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

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of The Securities Exchange Act of 1934

Date of Report (Date of Earliest Event Reported): January 9, 2017

bluebird bio, Inc.
(Exact name of registrant as specified in its charter)

DELAWARE	**001-35966**	**13-3680878**
(State or other jurisdiction of incorporation)	(Commission File Number)	(I.R.S. Employer Identification No.)

150 Second Street Cambridge, MA	**02141**
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code (339) 499-9300

Not Applicable
(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 2.02 Results of Operations and Financial Condition.

The Company intends to share with investors the amount of cash, cash equivalents and marketable securities it had on hand as of December 31, 2016. Although the Company has not finalized its financial results for the twelve months ended December 31, 2016, the Company currently anticipates that its cash, cash equivalents and marketable securities were approximately $885 million as of December 31, 2016. This information is unaudited and does not present all information necessary for an understanding of the Company's financial condition as of December 31, 2016 and its results of operations for the twelve months ended December 31, 2016. The Company expects to announce its full results for the twelve months ended December 31, 2016 on or before March 1, 2017.

Item 7.01 Regulation FD Disclosure.

The Company will be conducting meetings with investors attending the 35th Annual J.P. Morgan Healthcare Conference in San Francisco beginning on January 9, 2017. As part of these meetings, the Company will deliver the slide presentation furnished to this report as Exhibit 99.1 and which is incorporated herein by reference.

See Item 2.02 above, which is incorporated by reference herein.

The information in this report furnished pursuant to Items 2.02 and 7.01 shall not be deemed "filed" for the purposes of Section 18 of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), or otherwise subject to the liabilities of that section. It may only be incorporated by reference in another filing under the Exchange Act or the Securities Act of 1933, as amended, if such subsequent filing specifically references the information furnished pursuant to Items 2.02 and 7.01 of this report.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
99.1	Investor presentation furnished by bluebird bio, Inc. on January 9, 2017.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

Date: January 9, 2017

bluebird bio, Inc.

By:/s/ Jason F. Cole
Jason F. Cole
Chief Legal Officer

EXHIBIT INDEX

Exhibit No.	Description
99.1	Investor presentation furnished by bluebird bio, Inc. on January 9, 2017.


bluebirdbio®
Corporate Overview
January 2017
Nasdaq : BLUE

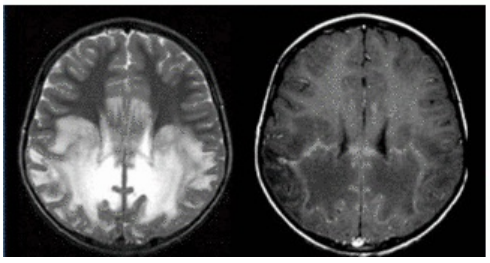
Forward Looking Statements

These slides and the accompanying oral presentation contain forward-looking statements and information. The use of words such as "may," "might," "will," "should," "expect," "plan," "anticipate," "believe," "estimate," "project," "intend," "future," "potential," or "continue," and other similar expressions are intended to identify forward-looking statements. For example, all statements we make regarding the initiation, timing, progress and results of our preclinical and clinical studies and our research and development programs, our ability to advance product candidates into, and successfully complete, clinical studies, and the timing or likelihood of regulatory filings and approvals are forward looking. All forward-looking statements are based on estimates and assumptions by our management that, although we believe to be reasonable, are inherently uncertain. All forward-looking statements are subject to risks and uncertainties that may cause actual results to differ materially from those that we expected. These statements are also subject to a number of material risks and uncertainties that are described in our most recent quarterly report on Form 10-Q, as well as our subsequent filings with the Securities and Exchange Commission. Any forward-looking statement speaks only as of the date on which it was made. We undertake no obligation to publicly update or revise any forward-looking statement, whether as a result of new information, future events or otherwise, except as required by law.

OUR VISION:

