalassemia / SCD	4Q14	Interim Phase 1/2 data
Lenti-D	CCALD	2H15	Interim Phase 2/3 data

Source: Canaccord Genuity research, Company reports

Figure 3: Changes to model

($thousands, except per share data)	FY13E		FY14E		FY15E		FY16E		FY17E		FY18E		FY19E		FY20E		FY21E		FY22E		FY23E	
	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior	New	Prior
Revenue																						
Lenti-D (CCALD) Total Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 3,152	$ 3,152	$ 30,577	$ 30,577	$ 70,093	$ 70,093	$ 115,317	$ 115,317	$ 143,128	$ 143,128	$ 162,538	$ 162,538
Lenti-D - U.S.	-	-	-	-	-	-	-	-	-	-	3,152	3,152	15,950	15,950	34,514	34,514	53,080	53,080	64,452	64,452	72,634	72,634
Lenti-D - E.U.	-	-	-	-	-	-	-	-	-	-	-	-	14,627	14,627	35,579	35,579	62,237	62,237	78,676	78,676	89,904	89,904
LentiGlobin (β-thalassemia) Total Revenue	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,456	$ 4,456	$ 147,849	$ 147,849	$ 403,487	$ 403,487	$ 723,633	$ 723,633
LentiGlobin - U.S.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4,456	4,456	19,409	19,409	41,421	41,421	62,027	62,027
LentiGlobin - E.U.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	128,440	128,440	362,066	362,066	661,605	661,605
Total other revenue	$ 21,294	$ 21,040	$ 27,325	$ 27,325	$ 27,325	$ 27,325	$ 7,533	$ 7,533	$ 1,163	$ 1,163	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue	$ 21,294	$ 21,040	$ 27,325	$ 27,325	$ 27,325	$ 27,325	$ 7,533	$ 7,533	$ 1,163	$ 1,163	$ 3,152	$ 3,152	$ 30,577	$ 30,577	$ 74,549	$ 74,549	$ 263,166	$ 263,166	$ 546,615	$ 546,615	$ 886,171	$ 886,171
COGS	-	-	-	-	-	-	-	-	-	-	788	788	6,727	6,727	14,910	14,910	47,370	47,370	98,391	98,391	159,511	159,511
Gross profit	21,294	21,040	27,325	27,325	27,325	27,325	7,533	7,533	1,163	1,163	2,364	2,364	23,850	23,850	59,639	59,639	215,796	215,796	448,224	448,224	726,660	726,660
Operating expense																						
R&D (GAAP)	28,482	26,110	29,015	28,083	30,289	29,533	31,503	31,503	33,593	33,593	35,605	35,605	37,504	37,504	39,481	39,481	41,502	41,502	44,689	43,550	47,590	45,503
SG&A (GAAP)	13,779	12,937	14,640	14,431	15,538	15,538	17,011	17,011	25,715	25,715	27,280	27,280	34,731	34,731	42,202	42,202	44,283	44,283	46,908	46,189	49,430	48,200
Stock-based compensation	3,174	3,174	3,623	3,623	4,231	4,231	4,805	4,805	5,580	5,580	6,253	6,253	7,080	7,080	8,101	8,101	9,111	9,111	10,034	10,034	11,003	11,003
Total operating expense	42,261	39,047	43,655	42,514	45,827	45,071	48,514	48,514	59,308	59,308	62,885	62,885	72,235	72,235	81,683	81,683	85,785	85,785	91,597	89,739	97,020	93,703
Operating income (loss)	(20,968)	(18,008)	(16,330)	(15,189)	(18,502)	(17,746)	(40,981)	(40,981)	(58,146)	(58,146)	(60,521)	(60,521)	(48,385)	(48,385)	(22,044)	(22,044)	130,011	130,011	356,627	358,485	629,640	632,957
Other (expense) income, net	(439)	(45)	6	6	4	4	7	6	10	10	8	8	6	6	5	5	12	12	38	37	91	91
Net gain (loss)	(21,407)	(18,053)	(16,324)	(15,183)	(18,498)	(17,742)	(40,974)	(40,975)	(58,136)	(58,136)	(60,513)	(60,514)	(48,379)	(48,379)	(22,038)	(22,039)	130,023	130,023	356,665	358,523	629,731	633,047
Income Tax Provision	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42,800	43,023	201,514	202,575
Net loss applicable to common shareholders	$ (21,407)	$ (18,053)	$ (16,324)	$ (15,183)	$ (18,498)	$ (17,742)	$ (40,974)	$ (40,975)	$ (58,136)	$ (58,136)	$ (60,513)	$ (60,514)	$ (48,379)	$ (48,379)	$ (22,038)	$ (22,039)	$ 130,023	$ 130,023	$ 313,865	$ 315,500	$ 428,217	$ 430,472
GAAP EPS (diluted)	$ (1.79)	$ (1.42)	$ (0.71)	$ (0.63)	$ (0.80)	$ (0.73)	$ (1.58)	$ (1.52)	$ (2.03)	$ (1.96)	$ (2.09)	$ (2.02)	$ (1.66)	$ (1.60)	$ (0.75)	$ (0.72)	$ 4.21	$ 4.07	$ 9.84	$ 9.57	$ 12.73	$ 12.39
Weighted shares outstanding basic and diluted	11,936	12,679	22,915	23,921	23,145	24,160	25,876	26,902	28,635	29,671	28,921	29,968	29,210	30,267	29,502	30,570	30,867	31,946	31,889	32,978	33,635	34,734

