Corporate Presentation

November, 2018

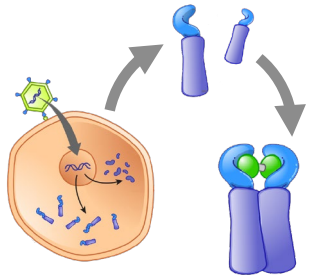
Forward Looking Statement

This presentation contains estimates, projections and other forward-looking statements, concerning, among other things: our research and development activities relating to our CaspaCIDe (“iC9”), GoCAR-T (incorporating “iMC”) and related technologies; our product candidates including rivo-cel (previously BPX-501), BPX-601, BPX-602, BPX-603, BPX-701, and rimiducid; the effectiveness of our CaspaCIDe and GoCAR-T programs and their possible range of application and potential curative effects and safety in the treatment of diseases, including as compared to other treatment options and competitive therapies; the success of our collaborations with academic and commercial partners; the timing, progress of enrollment and success of our clinical trials; and the timing of potential European marketing authorization applications for rivo-cel and rimiducid. Our estimates, projections and other forward-looking statements are based on our management's current assumptions and expectations of future events and trends, which affect or may affect our business, strategy, operations or financial performance. Although we believe that these estimates, projections and other forward-looking statements are based upon reasonable assumptions, they are subject to numerous known and unknown risks and uncertainties and are made in light of information currently available to us. Many important factors, in addition to the factors described in this presentation, may adversely and materially affect our results as indicated in forward-looking statements. All statements other than statements of historical fact are forward-looking statements.

Estimates, projections and other forward-looking statements speak only as of the date they were made, and, except to the extent required by law, we undertake no obligation to update any forward-looking statement. These statements are also subject to a number of material risks and uncertainties that are described more fully in Bellicum’s filings with the Securities and Exchange Commission, including without limitation our annual report on Form 10-K for the year ended December 31, 2017 and our quarterly report on Form 10-Q for the period ended September 30, 2018.

Our Platform

Enhancing T-cell function via controllable molecular switches



Our Clinical Programs

Rivo-cel* (BPX-501)	BPX-601	BPX-701
Hematologic Malignancies & Inherited Blood Disorders	Pancreatic, Gastric, & Prostate Cancers	AML / MDS