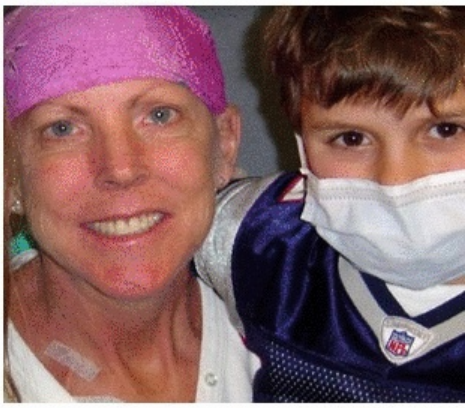
Make Hope a Reality

OUR PATIENTS

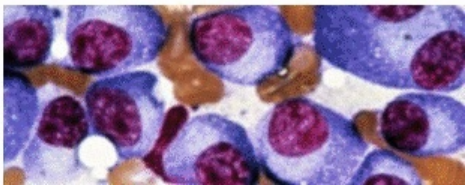


BLUE MOJO

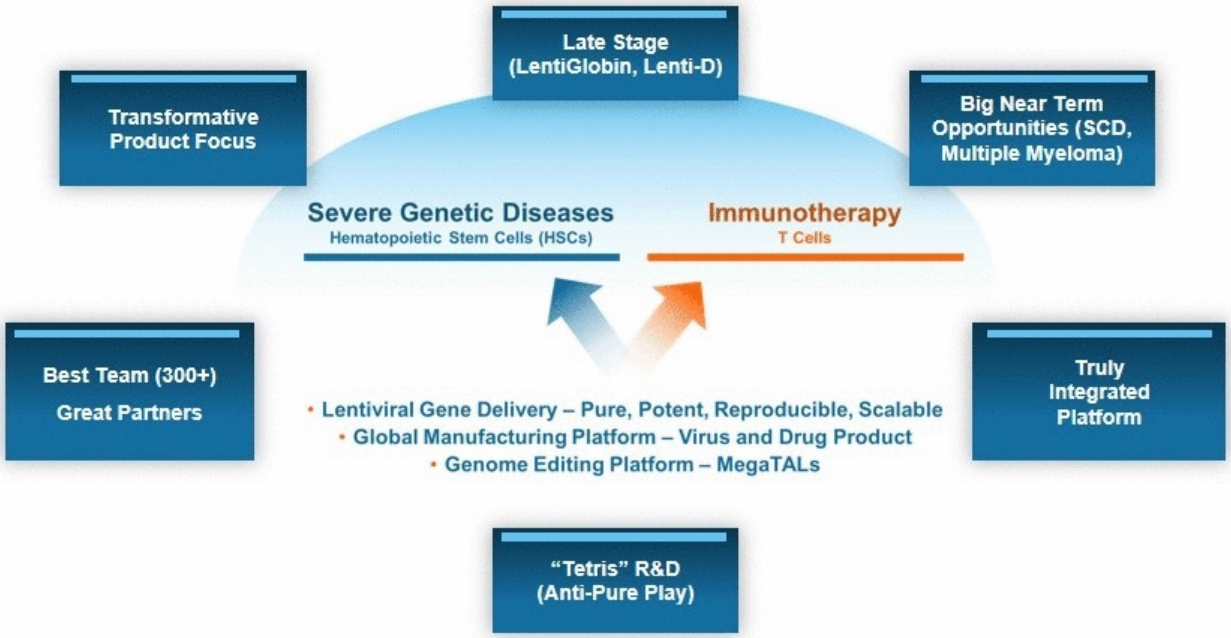
TRUE BLUE



OUR PEOPLE

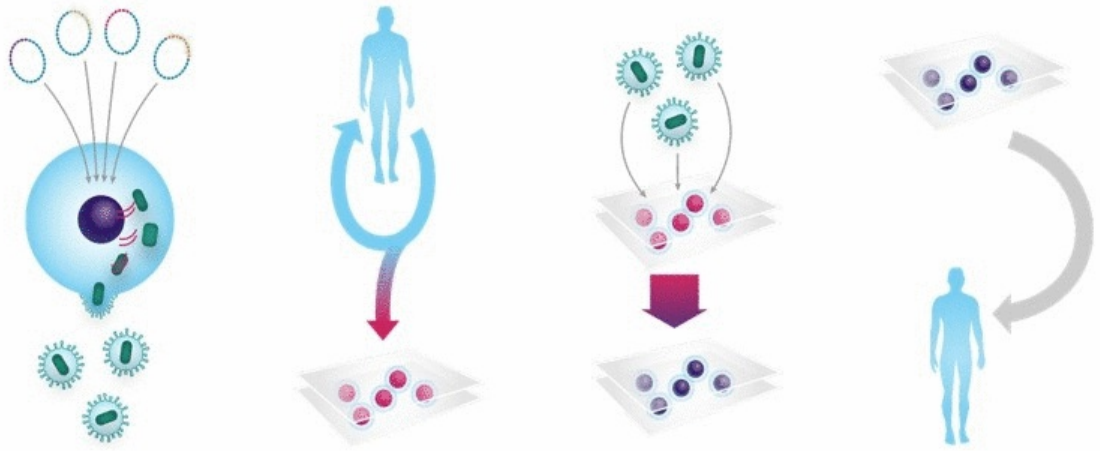


Our Strategic Intent



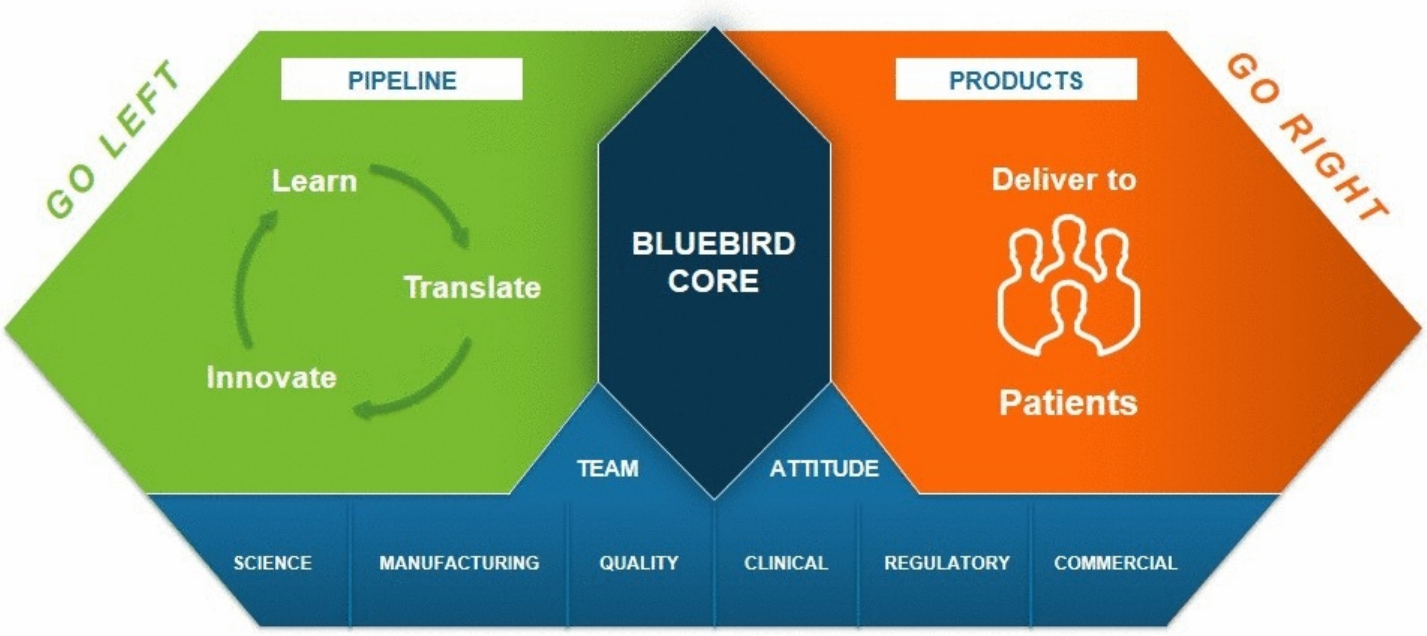
How Our Gene Therapy Approach Works

1	2	3	4
Produce Viral Particle With Therapeutic Payload	Isolate Target Cells From Patient	Transduce Target Cells ex vivo	Test & Re-infuse Gene Modified Cells



Viral Particle | Targeted Cells | Gene Modified Cells

Focused on Building Left & Right Around the Core



bluebird Pipeline Overview

Product Candidates	Program Area	Preclinical	Phase 1/2	Phase 2/3	Rights/Partner
	CNS Diseases				
Lenti-D™ Drug Product	Cerebral ALD				Worldwide
	Rare Hemoglobinopathies				
LentiGlobin® Drug Product	Transfusion-Dependent ß-thalassemia*			(Phase 3)	Worldwide
	Severe Sickle Cell Disease				Worldwide
	Oncology				
bb2121 BCMA	Multiple Myeloma				Celgene
Next Gen BCMA	Multiple Myeloma				Celgene
Five Prime Target	Undisclosed				Worldwide
HPV-16 E6 TCR	HPV-associated Cancers				Kite Pharma
Viromed Target	Undisclosed				Worldwide excluding Korea
Medigene Targets	Undisclosed				Worldwide
Other Programs	Undisclosed				Worldwide
	Research				
Early Pipeline	Undisclosed + Gene Editing				Worldwide

*The current clinical trials for LentiGlobin are Phase 1/2 studies that may provide the basis for early conditional approval in some jurisdictions

COLLABORATORS

apceth, Baylor College of Medicine, Boston Children's Hospital, Celgene, FivePrime, Kite Pharma, Lonza, medigene, Seattle Children's, ViroMed

Good Is Never Good Enough For Patients: BLUE Toolbox Strategy

Where We Ended 2016

- Strong momentum across all programs heading into 2017
- TDT data & VCN enhancers driving aggressive clinical/regulatory path
- SCD modifications underway, including strong start with VCN enhancers
- Exciting (early) multiple myeloma BCMA data
- Significant growth while maintaining our cultural DNA
- $885 million cash and investments as of 12/31/16 (unaudited)
  Cash runway into 2H19

How Do We Get There?
Data, Execution and Development in 2017

Context for 2017


World-class Gene Therapy Platform
and Integrated Global Capabilities
2022
THE GENE THERAPY PRODUCT COMPANY
Patient Impact
2+ Products on the Market
2+ Programs Nearing Commercialization
4+ Additional Programs in the Clinic
12


bluebirdbio®
Program Summaries
Nasdaq : BLUE

bb2121 Current Status

- **Preliminary results suggest bb2121 demonstrated objective responses in heavily pretreated patients with multiple myeloma**
  - Patients in the second cohort achieved stringent complete responses and/or elimination of minimal residual disease
  - 100% ORR (6/6) with doses above $5x10^7$ CAR+ T cells
- **bb2121 has been well tolerated, with mild-to-moderate cytokine release syndrome reported as of November data cut-off**
  - No dose-limiting toxicities yet identified and dose escalation continues
- **Dose escalation and expansion will continue to identify recommended phase 2 dose**

bb2121 anti-BCMA CAR T therapy may offer a promising new treatment paradigm for patients suffering from multiple myeloma

Data as of Nov 18, 2016

LentiGlobin Current Status: TDT*

- **LentiGlobin treatment shows promising results in TDT**
  - Patients with non-β^0/β^0 genotypes and ≥12 months follow-up remain free of RBC transfusions
  - Clinically meaningful reductions in transfusion volume and frequency in patients with β^0/β^0 genotypes
- **Toxicity profile remains consistent with single-agent busulfan conditioning, with no evidence of clonal dominance**
- **LentiGlobin VCN correlated with HbA^{T87Q} level**
- **LentiGlobin manufacturing process using transduction enhancement for ongoing and planned clinical studies**
  - Goal to increase drug product VCN and total hemoglobin production in all patients, regardless of genotype
- **Pivotal HGB-207 study launched**

*As of September 2016 data cut-off

LentiGlobin Current Status: Severe SCD

- **Results in HGB-205 subject 1204 demonstrate promise of LentiGlobin autologous gene therapy for severe SCD**
  - ~50% anti-sickling hemoglobin with sustained absence of severe sickle cell disease-related symptoms
- **Initial findings from HGB-206 confirm feasibility of autologous HSC gene therapy in severe SCD**
  - Successful bone marrow harvests and centralized drug product manufacturing
  - Safety profile consistent with procedural requirements
  - No gene therapy-related AEs
  - HbA^{T87Q} production in all treated patients
- **Changes implemented in protocol and manufacturing with goal of achieving higher levels of anti-sickling hemoglobin to optimize clinical benefit**

Data as of Sept 9, 2016 [HGB-205] and Nov 9, 2016 [HGB-206]

Lenti-D Current Status

- **Initial interim Starbeam results suggest early treatment with Lenti-D gene therapy may halt neuro-inflammation and demyelination in most CALD patients, with promising safety**
  - All subjects were free of Major Functional Disabilities (MFD) as of March 31, 2016 data cut-off
  - Stabilization of NFS achieved in 94% (16/17) and Loes score achieved in 82% (14/17)
  - Resolution of gadolinium enhancement by month 6 in 94% (16/17)
  - Re-appearance of diffuse gadolinium enhancement in 5 subjects, resolved in those (n=2) who have later follow-up
- **No deaths, graft failure, or GvHD reported as of March 31, 2016**
- **AE profile consistent with myeloablative conditioning with bulsulfan and cyclophosphamide**
- **Lenti-D gene therapy may offer an alternative to allogeneic bone marrow transplant, particularly for patients with no matched sibling donor**
  - Additional follow-up is needed to fully assess efficacy, durability of effect and long-term safety
  - Eight additional patients to be enrolled: same enrollment criteria
    - Gain experience manufacturing and delivering Lenti-D in Europe
    - Bolster data package for US and EU regulatory filings

Data presented at AAN 2016. Data as of March 31, 2016

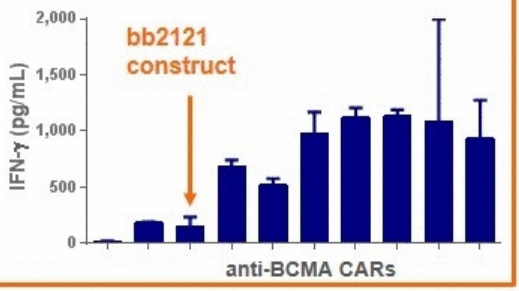

bluebirdbio®
Multiple Myeloma
Nasdaq : BLUE

bb2121: Anti-BCMA Chimeric Antigen Receptor T Cell Product Candidate

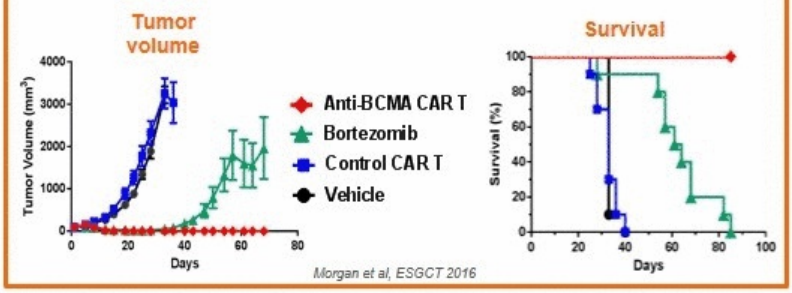
anti-BCMA CAR design

- Autologous T cells transduced with a lentiviral vector encoding a novel anti-BCMA CAR
- 4-1BB co-signaling motif selected to promote proliferation and persistence
- Construct demonstrated potent preclinical *in vivo* activity with low tonic signaling

bb2121 demonstrates low antigen-independent signaling



bb2121 improves survival and drives tumor clearance in MM mice



Morgan et al, ESGCT 2016

CRB-401 Phase 1 Study in Relapsed / Refractory Multiple Myeloma

CRB-401 Open-label Phase 1 Clinical Study of bb2121

- Objectives: Determine preliminary safety and efficacy and recommended phase 2 dose
- N = 50 patients, standard 3+3 dose escalation + expansion cohort
- Eligibility
  - Relapsed / refractory MM with ≥ 3 prior lines of therapy (including PI and IMiD), or double refractory
  - Measurable disease
  - ≥ 50% BCMA expression
  - Adequate bone marrow, renal and hepatic function