Source: Canaccord Genuity research, Company reports

Figure 4: BLUE Income statement

($thousands, except per share data)

	FY 2011A	FY 2012A	Mar 1Q13A	Jun 2Q13A	Sep 3Q13E	Dec 4Q13E	FY 2013E	FY 2014E	FY 2015E	FY 2016E	FY 2017E	FY 2018E	FY 2019E	FY 2020E	FY 2021E	FY 2022E	FY 2023E
Revenue																	
Lenti-D (CCALD) Total Revenue	$ -	$ -	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ 3,152	$ 30,577	$ 70,093	$ 115,317	$ 143,128	$ 162,538
Lenti-D - U.S.	-	-	-	-	-	-	-	-	-	-	-	3,152	15,950	34,514	53,080	64,452	72,634
Lenti-D - E.U.	-	-	-	-	-	-	-	-	-	-	-	-	14,627	35,579	62,237	78,676	89,904
LentiGlobin (β-thalassemia) Total Revenue	$ -	$ -	-	-	-	-	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ 4,456	$ 147,849	$ 403,487	$ 723,633
LentiGlobin - U.S.	-	-	-	-	-	-	-	-	-	-	-	-	-	4,456	19,409	41,421	62,027
LentiGlobin - E.U.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	128,440	362,066	661,605
Total other revenue	$ 882	$ 340	1,127	6,334	6,916	6,916	$ 21,294	$ 27,325	$ 27,325	$ 7,533	$ 1,163	$ -	$ -	$ -	$ -	$ -	$ -
Total Revenue	$ 882	$ 340	$ 1,127	$ 6,334	$ 6,916	$ 6,916	$ 21,294	$ 27,325	$ 27,325	$ 7,533	$ 1,163	$ 3,152	$ 30,577	$ 74,549	$ 263,166	$ 546,615	$ 886,171
COGS	-	-	-	-	-	-	-	-	-	-	-	788	6,727	14,910	47,370	98,391	159,511
Gross profit	882	340	1,127	6,334	6,916	6,916	21,294	27,325	27,325	7,533	1,163	2,364	23,850	59,639	215,796	448,224	726,660
Operating expense																	
R&D (GAAP)	11,409	17,210	5,284	7,247	7,701	8,250	28,482	29,015	30,289	31,503	33,593	35,605	37,504	39,481	41,502	44,689	47,590
SG&A (GAAP)	4,615	6,846	2,324	3,281	3,765	4,409	13,779	14,640	15,538	17,011	25,715	27,280	34,731	42,202	44,283	46,908	49,430
Total operating expense	16,024	24,056	7,608	10,528	11,466	12,659	42,261	43,655	45,827	48,514	59,308	62,885	72,235	81,683	85,785	91,597	97,020
Operating income (loss)	**(15,142)**	**(23,716)**	**(6,481)**	**(4,194)**	**(4,550)**	**(5,743)**	**(20,968)**	**(16,330)**	**(18,502)**	**(40,981)**	**(58,146)**	**(60,521)**	**(48,385)**	**(22,044)**	**130,011**	**356,627**	**629,640**
Other (expense) income, net	(456)	46	(63)	(389)	7	6	(439)	6	4	7	10	8	6	5	12	38	91
Net gain (loss)	**(15,598)**	**(23,670)**	**(6,544)**	**(4,583)**	**(4,543)**	**(5,737)**	**(21,407)**	**(16,324)**	**(18,498)**	**(40,974)**	**(58,136)**	**(60,513)**	**(48,379)**	**(22,038)**	**130,023**	**356,665**	**629,731**
Income Tax Provision	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42,800	201,514