Bellicum PHARMACEUTICALS

Striving to deliver cures through controllable cell therapy

Our People

Our Capabilities

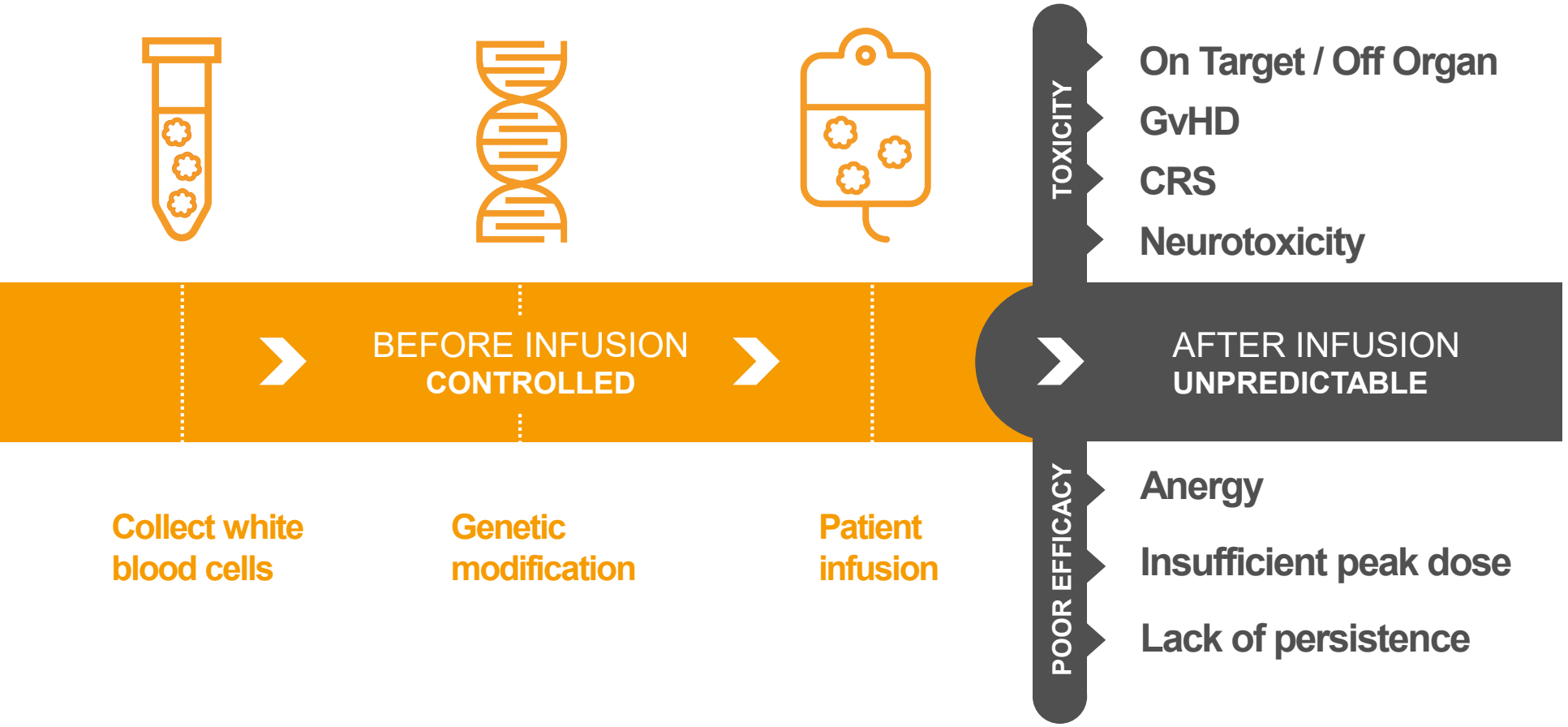
Over 250 patients treated in clinical studies to date

- Translational Research & Clinical Development
- GMP Viral Vector & Cell Manufacturing
- Allogeneic & Autologous Cell Therapy Supply Chain

*Rivo-cel (rivogenlecleucel, formerly BPX-501)

Current Limitations of Cell Therapy

Most cell therapies can only be controlled **before** infusion



Our Approach to Enhance Cell Therapy

Bellicum's molecular switches allow control **after** infusion

BEFORE INFUSION
CONTROLLED

AFTER INFUSION
CONTROLLED

Collect white blood cells

Genetic modification

Patient infusion

iMC ACTIVATION switch
to activate immune cells and modulate the tumor micro-environment