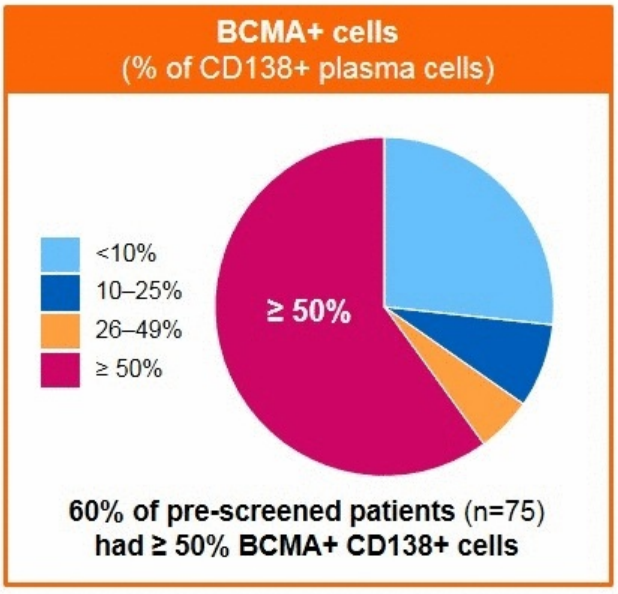
3 + 3 Dose Escalation of CAR + T Cells

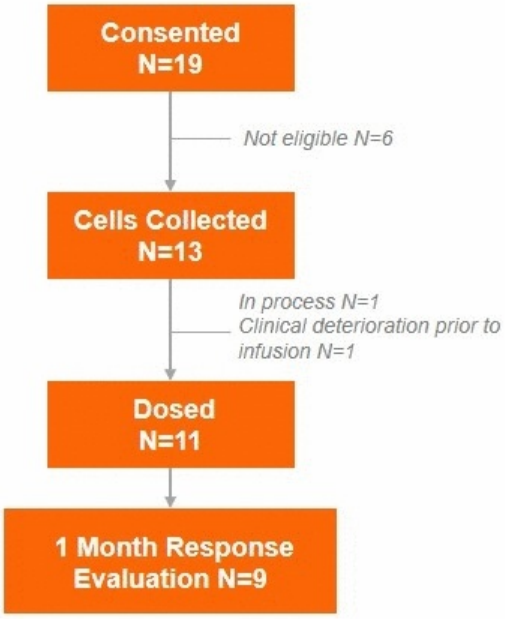
5×10^7 → 15×10^7 → 45×10^7 → 80×10^7 → 120×10^7

Up to 5 dose cohorts planned, fixed dose of CAR + T Cells

9 U.S. Clinical Sites, 1 Centralized Manufacturing Site

Study Status as of November 18, 2016





Data as of Nov 18, 2016

Demographics and Disease History in Treated Patients

Demographics and MM Staging

Parameter	Statistic	N=11 Dosed Patients
Age *years*	Median (range)	**58 (41-74)**
Male gender	N (%)	**7 (64%)**
Time since diagnosis *years*	Median (range)	**5 (1-9)**
ECOG[1] = 0	N (%)	**6 (55%)**
ISS[2] Stage		
I	N (%)	**5 (45%)**
II		**4 (36%)**
III		**2 (18%)**
High-risk cytogenetics (del17p, t(4;14), t(14;16), 1q, del 13)	N (%)	**5 (45%)**

MM Treatment History

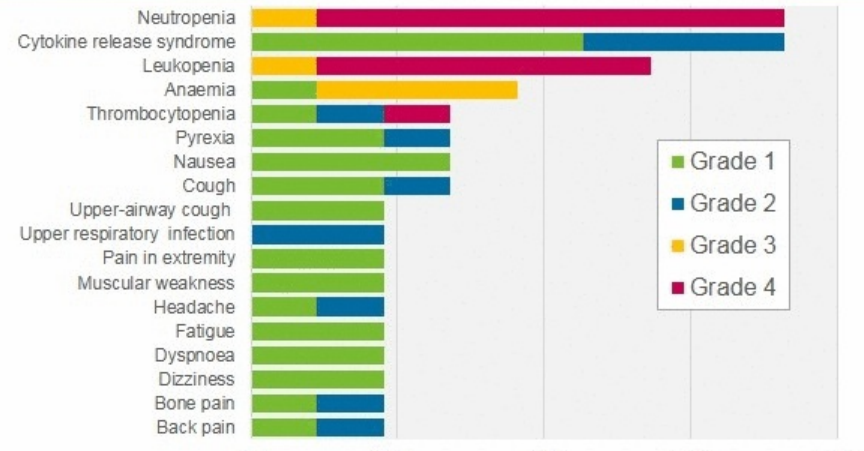
Parameter	Statistic	N=11 Dosed Patients
Prior lines of therapy	Median (range)	**6 (5-13)**
Prior autologous SCT	N (%)	**11 (100%)**
Prior therapies	N (%)	
IMiD		**11 (100%)**
lenalidomide		11 (100%)
pomalidomide		9 (82%)
proteasome inhibitor		**11 (100%)**
bortezomib		11 (100%)
carfilzomib		9 (82%)
daratumumab / CD38 antibody		**7 (64%)**

Data as of Nov 18 2016

1. Eastern Cooperative Oncology Group Performance Score. 2. International Staging System

Adverse Events Generally Mild, No ≥ Grade 3 CRS* or Neurotoxicity

Treatment Emergent Adverse Events Occurring in >1 Patient
(N = 11 Patients Dosed with bb2121)

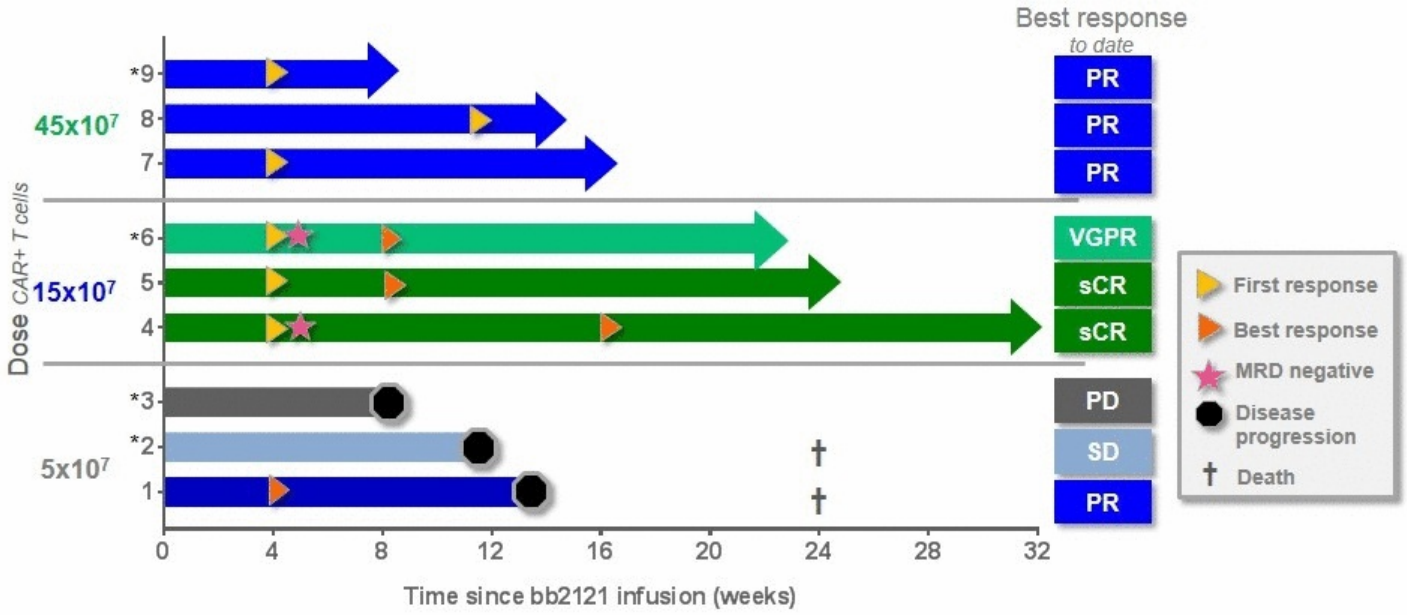


- No dose-limiting toxicities as of data cut-off
- Cytopenias related to fludarabine/ cyclophosphamide lymphodepletion, as expected
- No ≥ Grade 3 cytokine release syndrome or neurotoxicity as of data cut-off

*CRS uniformly graded according to Lee et al., *Blood* 2014;124:188-195

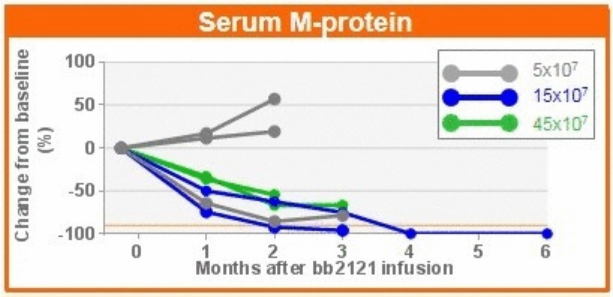
Data as of Nov 18, 2016

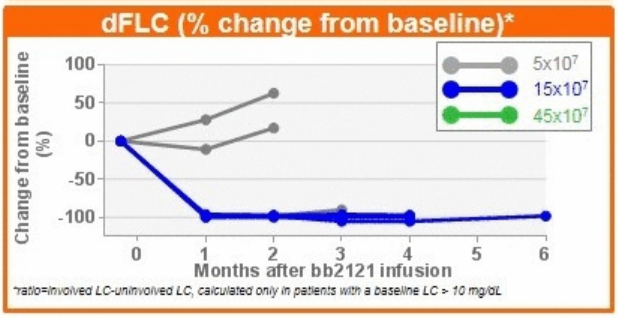
Best Response and Time Since bb2121 Infusion

