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): November 30, 2016

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 7.01 Regulation FD Disclosure

On December 1, 2016, bluebird bio, Inc. ("bluebird") will be conducting an investor webcast summarizing clinical data from its anti-BCMA CAR T cell therapy, being presented at the EORTC-NCI-AACR Molecular Targets and Cancer Therapies Symposium on December 1, 2016. A copy of the presentation is being furnished as Exhibit 99.2 to this Report on Form 8-K. The information in Item 7.01 of this Report on Form 8-K and Exhibit 99.2 attached hereto is intended to be furnished and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934 (the "Exchange Act') or otherwise subject to the liabilities of that section, nor shall it be deemed incorporated by reference in any filing under the Securities Act of 1933 or the Exchange Act, except as expressly set forth by specific reference in such filing.

Item 8.01 Other Events

On November 30, 2016, bluebird bio, Inc. issued a press release announcing clinical data from its anti-BCMA CAR T cell therapy, being presented at the EORTC-NCI-AACR Molecular Targets and Cancer Therapies Symposium on December 1, 2016. The full text of the press release regarding the announcement is filed as Exhibit 99.1 to this Current Report on Form 8-K and is incorporated herein by reference.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
99.1	Press release issued by bluebird bio, Inc. on November 30, 2016
99.2	Investor presentation provided by bluebird bio, Inc. on December 1, 2016

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: December 1, 2016

bluebird bio, Inc.

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

EXHIBIT INDEX

Exhibit No.	Description
99.1	Press release issued by bluebird bio, Inc. on November 30, 2016
99.2	Investor presentation provided by bluebird bio, Inc. on December 1, 2016

Exhibit 99.1

bluebird bio Announces Interim Phase 1 Dose Escalation Data for its Anti-BCMA CAR T Product Candidate in Patients with Relapsed/Refractory Multiple Myeloma

-100% of patients (n=6) in second and third dose cohorts achieved an objective response; two patients MRD-negative; overall response rate (ORR) is 78% –
-Two patients achieved stringent complete responses, with 6 and 4 months follow-up –
-Among all dosed patients (n=11), no dose-limiting toxicities to date, no Grade 3 or Grade 4 cytokine release syndrome or Grade 3 or Grade 4 neurotoxicity observed –
-Company to hold conference call and webcast with slides at 8:00 am ET on Thursday, December 1st –

CAMBRIDGE, Mass., November 30, 2016 – bluebird bio, Inc. (Nasdaq: BLUE), a clinical-stage company committed to developing potentially transformative gene therapies for severe genetic diseases and T cell-based immunotherapies for cancer, announced that interim data from its ongoing Phase 1 clinical study of bb2121, the company's investigational anti-BCMA CAR T cell product candidate in patients with relapsed/refractory multiple myeloma, will be presented on Thursday, December 1, 2016 at the 28th EORTC-NCI-AACR Molecular Targets and Cancer Therapeutics Symposium in Munich, Germany. bluebird bio is developing bb2121 in collaboration with Celgene Corporation.

"We are pleased that these early data from our ongoing Phase 1 study of bb2121 demonstrate objective anti-tumor responses in heavily pre-treated patients with multiple myeloma, with all patients in the 15.0 x 10^7 and 45.0 x 10^7 CAR+ T cell dose cohorts achieving responses, including among them, patients with stringent complete responses and elimination of minimal residual disease," said David Davidson, M.D., chief medical officer, bluebird bio. "We are also encouraged by the safety profile to date, particularly the lack of severe cytokine release syndrome or neurotoxicity. In light of these positive data, and thanks to the multiple participating clinical sites and centralized manufacturing infrastructure we and our partner Celgene have built for this program, we anticipate efficiently completing the dose escalation stage of the trial and initiating the expansion cohort."

Clinical remissions and limited toxicity in a first-in-human multicenter study of bb2121, a novel anti-BCMA CAR T cell therapy for relapsed/refractory multiple myeloma (Abstract #14, LBA)

Presenter: Yi Lin, M.D., Ph.D., Assistant Professor of Medicine and Oncology, Mayo Clinic Division of Hematology, Rochester, MN
Date: Thursday, December 1, 2016, 18:00 CET (12:00 pm ET)
Session: Plenary Session 7