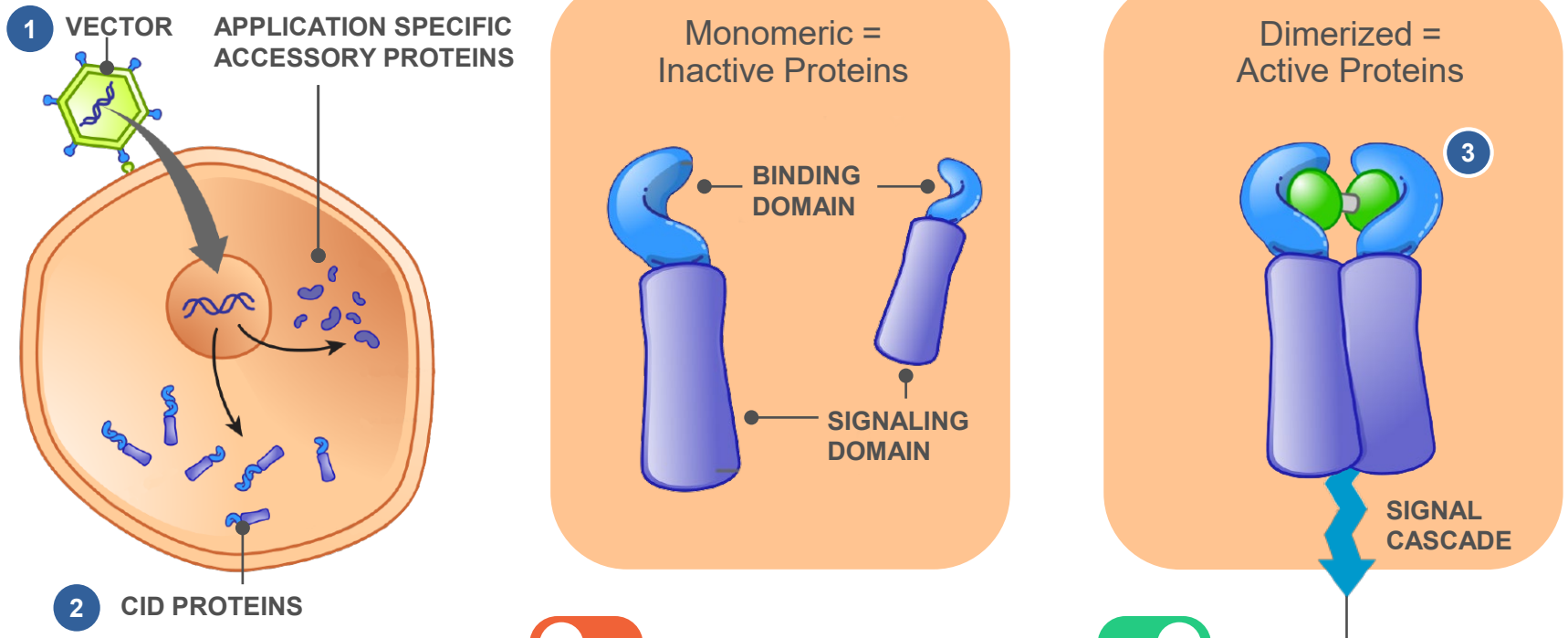
CaspaCIDe SAFETY switch
to eliminate toxic cells

Potential for Improved Benefit / Risk

Chemical Induction of Dimerization ("CID") Molecular Switch Platform

Rimiducid infusion activates signaling pathways to control T-cell function

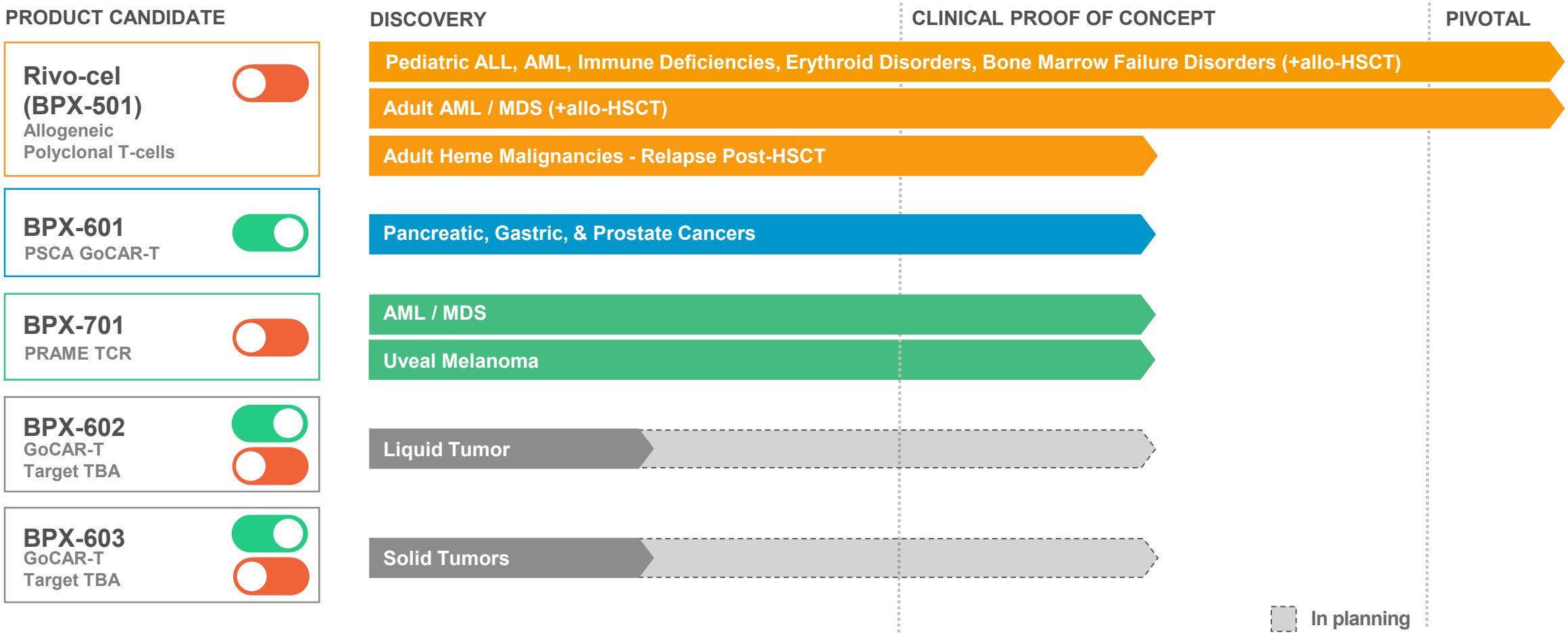
1. Viral transduction transfers the DNA from a **vector** into the target cell nucleus.
2. Vector-derived DNA directs expression of **CID** and **accessory proteins.**
3. **Rimiducid** dimerizes the CID proteins, thus turning on the signal cascade.