Net loss applicable to common shareholders	$ (20,591)	$ (3,613)	$ (6,544)	$ (4,583)	$ (4,543)	$ (5,737)	$ (21,407)	$ (16,324)	$ (18,498)	$ (40,974)	$ (58,136)	$ (60,513)	$ (48,379)	$ (22,038)	$ 130,023	$ 313,865	$ 428,217
GAAP EPS (diluted)	$ (171.59)	$ (13.79)	$ (19.94)	$ (2.13)	$ (0.20)	$ (0.25)	$ (1.79)	$ (0.71)	$ (0.80)	$ (1.58)	$ (2.03)	$ (2.09)	$ (1.66)	$ (0.75)	$ 4.21	$ 9.84	$ 12.73
Weighted shares outstanding basic and diluted	120	262	328	2,151	22,576	22,689	11,936	22,915	23,145	25,876	28,635	28,921	29,210	29,502	30,867	31,889	33,635
Margin Analysis:																	
Cost of product sales	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	25%	22%	20%	18%	18%	18%
Product gross margin	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	75%	78%	80%	82%	82%	82%
R&D (GAAP)	nm	469%	469%	114%	111%	119%	134%	106%	111%	418%	2890%	1130%	123%	53%	16%	8%	5%
SG&A (GAAP)	nm	206%	206%	52%	54%	64%	65%	54%	57%	226%	2212%	866%	114%	57%	17%	9%	6%
Stock-based compensation expense	nm	18%	62%	12%	12%	13%	15%	13%	15%	64%	480%	198%	23%	11%	3%	2%	1%
Total operating expense	nm	nm	nm	166%	166%	183%	198%	160%	168%	644%	5102%	1995%	236%	110%	33%	17%	11%
Operating margin	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	49%	65%	71%
Income tax provision	nm	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	32%
Net margin (GAAP)	nm	nm	nm	-72%	-66%	-83%	-101%	-60%	-68%	-544%	-5001%	-1920%	-158%	-30%	49%	57%	48%
Y/Y change:																	
Total revenue	nm	nm	nm	nm	nm	nm	nm	28%	0%	-72%	-85%	171%	870%	144%	253%	108%	62%
Lenti-D revenue	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	870%	129%	65%	24%	14%
LentiGlobin revenue	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	nm	3218%	173%	79%
R&D (GAAP)	nm	51%	37%	nm	nm	nm	65%	2%	4%	4%	7%	6%	5%	5%	5%	8%	6%
SG&A (GAAP)	nm	48%	71%	nm	nm	nm	101%	6%	6%	9%	51%	6%	27%	22%	5%	6%	5%
Stock-based compensation expense	nm	0%	-13%	nm	nm	nm	297%	14%	17%	14%	16%	12%	13%	14%	12%	10%	10%
Total operating expense	nm	50%	46%	nm	nm	nm	76%	3%	5%	6%	22%	6%	15%	13%	5%	7%	6%
Operating income	nm	57%	26%	nm	nm	nm	-12%	-22%	13%	121%	42%	4%	-20%	-54%	-690%	174%	77%
Net income (GAAP)	nm	-82%	3%	nm	nm	nm	492%	-24%	13%	122%	42%	4%	-20%	-54%	-690%	141%	36%
GAAP EPS (diluted)	nm	-92%	-30%	nm	nm	nm	-87%	-60%	12%	98%	28%	3%	-21%	-55%	-664%	134%	29%
Shares outstanding - GAAP	nm	118%	47%	nm	nm	nm	4456%	92%	1%	12%	11%	1%	1%	1%	5%	3%	5%