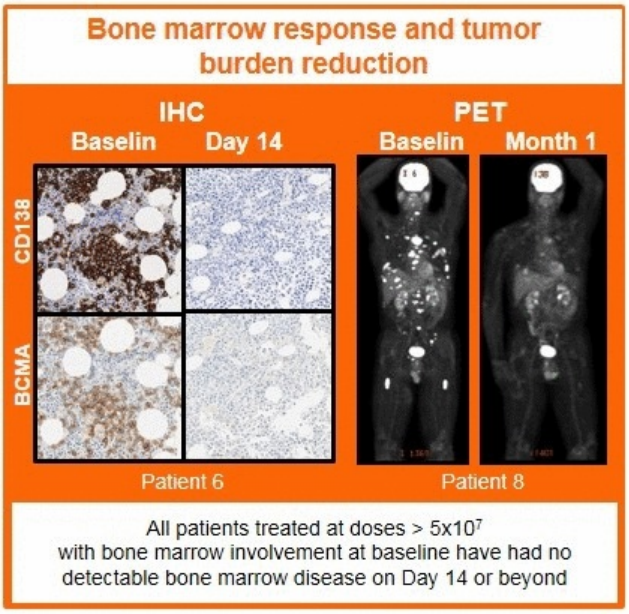


Data as of Nov 18, 2016
* Patient with ≥50% bone marrow involvement

Responses to bb2121 Infusion







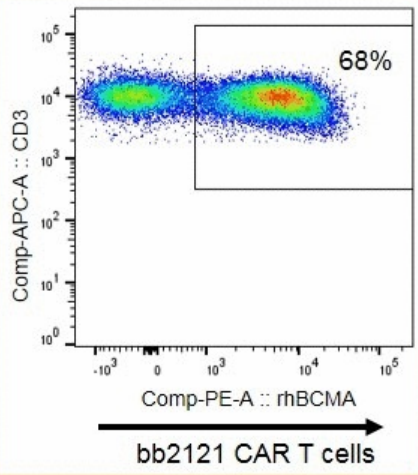
Data as of Nov 18, 2016

CAR T Cell Expansion at Every Dose

Vector Copies in CD3-enriched Peripheral Blood *by PCR*

Decrease in Serum BCMA Correlated with CAR T Expansion

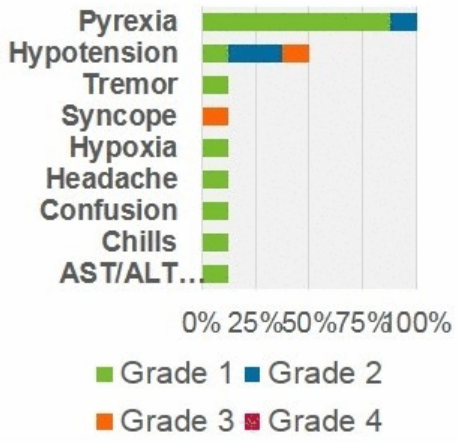
CAR+ T cells in Bone Marrow @ D14 *by FLOW*



Data as of Nov 18, 2016

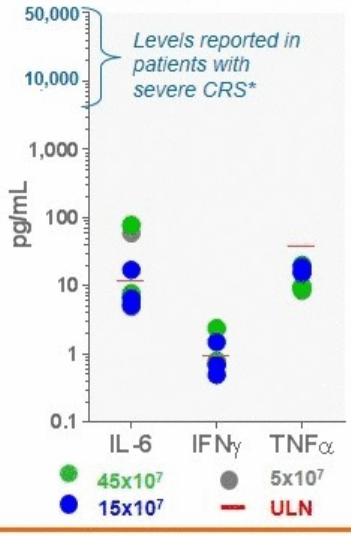
Cytokine Release Syndrome Summary

Reported CRS-Related Symptoms
In 8 treated patients with CRS

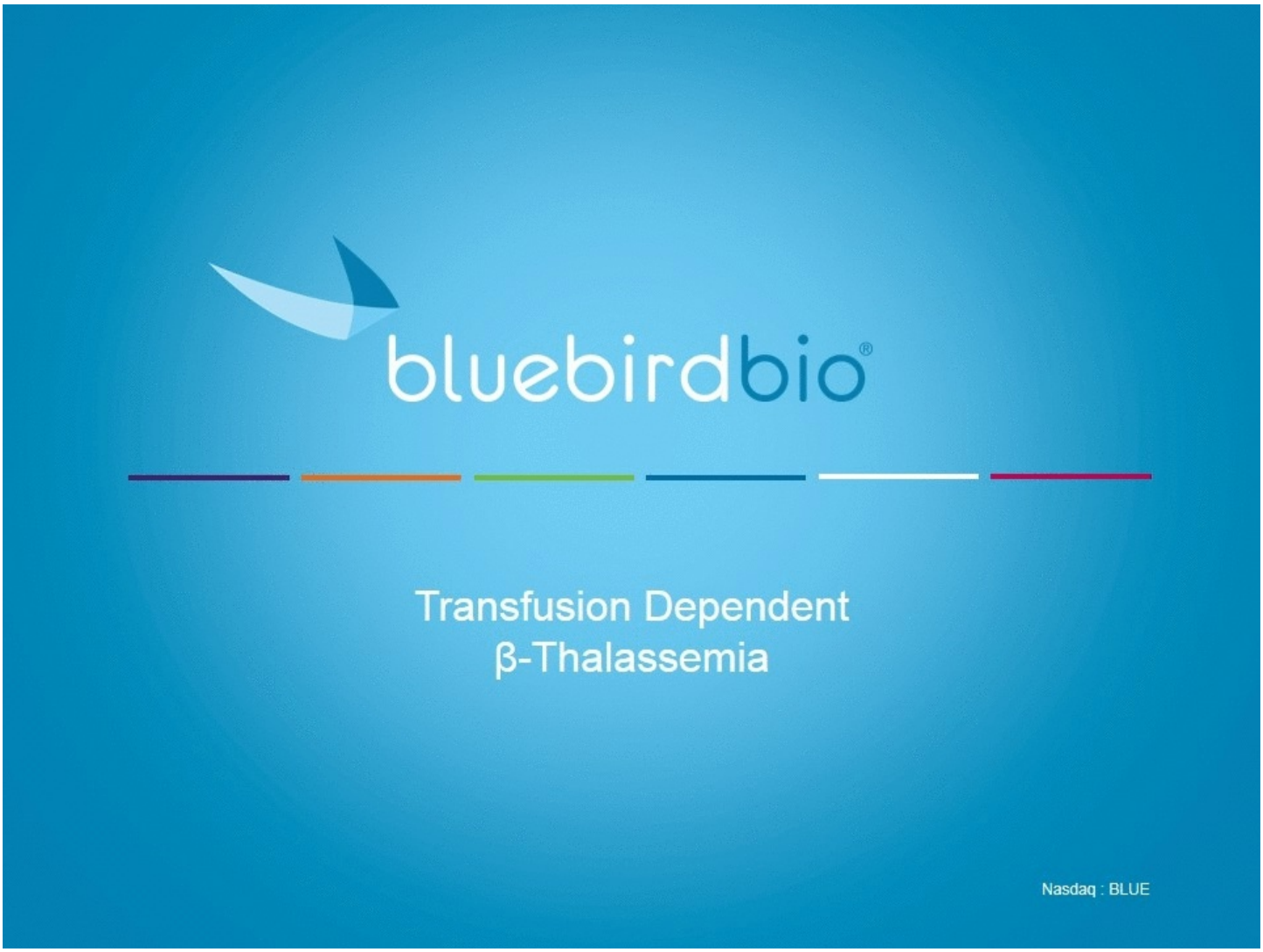


- 8/11 (73%) with cytokine release syndrome (CRS)
  - CRS severity Grades 1 & 2
  - Including patients in all dose groups and those with ≥50% bone marrow involvement
- CRS-related symptoms mostly Grade 1
- No patients received tocilizumab or steroids

Peak Cytokine Levels



Data as of Nov 18, 2016
* In anti-BCMA and anti-CD19 CAR T studies. Ali et al., *Blood* 2016 128: 1688. Maude et al., NEJM 2014


bluebirdbio®
Transfusion Dependent
β-Thalassemia
Nasdaq : BLUE

TDT Studies: Status

HGB-204
multicenter study of LentiGlobin in TDT

CURRENT STATUS

All 18 patients treated, with ≥ 6 months follow-up

2 patients have completed 2-year analysis

HGB-205
single center study of LentiGlobin in TDT and severe SCD

CURRENT STATUS

4 TDT patients treated, with 11 – 33 months follow-up

Data as of Sept 16, 2016

Patient and Drug Product Characteristics HGB-204

N=18 treated patients

	Genotype	
	β^0/β^0 (n=8)	Non-β^0/β^0 (n=10)
Genotype	8	10
β^E/β^0	--	6
Other (β^+/β^0, β^+/β^+, β^x/β^0)	--	4
Age at start of regular transfusions **Age at consent** *Median (range) years*	0 (0 – 7) 23 (12 - 35)	6 (0 – 26) 19.5 (16 – 34)
Median (range) pre-study pRBC transfusion vol *annualized median (range) mL/kg/year*	184.9 (128.7 - 261.3)	146.3 (117.0 – 234.5)
Splenectomy	3	3
Drug Product Parameters	Median (range)	
Drug product VCN[1]	0.7 (range 0.3 - 1.5)	0.8 (range 0.3 - 1.1)
Drug product cell dose *CD34+ cells x10^6/kg*	11.0 (range 6.1-18.1)	7.1 (range 5.2-13.0)

Data as of Sept 16, 2016

1. VCN: vector copy number (vector copies per diploid genome)

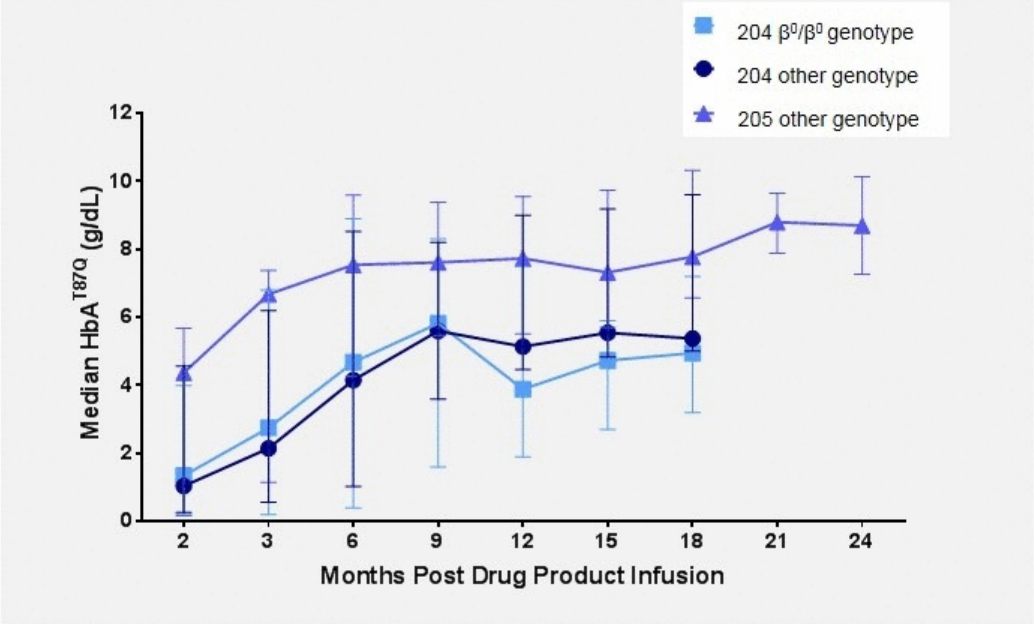
Patient and Drug Product Characteristics HGB-205