Signal	Caspase-9 ("iC9")	MyD88 and CD40 ("iMC")
Result	Apoptosis (cell death)	T-cell activation, proliferation & survival

Highly Differentiated Portfolio

Control switch selected to address situation-specific challenge



Rivo-cel (rivogenlecleucel) Product Overview

Allogeneic polyclonal T-cells incorporating the CaspaCIDe safety switch (formerly BPX-501)

Unmet Need in Leukemias, Lymphomas, and Inherited Blood Disorders

- Potentially cured by allogeneic hematopoietic stem cell transplantation (allo-HSCT)
- Allo-HSCT patients without HLA-matched related donor are at higher risk of morbidity & mortality. Leading causes:
  - Malignant relapse
  - Viral infection
  - Graft Versus Host Disease (GvHD)
- ~70% of allo-HSCT patients lack a HLA-matched related donor
  - Europe – 11,700 patients / year
  - US – 6,300 patients / year
- ~26,000 additional eligible patients forgo allo-HSCT annually in Europe & US in part due to risks

Anticipated Rivo-cel Benefits

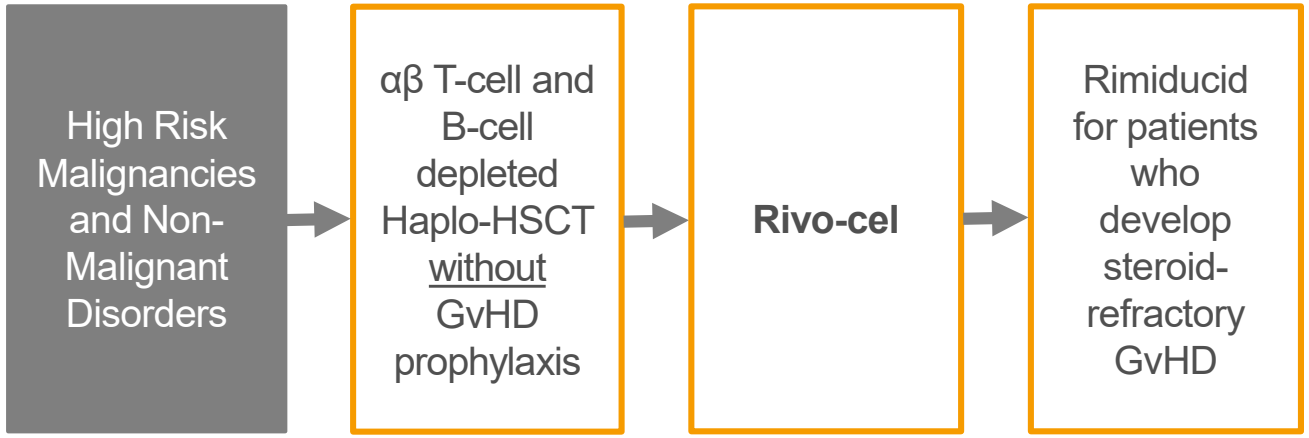
- Graft versus leukemia (GvL) to prevent malignant relapse and extend survival
- Reduce transplant-related mortality (TRM) due to infection
- Ability to treat GvHD via CaspaCIDe