Source: Canaccord Genuity research, Company reports

Valuation

We arrive at our 12-month price target of $45 via averaging two valuation methods: 1) a sum-of-the-parts discounted cash flow analysis equating to $46 a share which ascribes $14/share from Lenti-D, $23/share for LentiGlobin and $8/share in cash, with the following assumptions: we assign Lenti-D a 75% chance of success and LentiGlobin a 30% chance of success and we assign a WACC of 10% and a 1% terminal growth rate; and 2) a discounted EPS equating to $45/share, applying a 35x multiple to our FY22 fully diluted GAAP EPS estimate of $9.84, discounted back to mid-14 at 27%.

Investment risks

The primary risks for bluebird include the following:

1. Lenti-D clinical development risk: efficacy - will the Phase 2/3 trial demonstrate efficacy that compares favorably against the natural history trial (we note that the primary endpoint of no major functional disabilities is stringent and the new vector used in this trial has not been evaluated in the clinic; and safety -- will a safety signal emerge (particularly leukemia or pre-leukemic clonal expansion)?

2. LentiGlobin clinical development risk: efficacy -- will the two Phase 1/2 trials demonstrate efficacy in beta-thalassemia patients (particularly sufficient hemoglobin for patients to become transfusion independent) and safety?

3. Commercial risk, including the possibility that Lenti-D and LentiGlobin do not achieve the peak commercial revenue estimates in our model (due to patient identification, market size, penetration rates, and/or pricing/reimbursement -- particularly given the anticipated price of $1.5M+).

4. Regulatory risk: including failure to secure U.S. and E.U. approval for both Lenti-D and LentiGlobin.

5. Product competition, for Lenti-D, advances in hematopoietic stem cell transplant using non-related donors or other techniques to prevent demyelination or development of competing gene therapy techniques; for LentiGlobin, other gene therapy approaches or advances in the ability to upregulate the fetal gamma globin gene.

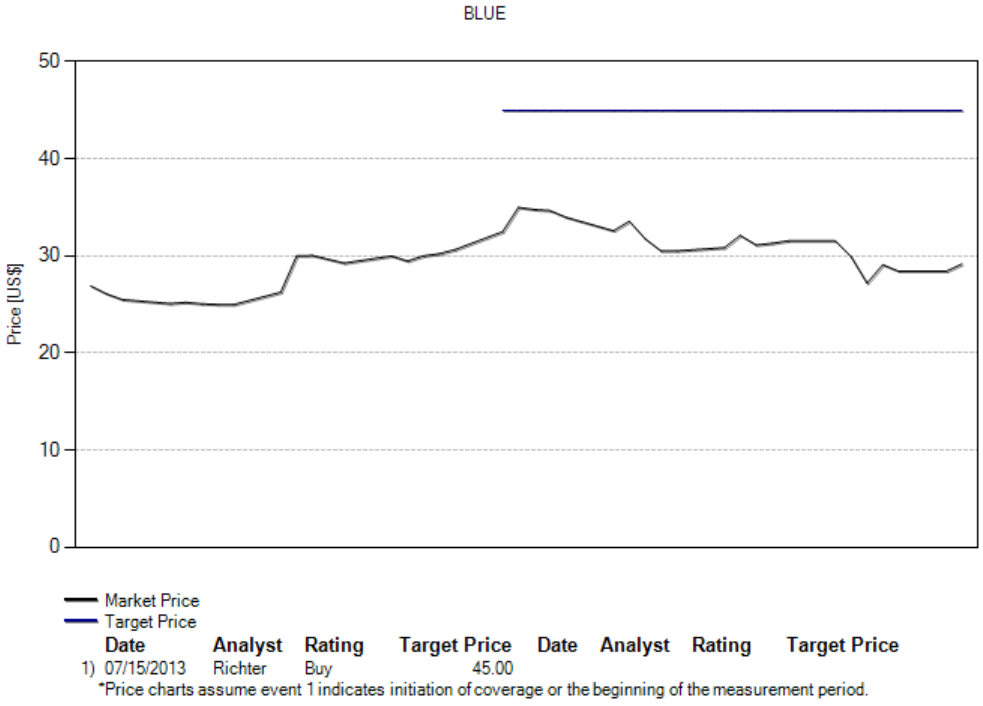
6. Financing risk -- we model for one equity offering ($200M; 5M shares @ $40/share) in mid-2016.