The open-label Phase 1 CRB-401 study (NCT02658929) is investigating the administration of bb2121 anti-BCMA CAR T cells in patients with relapsed and/or refractory multiple myeloma. The primary endpoint of the study is incidence of adverse events (AEs) and abnormal laboratory test results, including dose-limiting toxicities (DLTs). The study also seeks to assess disease-specific response criteria including: complete response (CR), very good partial response (VGPR), and partial response (PR) according to the International Myeloma Working Group (IMWG) Uniform Response Criteria for Multiple Myeloma. The study also seeks to determine the recommended dose for further clinical trials. Patients on study were heavily pre-treated, with a median of six prior therapies (range: 5 - 13). As of the November 18th, 2016 data cut-off, 11 patients had been enrolled and dosed in four dose cohorts: 5.0 x 10^7, 15.0 x 10^7, 45.0 x 10^7 and 80 x 10^7 CAR+ T cells. All 11 dosed patients were evaluable for safety, and the first nine patients (5.0 x 10^7, 15.0 x 10^7, 45.0 x 10^7 dose cohorts) have undergone their first multiple myeloma tumor restaging and were evaluable for efficacy. This study is currently enrolling patients at seven sites in the U.S., with an anticipated total enrollment of 50 patients.

Patients received a conditioning regimen of cyclophosphamide and fludarabine, followed by an infusion of bb2121 anti-BCMA CAR T cells. The CAR T cells were produced from each patient's own blood cells, which were modified using a lentiviral vector encoding the anti-BCMA CAR.

Results, as of November 18th, 2016 Data Cut-off:

Cohort	1	2	3
CAR+ T Cell dose	5.0 x 10^7	15.0 x 10^7	45.0 x 10^7
Overall Response Rate in cohort	33%	100%	100%

Best Response	PD SD PR	sCR (time to response: 2 months) sCR* (time to response: 4 months) VGPR* *Both patients with a minimal residual disease (MRD) assessment at Month 1 were MRD negative	PR PR PR
		All patients in cohorts 2 and 3 with bone marrow involvement at baseline had no detectable multiple myeloma cells in their bone marrow on Day 14 or beyond	
Median Prior Lines of Therapy	6 (range: 5-13); all patients had a prior autologous stem cell transplant, as well as prior exposure to a proteasome inhibitor and an immunomodulatory agent; 64 percent of patients had previously received daratumumab or CD38 antibody		
Safety	No dose-limiting toxicities and no Grade 3 or higher neurotoxicities or Grade 3 or higher cytokine release syndrome (CRS) have been observed. No patients received tocilizumab or steroids.		

Investor Webcast Information

bluebird bio will host a conference call to discuss these data at 8:00 a.m. ET tomorrow, December 1, 2016. The live webcast can be accessed under "Calendar of Events" in the Investors and Media section of the company's website at www.bluebirdbio.com. The webcast will be available for replay for 30 days on the company website. Alternatively, investors may listen to the call by dialing (844) 825-4408 from locations in the United States or (315) 625-3227 from outside the United States. Please refer to conference ID number 27009736.

About bluebird bio, Inc.

With its lentiviral-based gene therapies, T cell immunotherapy expertise and gene editing capabilities, bluebird bio has built an integrated product platform with broad potential application to severe genetic diseases and cancer. bluebird bio's gene therapy clinical programs include its Lenti-D™ product candidate, currently in a Phase 2/3 study, called the Starbeam Study, for the treatment of cerebral adrenoleukodystrophy, and its LentiGlobin™ BB305 product candidate, currently in four clinical studies for the treatment of transfusion-dependent β-thalassemia and severe sickle cell disease. bluebird bio's oncology pipeline is built upon the company's leadership in lentiviral gene delivery and T cell engineering, with a focus on developing novel T cell-based immunotherapies, including chimeric antigen receptor (CAR T) and T cell receptor (TCR) therapies. bluebird bio's lead oncology program, bb2121, is an anti-BCMA CAR T program partnered with Celgene. bb2121 is currently being studied in a Phase 1 trial for the treatment of relapsed/refractory multiple myeloma. bluebird bio also has discovery

research programs utilizing megaTALs/homing endonuclease gene editing technologies with the potential for use across the company's pipeline.

bluebird bio has operations in Cambridge, Massachusetts; Seattle, Washington; and Paris, France.

Forward-Looking Statements

This release contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding the Company's bb2121 product candidate to treat relapsed/refractory multiple myeloma. Any forward-looking statements are based on management's current expectations of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or implied by such forward-looking statements. These risks and uncertainties include, but are not limited to, risks that the preliminary positive results from our ongoing CRB-401 clinical trial of bb2121 will not continue or be repeated in our ongoing or planned clinical trials of bb2121, the risk of a delay in the enrollment and treatment of patients in our CRB-401 clinical study, and the risk that our bb2121 product candidate will not be successfully developed, approved or commercialized. For a discussion of other risks and uncertainties, and other important factors, any of which could cause our actual results to differ from those contained in the forward-looking statements, see the section entitled "Risk Factors" in our most recent quarterly report on Form 10-Q, as well as discussions of potential risks, uncertainties, and other important factors in our subsequent filings with the Securities and Exchange Commission. All information in this press release is as of the date of the release, and bluebird bio undertakes no duty to update this information unless required by law.