Program Update

- Enrollment complete in Phase 1/2 BP-004 pediatric basket trial – **EMA filing planned for 2019**
- Randomized global Phase 2/3 **THRIVE adult AML / MDS trial planned to initiate in 2018**

BP-004 Trial Schema

Phase 1/2 Study of Rivo-cel Gene Modified Donor T-cells Following TCR $\alpha\beta$ Depleted allo-HSCT



Outcomes:

Rivo-cel:

- Event-free survival at 180 days
  - TRM/NRM, severe GvHD, life-threatening infections
- Progression-free survival
- Disease status

Rimiducid:

- GvHD response

Global Enrollment (n=234)					
Malignant (n=114)			Non-Malignant (n=120)		
Diagnosis	**EU**	**US**	**Diagnosis**	**EU**	**US**
ALL	43	10	Primary Immune Deficiencies	48	17
AML	30	15	β Thalassemia Major	19	2
Other	9	7	Other Erythroid Disorders	6	7
			Bone Marrow Failure Disorders	11	10

Bellicum PHARMACEUTICALS

ClinicalTrials.gov Identifier: NCT02065869

Rivo-cel ASH Preview

Anticipated highlights from the BP-004 study at the 60th ASH Annual Meeting – December 1-4, 2018

92.7%
Transplant EFS at 180 days

- Transplant EFS defined as patients who have not experienced TRM, severe GVHD, or serious infection at 6 months
- Data will be presented at the meeting with interim transplant EFS from an comparator observational MUD study
- Non-inferiority vs the observational MUD study is required for EMA approval

Abstract #2171 – 12/1 @6:15-8:15pm

82.2% / 90.1%
RFS & OS in pediatric leukemia patients

- GvL effect of rivo-cel may contribute to a more durable response and extend survival
- Median of 14.7 months follow-up at the time of data cut-off for the abstract

Abstract #307 – 12/2 @7:30-9am

86%
ORR in patients receiving rimiducid to treat GVHD

- GVHD response in patients either refractory to standard of care or with high grade organ GVHD
- CaspaCIDe safety switch preferentially depletes alloreactive rivo-cel T cells while sparing other T cells