	1201	1202	1203	1206
Age at Enrollment (years)	18	16	19	17
Genotype	β^0/β^E	β^0/β^E	homozygous IVS1 nt 110 G>A	β^0/β^E
Pre-Treatment pRBC Transfusions (mL/kg/year)[1]	139	188	176	197
VCN in Drug Product[2]	1.5	2.1	0.8	1.1
CD34+ Cell Dose ($x10^6$/kg)	8.9	13.6	8.8	12.0
Busulfan AUC (average, uM/min)	4,967	5,212	4,670	4,930
Follow-up (months)	**33.5**	**30.3**	**14.6**	**11.6**

[1]mean pRBC requirement per year, over the past 2 years prior to consent; [2]VCN = number of vector copies per diploid genome

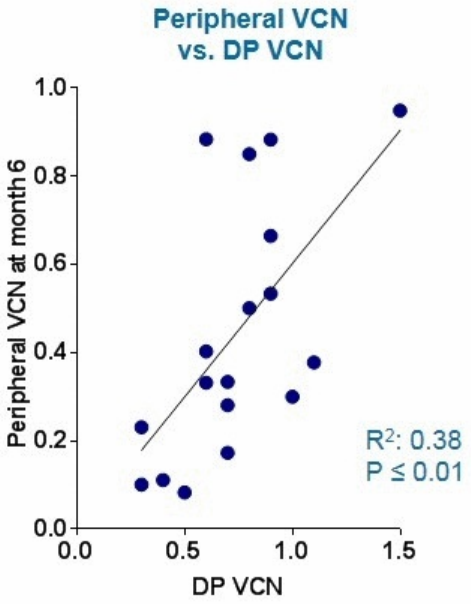
Data as of Sept 16, 2016

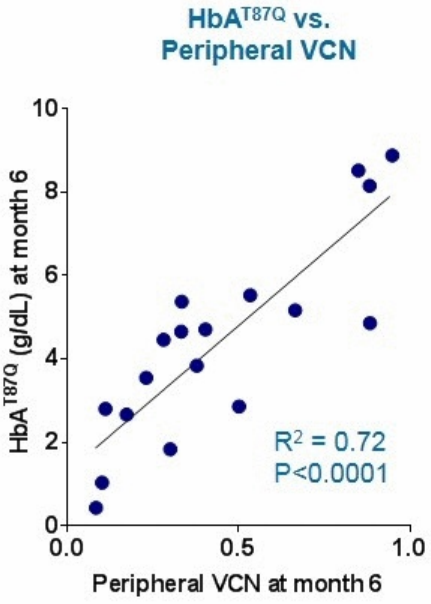
HbA^{T87Q} production increases to month 9, then stabilizes



Data as of Sept 9, 2016 [HGB-205], Sept 16, 2016 [HGB-204]

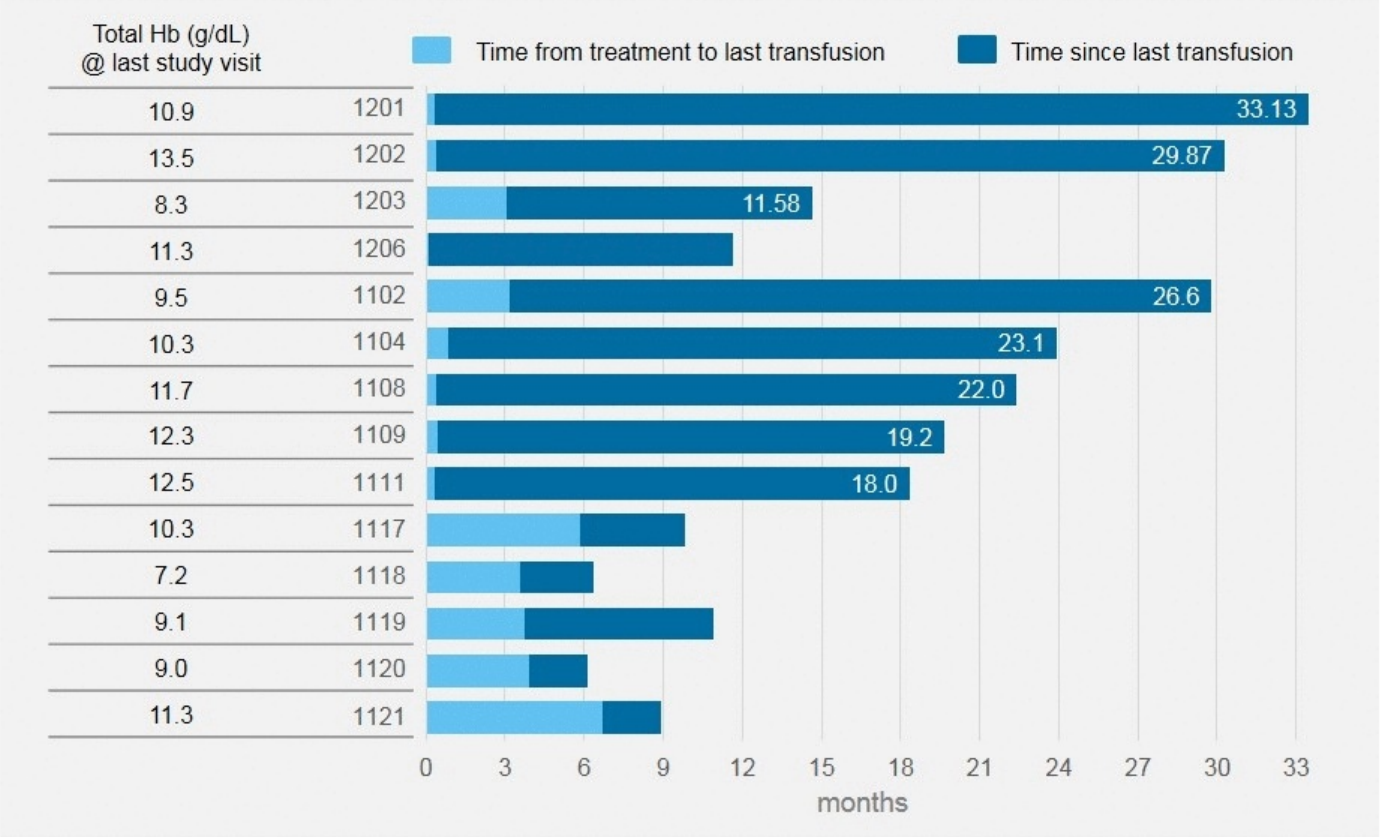
Peripheral VCN correlates with DP VCN and HbA^{T87Q} level at Month 6





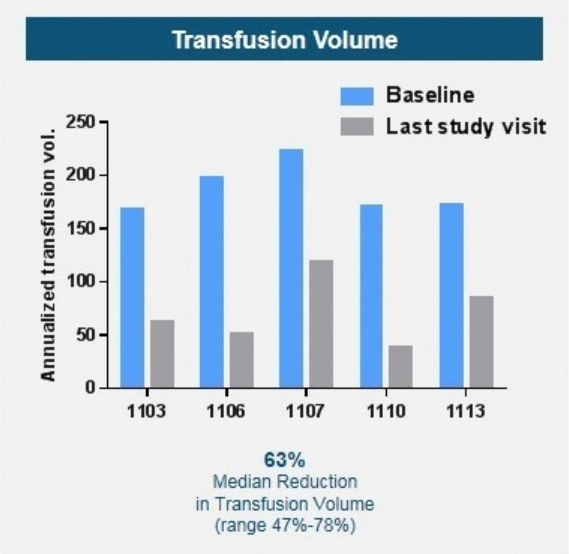
Data as of Sept 16, 2016

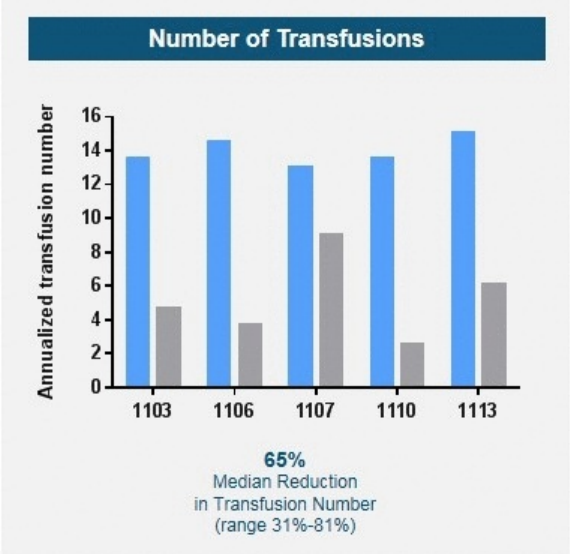
Patients with non-β^0/β^0 genotypes and ≥12 months follow-up have stopped RBC transfusions



Data as of Sept 9, 2016 [HGB-205], Sept 16, 2016 [HGB-204]

Transfusion reduction seen in patients with β^0/β^0 genotypes with ≥12 months follow-up



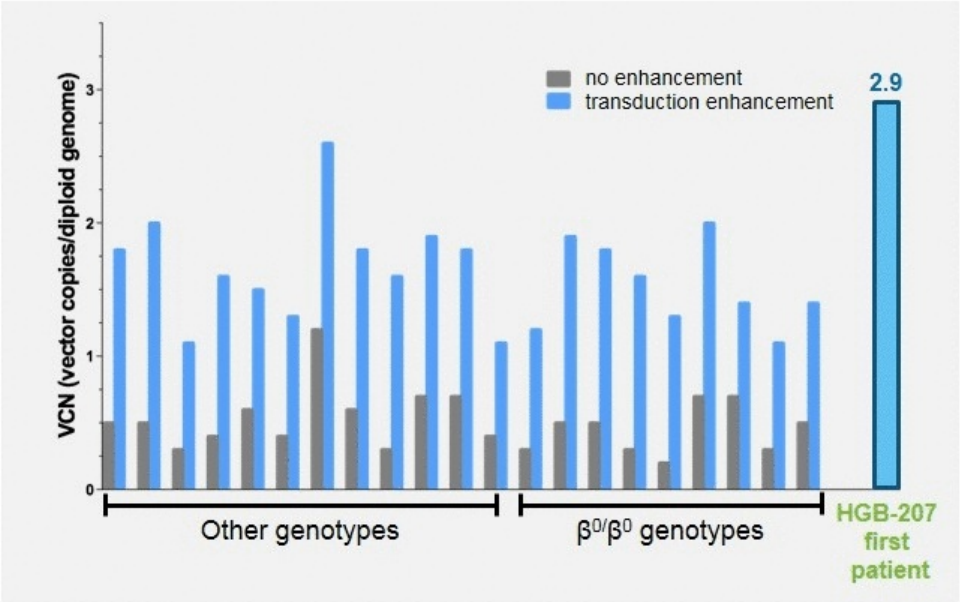


Post-treatment: annualized on-study volume and number of transfusions based on observed values starting at month 6 through data cut-off