APPENDIX: IMPORTANT DISCLOSURES

Analyst Certification: Each authoring analyst of Canaccord Genuity whose name appears on the front page of this research hereby certifies that (i) the recommendations and opinions expressed in this research accurately reflect the authoring analyst's personal, independent and objective views about any and all of the designated investments or relevant issuers discussed herein that are within such authoring analyst's coverage universe and (ii) no part of the authoring analyst's compensation was, is, or will be, directly or indirectly, related to the specific recommendations or views expressed by the authoring analyst in the research.

Site Visit: An analyst has not visited the issuer's material operations.

Price Chart:*



	Date	Analyst	Rating	Target Price	Date	Analyst	Rating	Target Price
1)	07/15/2013	Richter	Buy	45.00				

*Price charts assume event 1 indicates initiation of coverage or the beginning of the measurement period.

Distribution of Ratings:
Global Stock Ratings
(as of 28 June 2013)

	Coverage Universe		IB Clients
Rating	#	%	%
Buy	568	59.1%	36.6%
Speculative Buy	58	6.0%	60.3%
Hold	288	30.0%	11.1%
Sell	47	4.9%	6.4%
	964*	100.0%	

*Total includes stocks that are Under Review

Canaccord Genuity Ratings System:

BUY: The stock is expected to generate risk-adjusted returns of over 10% during the next 12 months.
HOLD: The stock is expected to generate risk-adjusted returns of 0-10% during the next 12 months.
SELL: The stock is expected to generate negative risk-adjusted returns during the next 12 months.
NOT RATED: Canaccord Genuity does not provide research coverage of the relevant issuer.

"Risk-adjusted return" refers to the expected return in relation to the amount of risk associated with the designated investment or the relevant issuer.

Risk Qualifier: **SPECULATIVE:** Stocks bear significantly higher risk that typically cannot be valued by normal fundamental criteria. Investments in the stock may result in material loss.

Canaccord Genuity Research Disclosures as of 14 August 2013

Company	Disclosure
bluebird bio	1A, 2, 3, 5, 7

1	The relevant issuer currently is, or in the past 12 months was, a client of Canaccord Genuity or its affiliated companies. During this period, Canaccord Genuity or its affiliated companies provided the following services to the relevant issuer: A. investment banking services. B. non-investment banking securities-related services. C. non-securities related services.
2	In the past 12 months, Canaccord Genuity or its affiliated companies have received compensation for Corporate Finance/Investment Banking services from the relevant issuer.
3	In the past 12 months, Canaccord Genuity or any of its affiliated companies have been lead manager, co-lead manager or co-manager of a public offering of securities of the relevant issuer or any publicly disclosed offer of securities of the relevant issuer or in any related derivatives.
4	Canaccord Genuity acts as corporate broker for the relevant issuer and/or Canaccord Genuity or any of its affiliated companies may have an agreement with the relevant issuer relating to the provision of Corporate Finance/Investment Banking services.
5	Canaccord Genuity or one or more of its affiliated companies is a market maker or liquidity provider in the securities of the relevant issuer or in any related derivatives.
6	In the past 12 months, Canaccord Genuity, its partners, affiliated companies, officers or directors, or any authoring analyst involved in the preparation of this research has provided services to the relevant issuer for remuneration, other than normal course investment advisory or trade execution services.
7	Canaccord Genuity or one or more of its affiliated companies intend to seek or expect to receive compensation for Corporate Finance/Investment Banking services from the relevant issuer in the next six months.
8	The authoring analyst, a member of the authoring analyst's household, or any individual directly involved in the preparation of this research, has a long position in the shares or derivatives, or has any other financial interest in the relevant issuer, the value of which increases as the value of the underlying equity increases.
9	The authoring analyst, a member of the authoring analyst's household, or any individual directly involved in the preparation of this research, has a short position in the shares or derivatives, or has any other financial interest in the relevant issuer, the value of which increases as the value of the underlying equity decreases.
10	Those persons identified as the author(s) of this research, or any individual involved in the preparation of this research, have purchased/received shares in the relevant issuer prior to a public offering of those shares, and such person's name and details are disclosed above.
11	A partner, director, officer, employee or agent of Canaccord Genuity or its affiliated companies, or a member of his/her household, is an officer, or director, or serves as an advisor or board member of the relevant issuer and/or one of its subsidiaries, and such person's name is disclosed above.
12	As of the month end immediately preceding the date of publication of this research, or the prior month end if publication is within 10 days following a month end, Canaccord Genuity or its affiliated companies, in the aggregate, beneficially owned 1% or more of any class of the total issued share capital or other common equity securities of the relevant issuer or held any other financial interests in the relevant issuer which are significant in relation to the research (as disclosed above).
13	As of the month end immediately preceding the date of publication of this research, or the prior month end if publication is within 10 days following a month end, the relevant issuer owned 1% or more of any class of the total issued share capital in Canaccord Genuity or any of its affiliated companies.
14	Other specific disclosures as described above.