Abstract #2207 – 12/1 @6:15-8:15pm
Abstract #3496 – 12/2 @6-8pm

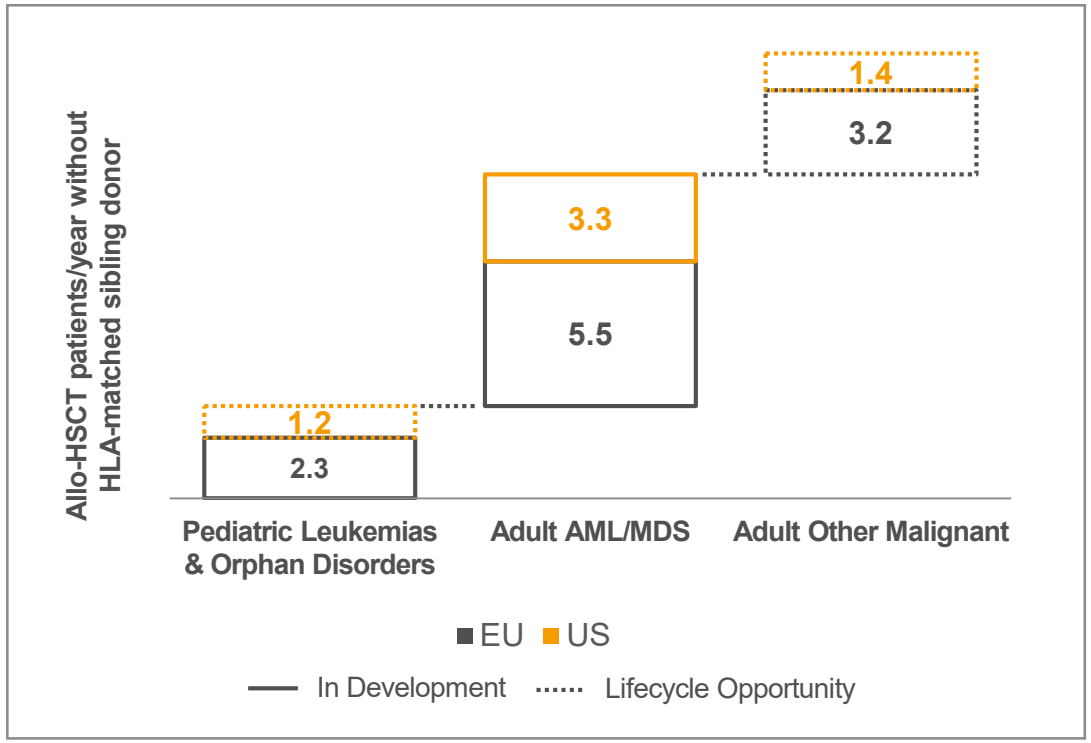
EFS = Event Free Survival
TRM = Transplant Related Mortality
GVHD = Graft vs Host Disease
MUD = Matched Unrelated Donor

RFS = Relapse-Free Survival
OS = Overall Survival
GvL = Graft vs Leukemia
ORR = Overall Response Rate

Note: Data are from abstracts, and will be updated in meeting presentations.

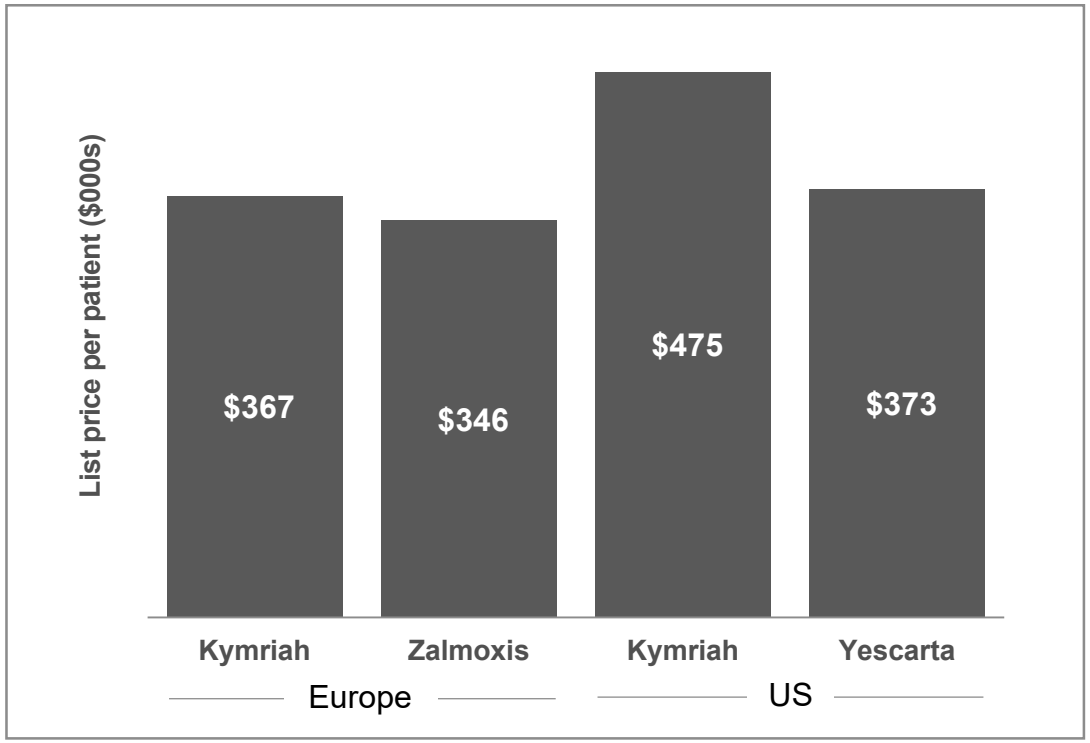
Rivo-cel: Compelling Commercial Opportunity