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epingpank@bluebirdbio.com
or
Pure Communications, Inc.
Dan Budwick, 973-271-6085

Exhibit 99.2

bluebirdbio®

EORTC-NCI-AACR Molecular Targets and Cancer Therapies Symposium

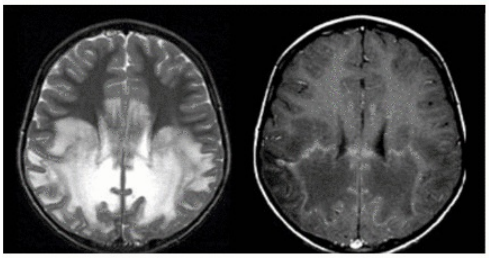
December 1, 2016

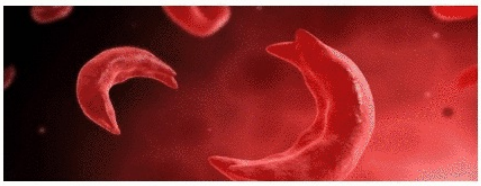
Nasdaq : BLUE

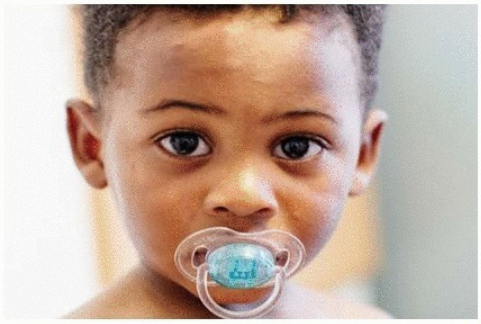
Forward Looking Statements

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.