"Canaccord Genuity" is the business name used by certain wholly owned subsidiaries of Canaccord Financial Inc., including Canaccord Genuity Inc., Canaccord Genuity Limited, Canaccord Genuity Corp., and Canaccord Genuity (Australia) Limited, an affiliated company that is 50%-owned by Canaccord Financial Inc.

The authoring analysts who are responsible for the preparation of this research are employed by Canaccord Genuity Corp. a Canadian broker-dealer with principal offices located in Vancouver, Calgary, Toronto, Montreal, or Canaccord Genuity Inc., a US broker-dealer with principal offices located in New York, Boston, San Francisco and Houston, or Canaccord Genuity Limited., a UK broker-dealer with principal offices located in London (UK) and Dublin (Ireland), or Canaccord Genuity (Australia) Limited, an Australian broker-dealer with principal offices located in Sydney and Melbourne.

In the event that this is compendium research (covering six or more relevant issuers), Canaccord Genuity and its affiliated companies may choose to provide by reference specific disclosures of the subject companies or its policies and procedures regarding the dissemination of research. To access this material or for more

information, please refer to http://disclosures.canaccordgenuity.com/EN/Pages/default.aspx or send a request to Canaccord Genuity Corp. Research, Attn: Disclosures, P.O. Box 10337 Pacific Centre, 2200-609 Granville Street, Vancouver, BC, Canada V7Y 1H2 or disclosures@canaccordgenuity.com.

The authoring analysts who are responsible for the preparation of this research have received (or will receive) compensation based upon (among other factors) the Corporate Finance/Investment Banking revenues and general profits of Canaccord Genuity. However, such authoring analysts have not received, and will not receive, compensation that is directly based upon or linked to one or more specific Corporate Finance/Investment Banking activities, or to recommendations contained in the research.

Canaccord Genuity and its affiliated companies may have a Corporate Finance/Investment Banking or other relationship with the issuer that is the subject of this research and may trade in any of the designated investments mentioned herein either for their own account or the accounts of their customers, in good faith or in the normal course of market making. Accordingly, Canaccord Genuity or their affiliated companies, principals or employees (other than the authoring analyst(s) who prepared this research) may at any time have a long or short position in any such designated investments, related designated investments or in options, futures or other derivative instruments based thereon.

Some regulators require that a firm must establish, implement and make available a policy for managing conflicts of interest arising as a result of publication or distribution of research. This research has been prepared in accordance with Canaccord Genuity's policy on managing conflicts of interest, and information barriers or firewalls have been used where appropriate. Canaccord Genuity's policy is available upon request.

The information contained in this research has been compiled by Canaccord Genuity from sources believed to be reliable, but (with the exception of the information about Canaccord Genuity) no representation or warranty, express or implied, is made by Canaccord Genuity, its affiliated companies or any other person as to its fairness, accuracy, completeness or correctness. Canaccord Genuity has not independently verified the facts, assumptions, and estimates contained herein. All estimates, opinions and other information contained in this research constitute Canaccord Genuity's judgement as of the date of this research, are subject to change without notice and are provided in good faith but without legal responsibility or liability.