Large addressable patient population (000's)



Additional ~26k eligible patients per year without HLA-matched donor who forgo transplant represent market growth opportunity

Pricing reflects value in cell therapy



Sources: EBMT Transplant Activity Survey 2016; CIBMTR Current Uses & Outcomes of HCT; internal company analysis

Zalmoxis price assumes 2 infusions per patient, the average observed in clinical trials. Approved range of infusions per patient is 1-4.

Rivo-cel: Compelling Value Proposition

Potential Rivo-cel Benefits

Potential to address the leading causes of morbidity & mortality in curative allo-HSCT

- Malignant relapse
- Viral infection
- GvHD

May reduce healthcare costs for the most complex allo-HSCTs: those without HLA-matched sibling

- May shorten hospital length-of-stay and lower readmission
- May reduce infectious and GvHD complications during and post-discharge
- Eliminates MUD graft procurement costs

Potential to reduce disease burden and associated costs

- May reduce rate of malignant relapse
- Potential to enable curative allo-HSCT in patients without HLA-matched donor

BPX-601 Product Overview

GoCAR-T targeting Prostate Stem Cell Antigen (PSCA)

Unmet Need

High unmet need in solid tumors expressing PSCA

	Incidence (US)	Annual Deaths (US)	% Expressing PSCA
Pancreatic	55k	44k	~60%
Prostate	165k	29k	75-90%
Gastric	26k	11k	76-89%

Strategic Rationale

Attractive first-in-class solid tumor CAR-T opportunity

- Clinically validates the GoCAR-T platform, designed to:
  - Drive T-cell activation, proliferation, and persistence
  - Modulate the tumor micro-environment to enhance immune activity

Program Update

Phase 1 trial enrollment ongoing

- Trial amended Q3 2018
  - Standardized Cy/Flu conditioning
  - Added gastric & prostate cancers
- Initial data presentation planned for December, 2018

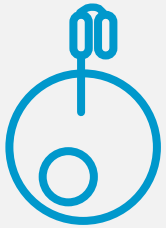
Incidence and annual deaths: Noone AM, Howlader N, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2015, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2015/, based on November 2017 SEER data submission, posted to the SEER web site, April 2018.
PSCA expression: Argani et al, Cancer Res 2001; Reiter et al., PNAS 1998; Abate-Daga et al, HGT 2014; Data on file

GoCAR-T: Designed to Enhance Efficacy

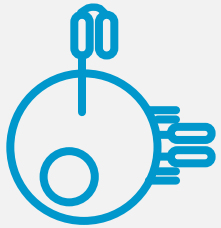
Broad immunological effects of inducible MyD88/CD40 (iMC) activation switch

GoCAR-T

CAR Targeting



TCR Targeting

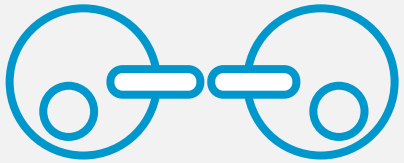


Proliferation/ Self-renewal

Resistance to Inhibitory Factors

HOST IMMUNITY

Costimulation



Antigen Presentation

Tumor Visibility

Immune Cell Recruitment

BPX-601 Phase 1 Trial Dose Escalation

BP-012 trial in relapsed/refractory pancreatic, gastric, and prostate cancers

	Cohort 0 (Lead-in)	Cohort 3	Cohort 4	Cohort 5a	Cohort 5b
Patient Population	3L+ Pancreatic			2L Pancreatic 2L Gastric HR-Refractory Prostate	
BPX-601 Dose *x10^6 cells/kg @ Day 0*	1.25	1.25	2.5	5.0	
Rimiducid Dose *mg/kg @ Day 7*	None	0.4	0.4	0.4	
Conditioning	Cytoxan 1g/m^2 @ Day -3			Cytoxan 1g/m^2 @ Day -3	Cytoxan 0.5g/m^2 Fludarabine 30mg/m^2 @ Days -5, -4, -3
Status	Enrolled			Active	