Median follow-up for patients with β^0/β^0 genotypes (N=8) 17.3 months (range 6.7-25.4)

Data as of Sept 16, 2016

Research-scale Results Demonstrate Increase in Drug Product VCN Across Genotypes



Percent of cells transduced: 77%

Data as of Nov 30, 2016
Exploratory *in vitro* analysis conducted at research scale

Next steps: Pivotal clinical studies of LentiGlobin therapy in TDT

NORTHSTAR-2 STUDY

HGB-207

Non-β^0/β^0 genotypes

Phase 3, multi-center, global study

- N=15 adults and adolescents, and N=8 pediatric patients
- **Open and enrolling**

NORTHSTAR-3 STUDY

HGB-212

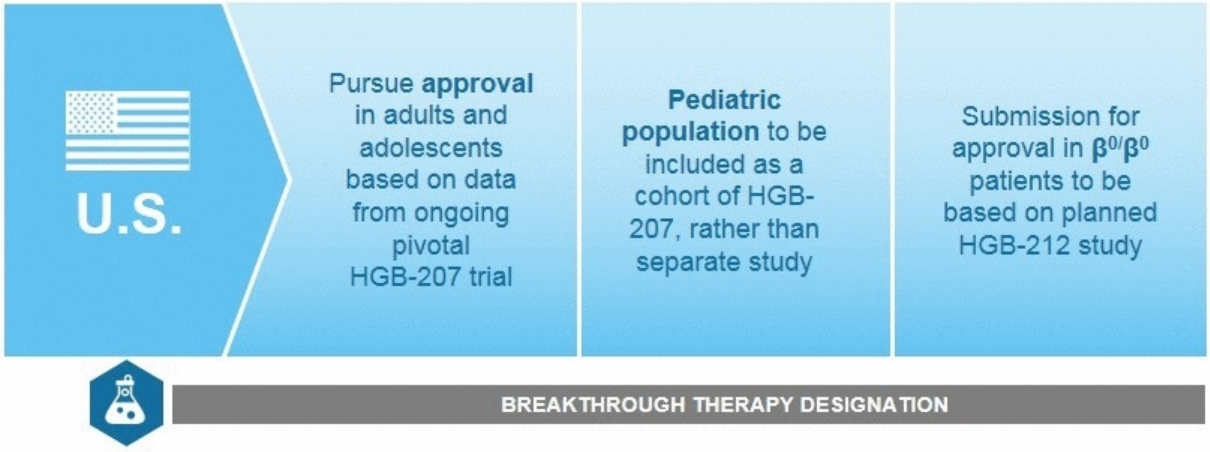
β^0/β^0 genotypes

Phase 3, multi-center, global study

- N=15 adults, adolescents and pediatric patients
- **Initiation planned for 2017**

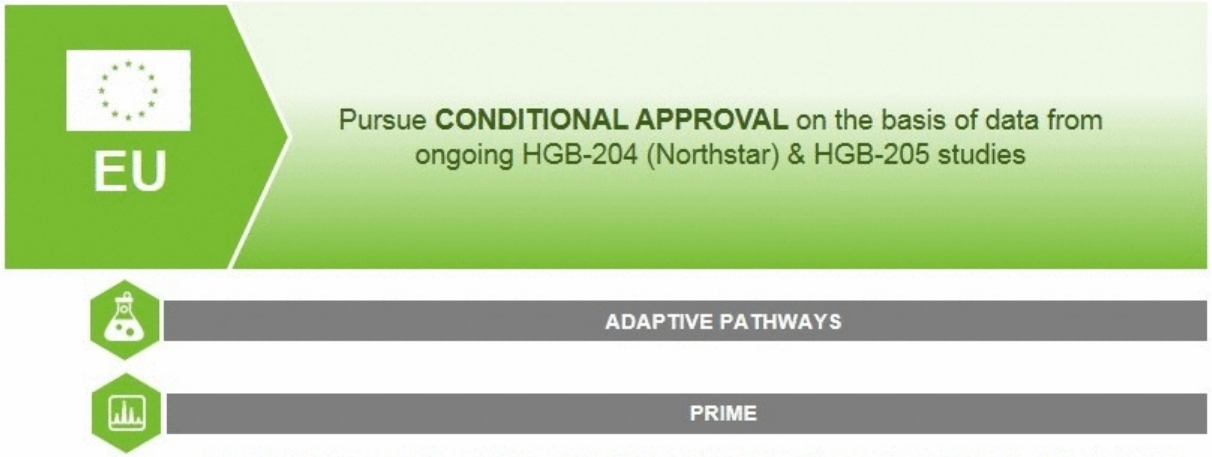
U.S. Registration Strategy

General agreement with U.S. regulators on the registration path for LentiGlobin BB305 for the treatment of transfusion-dependent β-thalassemia

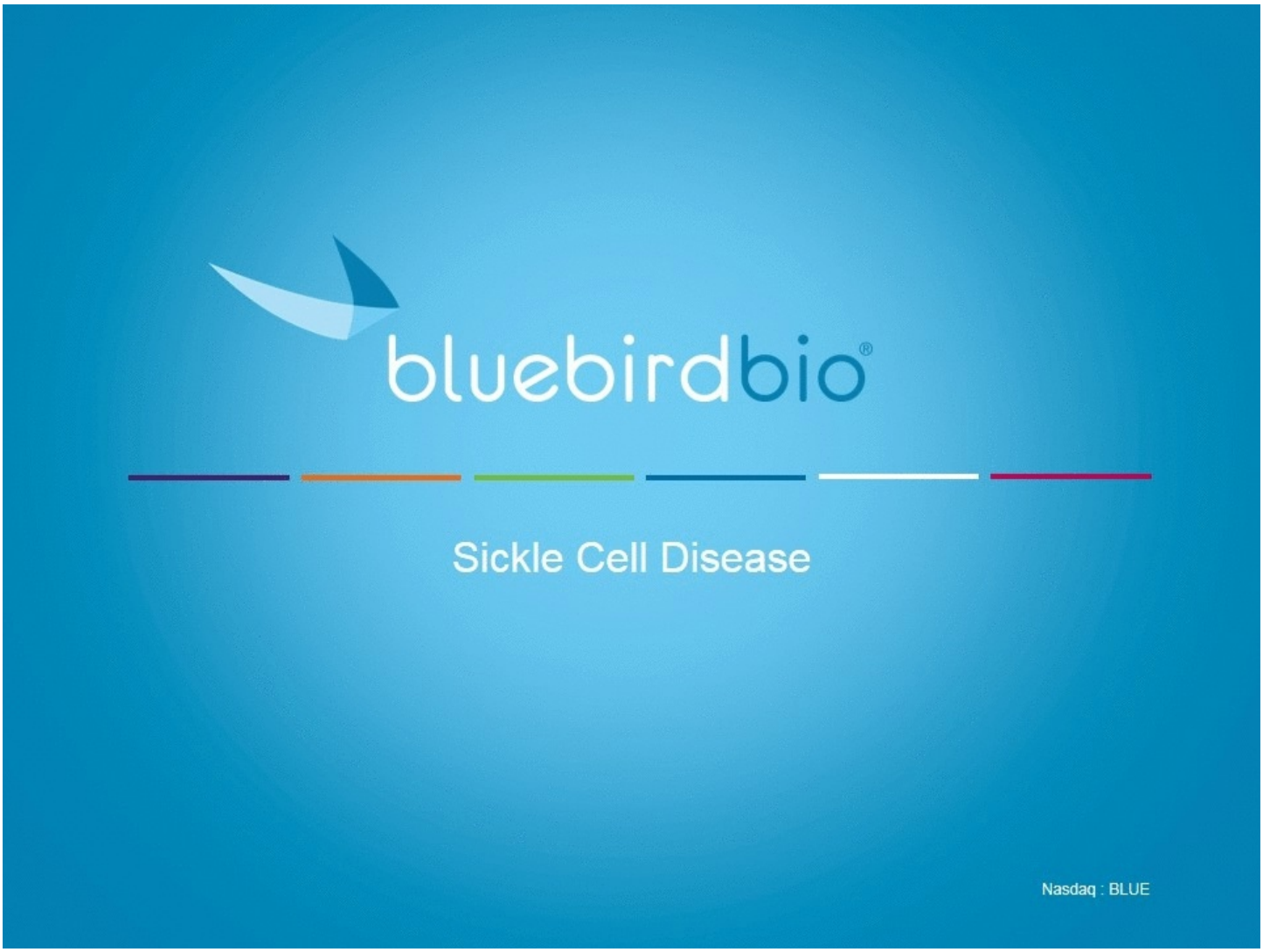


EU Registration Strategy

General agreement with EU regulators on the registration path for LentiGlobin BB305 for the treatment of transfusion-dependent β-thalassemia