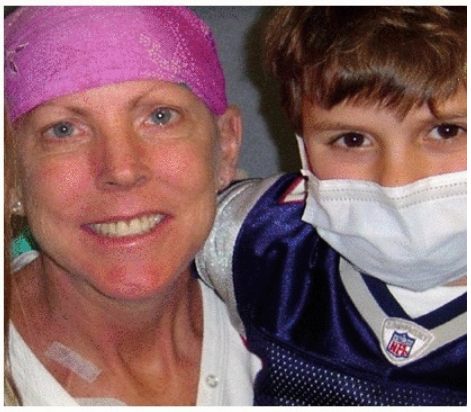
Our Vision: Make Hope a Reality

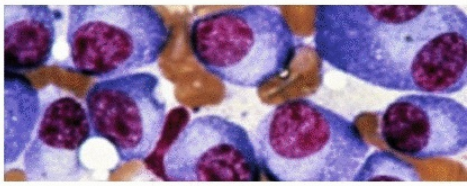




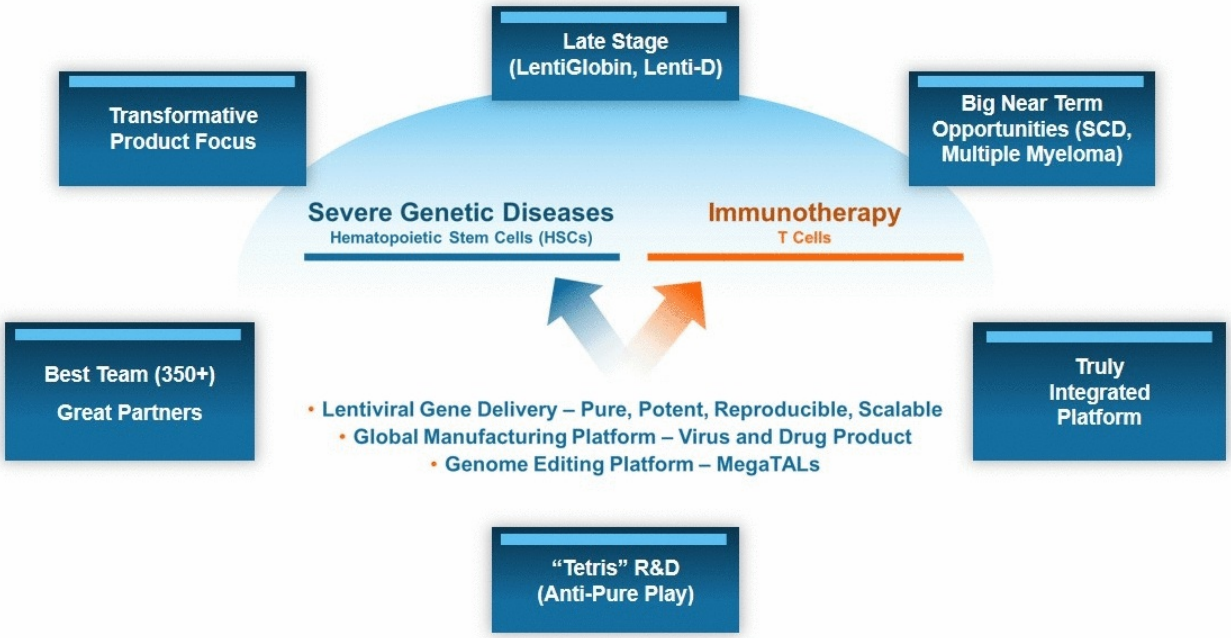


BLUE MOJO





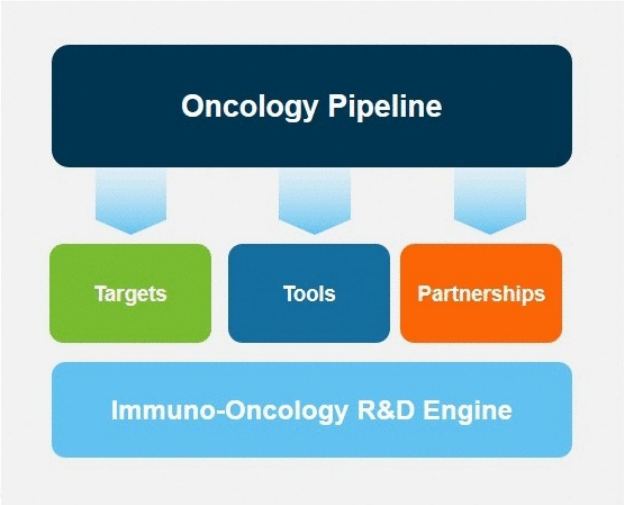
Our Strategic Intent



Building a Translational Oncology Products Company

The Right Approach for the Right Targets

- Access to targets: CARs and TCRs
- Optimization: gene editing, manufacturing enhancements; on/off switches; product and technology combinations
- Internal focus on bluebird strengths coupled with collaborations to benefit from outside strengths
- Broad and diversified pipeline



Questions For Today

- What is the bb2121 construct and how is it different?
- Are we seeing a manageable safety profile?
- Are patients responding to treatment at lower doses?
- What is the early risk-benefit profile?
- Are the responses durable?

Clinical responses with bb2121, a novel anti-BCMA CAR T cell therapy: Initial results from a Phase 1 multi-center trial in relapsed/refractory multiple myeloma

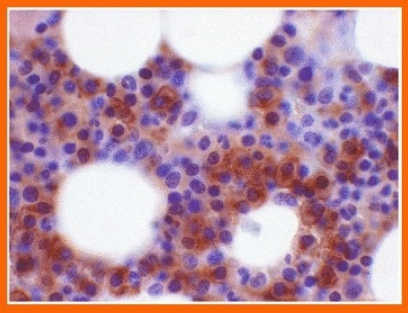
Jesus Berdeja, MD, Yi Lin, MD, PhD, Noopur Raje, MD, David Siegel, MD, PhD, Nikhil Munshi, MD, PhD, Ashley Turka, Ping Lam, M. Travis Quigley, James N. Kochenderfer, MD

EORTC NCI AACR 2016
29 NOVEMBER 2 DECEMBER 2016
EORTC The future of cancer therapy
NIH NATIONAL CANCER INSTITUTE
AACR American Association for Cancer Research

BCMA: A Promising Target in Multiple Myeloma (MM)

B cell maturation antigen (BCMA)

- A member of the TNF receptor superfamily
- Expression is largely restricted to plasma cells and mature B cells
- Not detectable in any other normal tissues
- Expressed nearly universally on multiple myeloma cells
- Anti-MM efficacy validated in initial studies[1]



Multiple myeloma cells expressing BCMA

(brown color = BCMA protein)

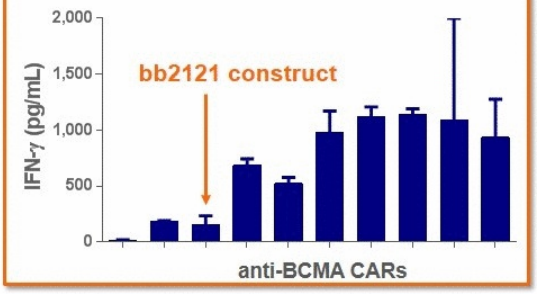
1. Ali et al., *Blood* 2016 128: 1688. Cohen et al., ASH 2016, abstract 1147