Canaccord Genuity's salespeople, traders, and other professionals may provide oral or written market commentary or trading strategies to our clients and our proprietary trading desk that reflect opinions that are contrary to the opinions expressed in this research. Canaccord Genuity's affiliates, principal trading desk, and investing businesses may make investment decisions that are inconsistent with the recommendations or views expressed in this research.

This research is provided for information purposes only and does not constitute an offer or solicitation to buy or sell any designated investments discussed herein in any jurisdiction where such offer or solicitation would be prohibited. As a result, the designated investments discussed in this research may not be eligible for sale in some jurisdictions. This research is not, and under no circumstances should be construed as, a solicitation to act as a securities broker or dealer in any jurisdiction by any person or company that is not legally permitted to carry on the business of a securities broker or dealer in that jurisdiction. This material is prepared for general circulation to clients and does not have regard to the investment objectives, financial situation or particular needs of any particular person. Investors should obtain advice based on their own individual circumstances before making an investment decision. To the fullest extent permitted by law, none of Canaccord Genuity, its affiliated companies or any other person accepts any liability whatsoever for any direct or consequential loss arising from or relating to any use of the information contained in this research.

For Canadian Residents: This research has been approved by Canaccord Genuity Corp., which accepts sole responsibility for this research and its dissemination in Canada. Canadian clients wishing to effect transactions in any designated investment discussed should do so through a qualified salesperson of Canaccord Genuity Corp. in their particular province or territory.

For United States Residents: Canaccord Genuity Inc., a US registered broker-dealer, accepts responsibility for this research and its dissemination in the United States. This research is intended for distribution in the United States only to certain US institutional investors. US clients wishing to effect transactions in any designated investment discussed should do so through a qualified salesperson of Canaccord Genuity Inc. Analyst(s) preparing this report that are not employed by Canaccord Genuity Inc. are resident outside the United States and are not associated persons or employees of any US regulated broker-dealer. Such analyst(s) may not be subject to Rule 2711 restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

For United Kingdom and European Residents: This research is distributed in the United Kingdom and elsewhere Europe, as third party research by Canaccord Genuity Limited, which is authorized and regulated by the Financial Conduct Authority. This research is for distribution only to persons who are Eligible Counterparties or Professional Clients only and is exempt from the general restrictions in section 21 of the Financial Services and Markets Act 2000 on the communication of invitations or inducements to engage in investment activity on the grounds that it is being distributed in the United Kingdom only to persons of a kind described in Article 19(5) (Investment Professionals) and 49(2) (High Net Worth companies, unincorporated associations etc) of the Financial

Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended). It is not intended to be distributed or passed on, directly or indirectly, to any other class of persons. This material is not for distribution in the United Kingdom or elsewhere in Europe to retail clients, as defined under the rules of the Financial Conduct Authority.

For Jersey, Guernsey and Isle of Man Residents:

This research is sent to you by Canaccord Genuity Wealth (International) Limited (CGWI) for information purposes and is not to be construed as a solicitation or an offer to purchase or sell investments or related financial instruments. This research has been produced by an affiliate of CGWI for circulation to its institutional clients and also CGWI. Its contents have been approved by CGWI and we are providing it to you on the basis that we believe it to be of interest to you. This statement should be read in conjunction with your client agreement, CGWI's current terms of business and the other disclosures and disclaimers contained within this research. If you are in any doubt, you should consult your financial adviser.
CGWI is licensed and regulated by the Guernsey Financial Services Commission, the Jersey Financial Services Commission and the Isle of Man Financial Supervision Commission. CGWI is registered in Guernsey and is a wholly owned subsidiary of Canaccord Financial Inc.

For Australian Residents:

This research is distributed in Australia by Canaccord Genuity (Australia) Limited ABN 19 075 071 466 holder of AFS Licence No 234666. To the extent that this research contains any advice, this is limited to general advice only. Recipients should take into account their own personal circumstances before making an investment decision. Clients wishing to effect any transactions in any financial products discussed in the research should do so through a qualified representative of Canaccord Genuity (Australia) Limited. Canaccord Genuity Wealth Management is a division of Canaccord Genuity (Australia) Limited.

Additional information is available on request.