Plan to include available data from HGB-207 and HGB-212 studies at the time of filing in the marketing authorization application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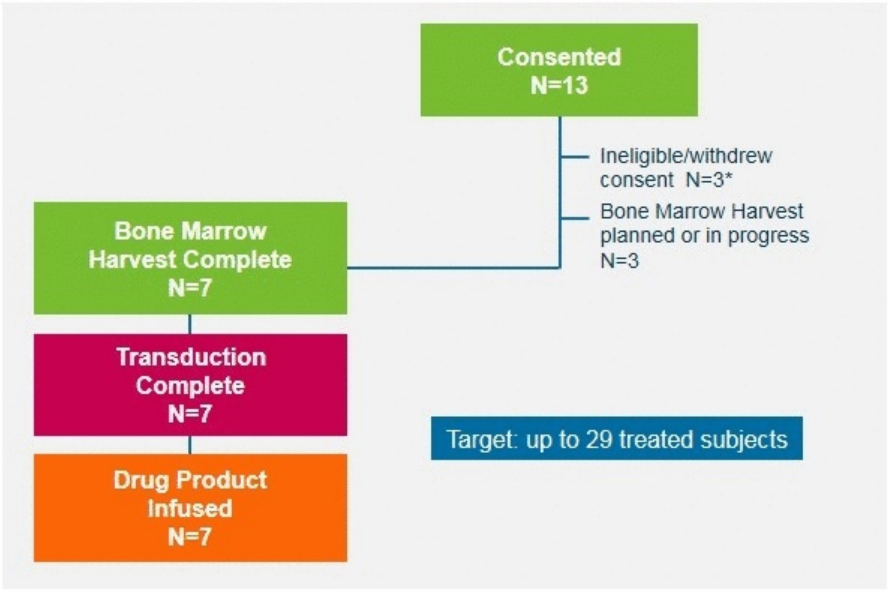
Sickle Cell Disease
Nasdaq : BLUE

Current Status of HGB-206 Study



Enrollment criteria

- 18+ years of age
- History of symptomatic SCD
- Adequate organ function/performance status
- No previous HSCT or gene therapy

Data as of Nov 9, 2016
* 2 screen failures (bilirubin levels/fertility concerns), 1 withdrew consent

Patient and Treatment Characteristics

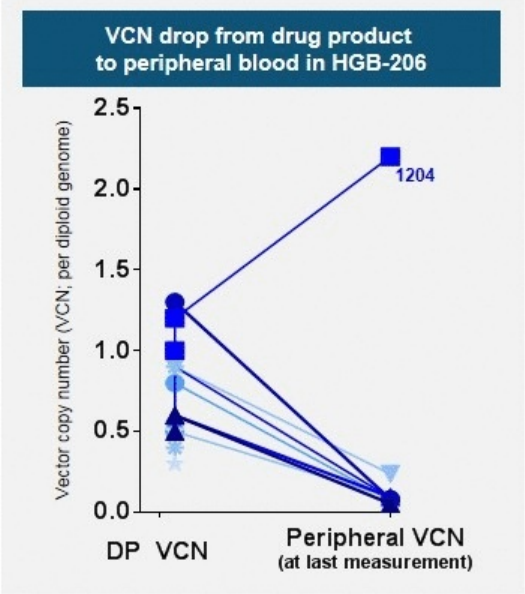
All treated patients (n=8) have a **history of severe SCD** in 2 years prior to enrollment, despite hydroxyurea therapy

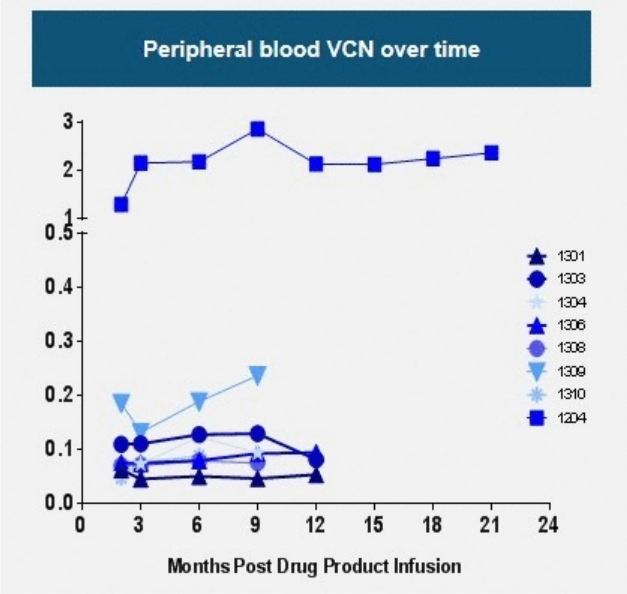
SCD History (n=8)			
Recurrent VOCs	*Stroke*	*Acute Chest Syndrome*	*Regular pRBC Transfusions*
6	2	6	2

Treatment Characteristics		
Parameter	**HGB-206** (n=7) *Median (range)*	**HGB-205** (n=1)
Age at Enrollment (years)	26 (18 – 42)	13
Bone Marrow Harvests	2 (1 – 4)	2
Target daily busulfan AUC (µM/min)	5000 (4400 – 5400)	4841 (actual)
LentiGlobin DP cell dose (CD34+x10^6 cells/kg)	2.1 (1.6 – 5.1)	5.6
LentiGlobin DP vector copy number (VCN)	0.6 (0.3 – 1.3)	1.0, 1.2

Data as of Sept 9, 2016 [HGB-205] and Nov 9, 2016 [HGB-206]

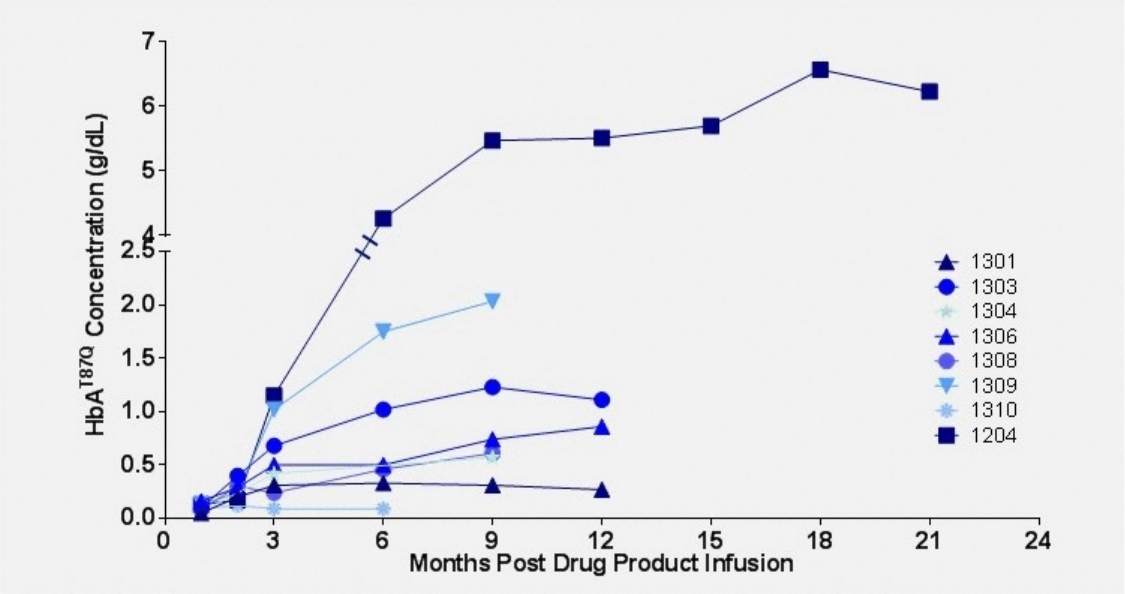
Vector Copy Number (VCN) in Drug Product and Peripheral Blood





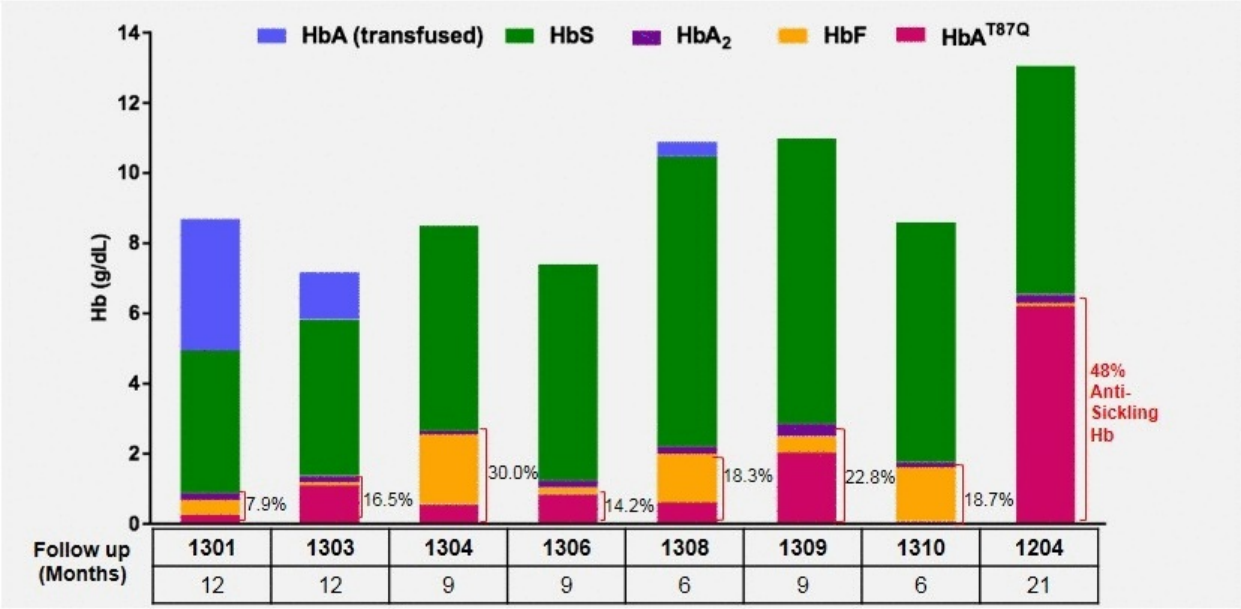
Data as of Sept 9, 2016 [HGB-205] and Nov 9, 2016 [HGB-206]

All Treated Patients Produce Measurable HbA^{T87Q}



Data as of Sept 9, 2016 [HGB-205] and Nov 9, 2016 [HGB-206]

8% to 48% Anti-Sickling Hemoglobin at Last Follow Up



Follow up (Months)	1301	1303	1304	1306	1308	1309	1310	1204
	12	12	9	9	6	9	6	21

Data as of Sept 9, 2016 [HGB-205] and Nov 9, 2016 [HGB-206]