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

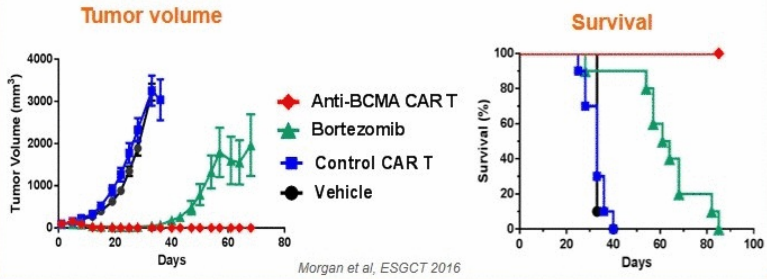
anti-BCMA CAR design

- 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

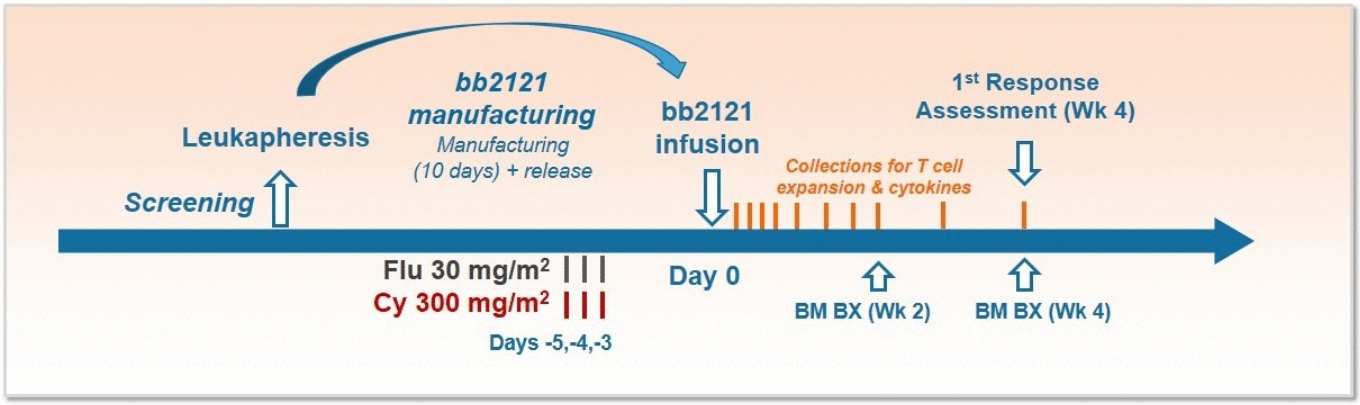
9 U.S. Clinical Sites, 1 Centralized Manufacturing Site

CRB-401 Study Design

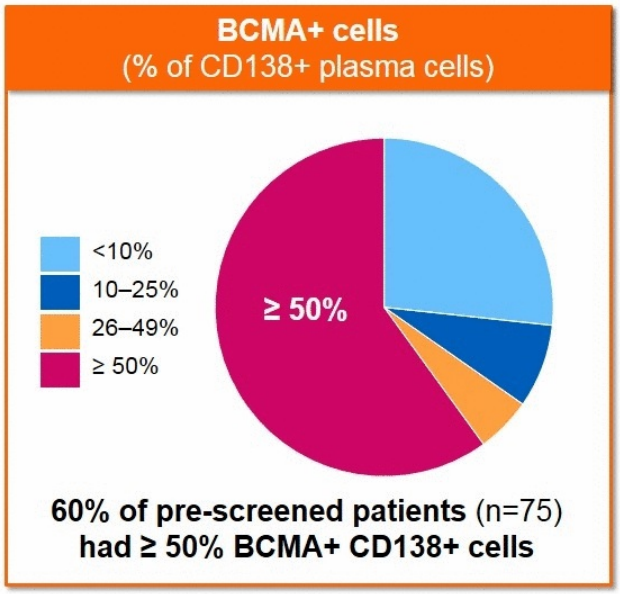
3 + 3 Dose Escalation of CAR + T Cells

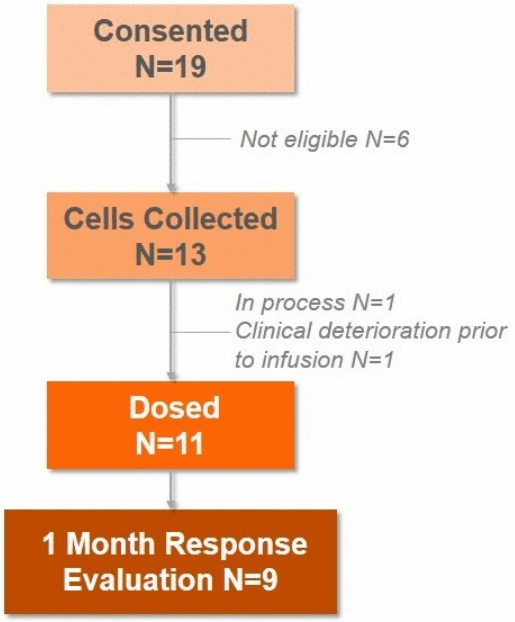
5×10^7 → 15×10^7 → 45×10^7 → 80×10^7 → 120×10^7

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



Study Status as of November 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

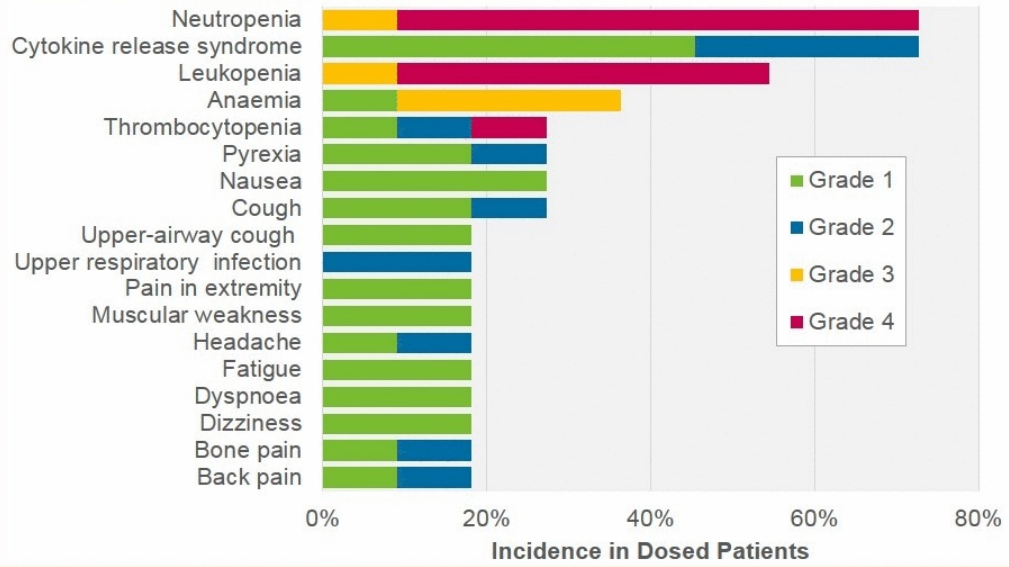
Parameter	Statistic	N=11 Dosed Patients
Prior lines of therapy	Median (range)	**6 (5-13)**
Prior autologous SCT	N (%)	**11 (100%)**
Prior therapies	N (%)	
IMiD		**11 (100%)**
lenalidomide		11 (100%)
pomalidomide		9 (82%)
proteasome inhibitor		**11 (100%)**
bortezomib		11 (100%)
carfilzomib		9 (82%)
daratumumab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