Clinical Outcomes 21 Months After Treatment in HGB-205 Patient 1204

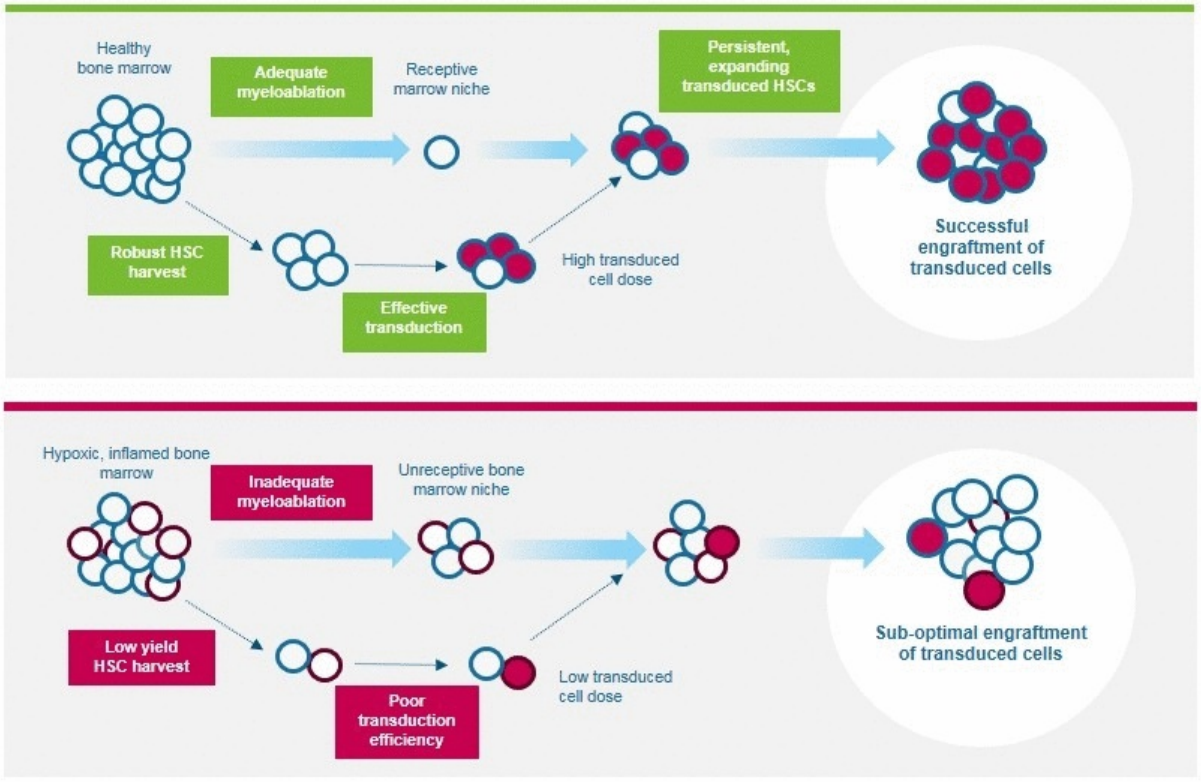
Data as of Nov 9, 2016 [HGB-206]

Interim Summary – Where are we today?

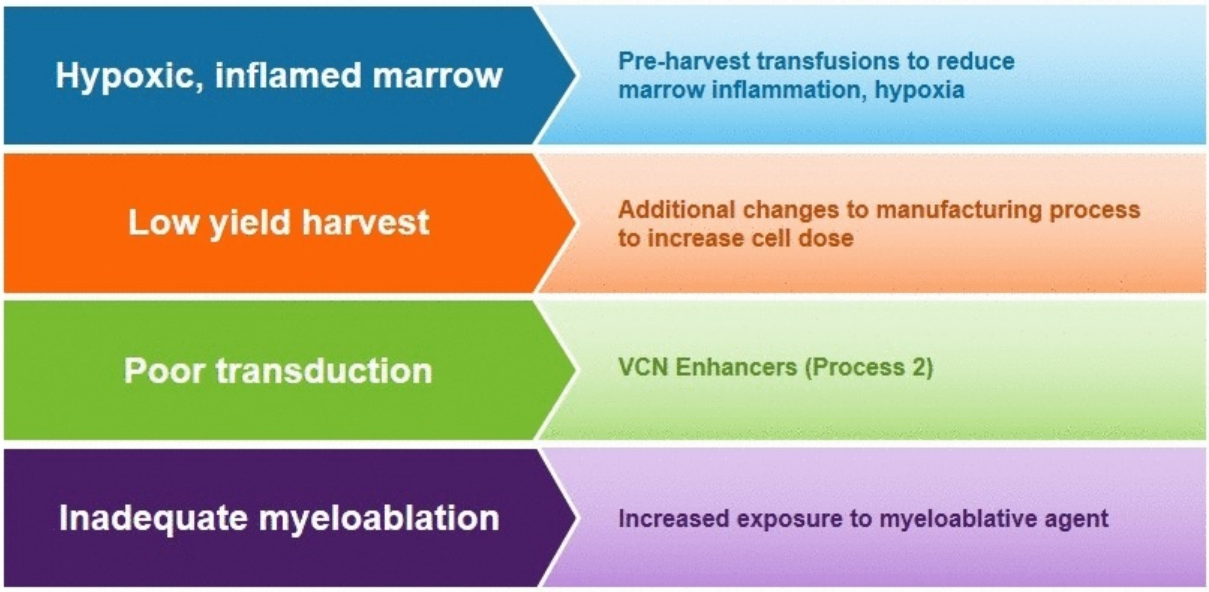
- **Results in HGB-205 subject 1204 demonstrate promise of LentiGlobin autologous gene therapy for severe SCD**
  - ~50% anti-sickling hemoglobin with sustained absence of severe sickle cell disease-related symptoms
- **Initial findings from HGB-206 confirm feasibility of autologous HSC gene therapy in severe SCD**
  - Successful bone marrow harvests and centralized drug product manufacturing
  - Safety profile consistent with procedural requirements
  - No gene therapy-related AEs
  - HbA^{T87Q} production in all treated patients
- **Challenges remain to achieve target level of anti-sickling hemoglobin in all patients**
- **Higher levels of anti-sickling hemoglobin are needed to optimize clinical benefit**

Data as of Sept 9, 2016 [HGB-205] and Nov 9, 2016 [HGB-206]

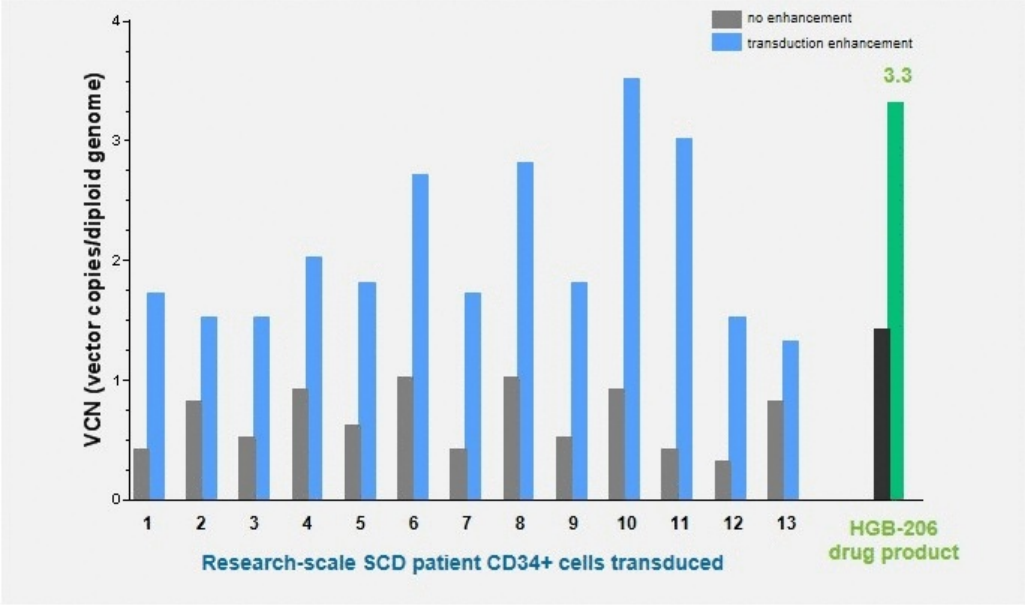
Stem Cell Transduction and Engraftment – The Challenge of Sickle Cell Disease



Protocol and Process Changes to Potentially Improve Outcomes in SCD Patients



LentiGlobin Manufacturing Process with Transduction Enhancers Increases DP VCN in SCD CD34+ Cells



Percent of cells transduced: 83%

Data as of Nov 30, 2016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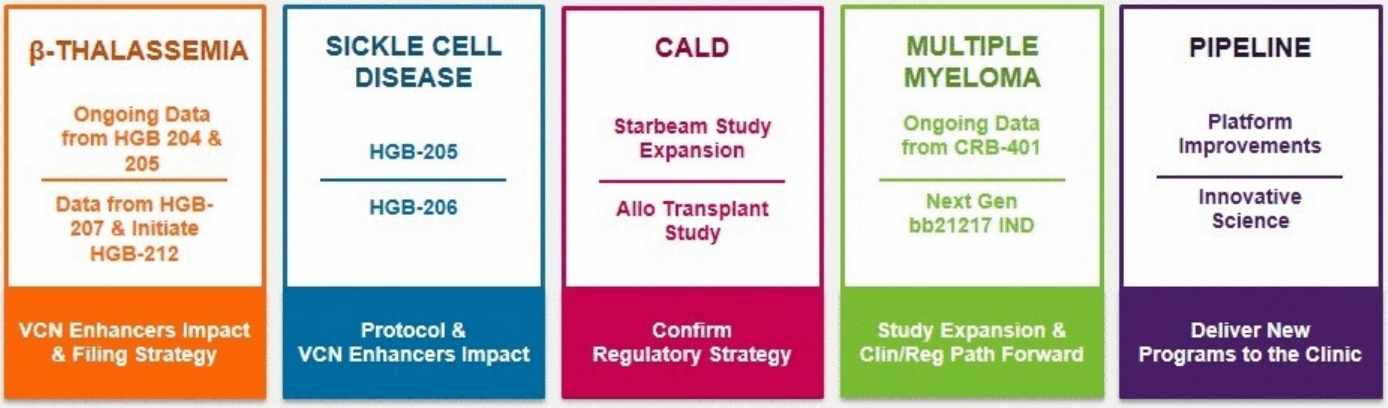
Nasdaq : BLUE

The 2017 Plan is Clear and Catalyst Rich



$885 million cash and investments as of 12/31/16 (unaudited)

Cash runway into 2H19

2022 Vision – The Gene Therapy Product Platform

∞ | Patient Impact

2+ Products on the Market	2+ Programs Nearing Commercialization	4+ Additional Programs in the Clinic

Bringing & Valuing Hope

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Nick Leschly, chief bluebird
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