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

Data as of Nov. 18, 2016

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

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

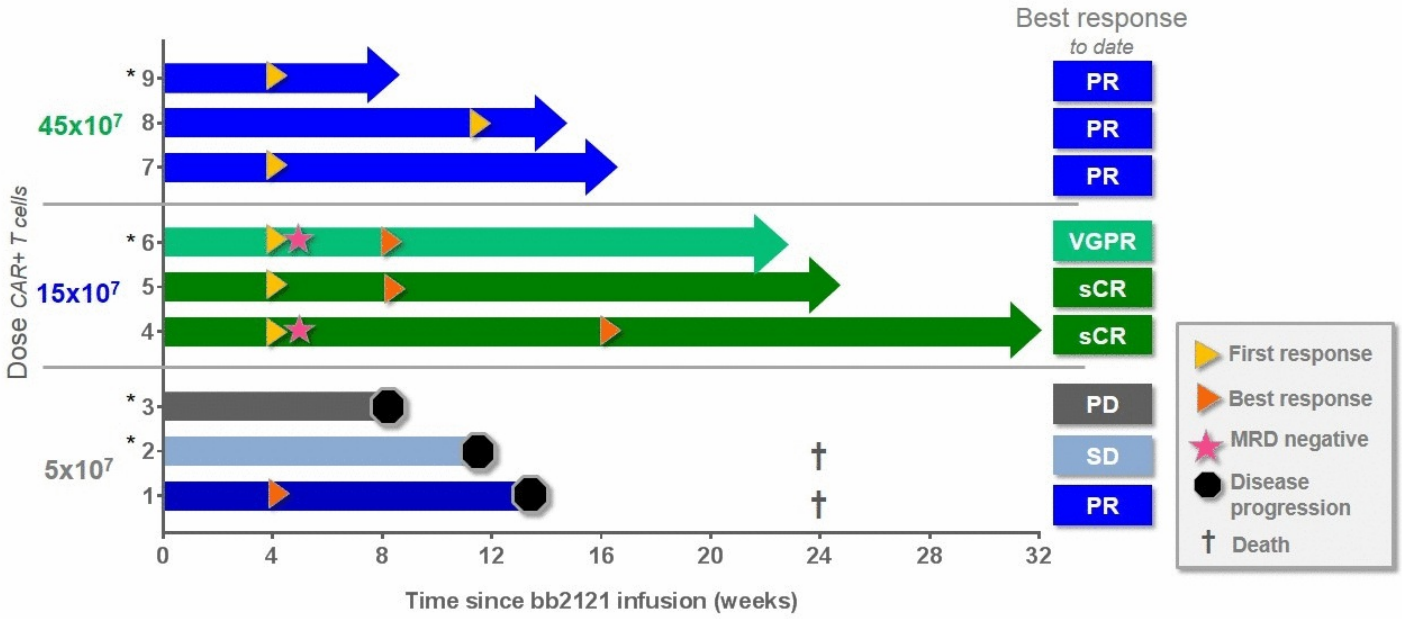


- No DLTs to date
- Cytopenias related to fludarabine/ cyclophosphamide lymphodepletion, as expected
- No ≥ Grade 3 cytokine release syndrome or neurotoxicity

*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

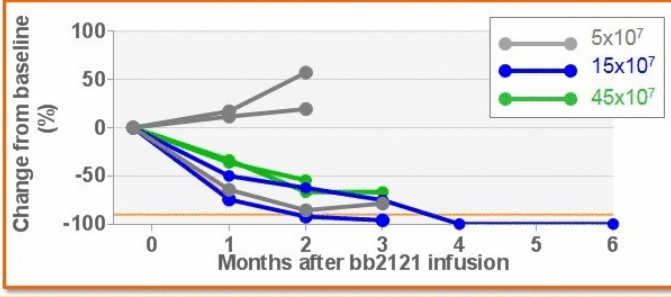


* Patient with ≥50% bone marrow involvement

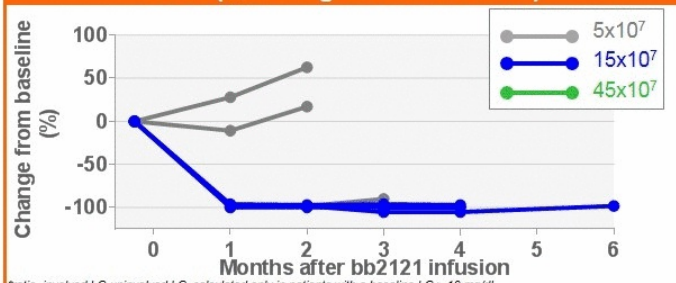
Data as of Nov. 18, 2016

Responses to bb2121 Infusion

Serum M-protein

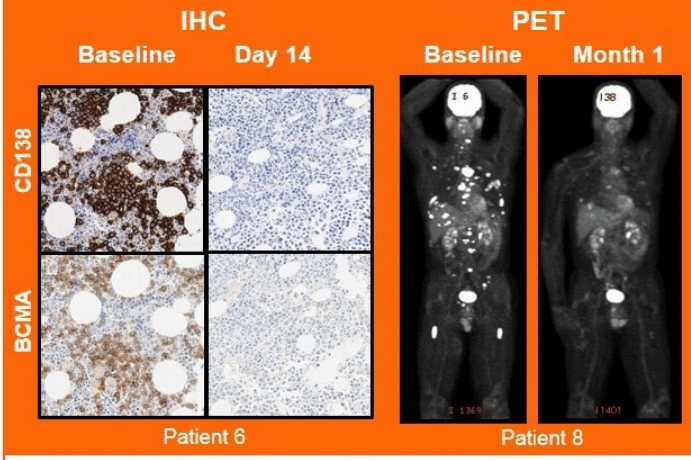


dFLC (% change from baseline)*



*ratio=involved LC-uninvolved LC, calculated only in patients with a baseline LC > 10 mg/dL

Bone marrow response and tumor burden reduction

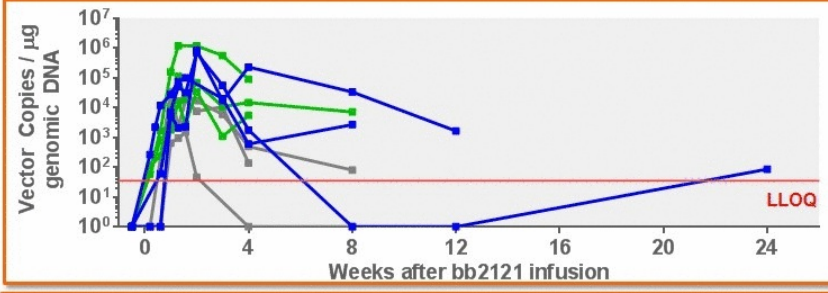


All patients treated at doses > $5x10^7$ with bone marrow involvement at baseline have had no detectable bone marrow disease on Day 14 or beyond

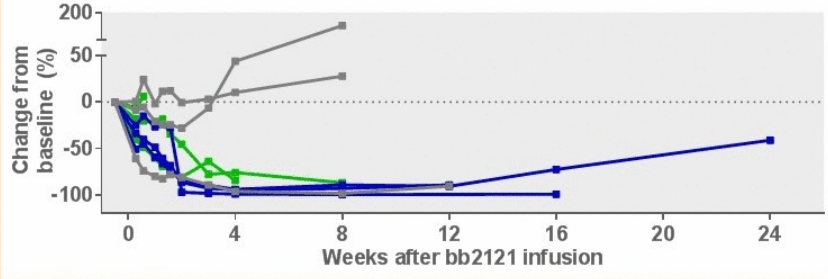
Data as of Nov. 18, 2016

CAR T Cell Expansion at Every Dose

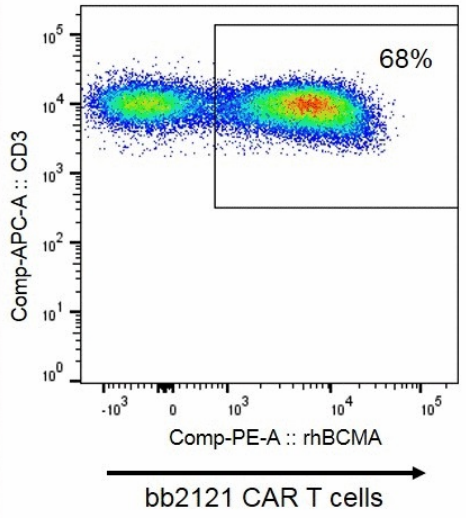
Vector Copies in CD3-enriched Peripheral Blood *by PCR*



Decrease in Serum BCMA Correlated with CAR T Expansion



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

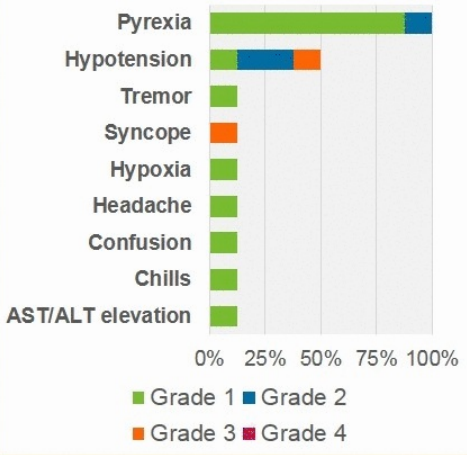


Data as of Nov. 18, 2016

Cytokine Release Syndrome Summary

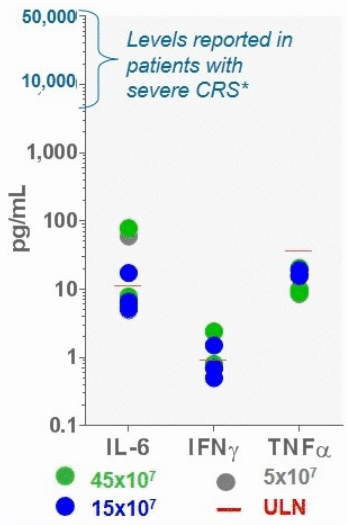
Reported CRS-Related Symptoms

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



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

Data as of Nov. 18, 2016

Summary of Preliminary Clinical Data and Next Steps

- Preliminary results suggest bb2121 demonstrated substantial anti-tumor activity in heavily pretreated patients with multiple myeloma
  - Certain patients 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 to date
  - No dose-limiting toxicities yet identified and dose escalation continues
- Dosing 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

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Questions For Today

Construct?	✓ Lentiviral vector, 4-1bb costimulatory domain, highly optimized scFv
Safety profile?	✓ No dose-limiting toxicities, well tolerated to date
Responses?	✓ 100% response rate in Cohorts 2 and 3 ✓ Two stringent CRs ✓ Two MRD-negative patients (one sCR, one VGPR)
Risk-Benefit?	✓ Objective responses in 7 of 9 patients evaluable for efficacy, with no Grade 3/4 cytokine release syndrome or Grade 3/4 neurotoxicity in any of the 11 patients evaluable for safety
Durability?	✓ Data still early ✓ No patients in Cohorts 2 and 3 have progressed to date ✓ One patient with sCR out 6 months


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