Trial Highlights and Updates

- Standard 3+3 dose escalation / de-escalation design to establish MTD or RP2D
- Q3 amendment updated conditioning regimen and adds gastric and prostate cancer patients
- Schedule for repeat dosing of rimiducid to be evaluated after cohort 5
- First presentation planned for ESMO Immuno-Oncology meeting in December

ClinicalTrials.gov Identifier: NCT02744287

BPX-701 Product Overview

TCR targeting Preferentially Expressed Antigen in Melanoma (PRAME) incorporating CaspaCIDe

Unmet Need

Several hematologic and solid tumors express PRAME

- Predominantly expressed in AML, uveal melanoma, sarcomas and neuroblastomas

Strategic Rationale

Attractive first-in-class opportunity targeting a cancer/testis antigen

- Supports further proof-of-concept of CaspaCIDe in T-cell therapy

Program Update

Phase 1 trial enrollment ongoing

- Adding sites beginning Q4 2018 to accelerate enrollment
- Initial data presentation planned for 2019

*License/collaboration with Leiden University Medical Center

Anticipated Program Milestones

	2018	2019
Rivo-cel	Nine abstracts accepted for presentation to American Society of Hematology Annual Meeting including: ▪ Interim EFS analyses of BP-004 and comparator MUD trial C-004 ▪ Interim analyses of BP-004 patient subsets of interest, including AML and ALL ▪ Outcomes of BP-004 patients receiving rimiducid to treat GvHD Initiation of Phase 2/3 study in adult AML / MDS	Final analyses of BP-004 and C-004 trials MAA submissions for rivo-cel and rimiducid for pediatric patients
BPX-601	Abstract accepted for oral presentation of initial Phase 1 results at ESMO Immuno-Oncology Congress	Presentation of updated Phase 1 results, including gastric & prostate cancers
BPX-701		Presentation of initial Phase 1 results
PIPELINE		IND submissions for two new dual-switch GoCAR-T programs

Anticipated Data Presentations at ASH 2018

Clinical

Rivo-cel

1. Administration of BPX-501 cells following αβ T and B-cell-depleted HLA-haploidentical HSCT (haplo-HSCT) in children with malignant or non-malignant disorders
   - 1st presentation on interim comparisons between BPX-501 (BP-004) and MUD comparison study endpoints
2. Administration of BPX-501 Cells Following αβ T and B-cell-Depleted HLA Haploidentical HSCT (haplo-HSCT) in Children with Acute Leukemias **(ORAL)**
   - 1st presentation on interim long-term clinical outcomes of combined leukemia cohorts (AML and ALL; BP-004)
3. Administration of BPX-501 following αβ-T and B-cell depleted haplo-HSCT in Children with transfusion-dependent Thalassemia **(ORAL)**
   - Follow-up presentation on long-term clinical outcomes in children with thalassemia major
4. Administration of Rimiducid following haploidentical BPX-501 Cells in Children with Malignant or Non-Malignant Disorders who develop Graft-versus-Host-Disease (GvHD)
   - 1st comprehensive presentation on clinical response and outcomes of standard-of-care refractory GvHD patients treated with rimiducid
5. Administration of BPX-501 cells following αβ- T and B-cell-depleted HLA-Haploidentical HSCT in children with Fanconi Anemia
   - 1st presentation on interim long-term clinical outcomes in children with Fanconi's anemia
6. T- and B-cell neogenesis recovers efficiently in children with acute leukemia given an alpha-beta T-cell depleted haplo-HSCT followed by infusion of donor T-cells genetically modified with inducible caspase 9 suicide gene (BPX-501)
   - 1st presentation on comprehensive post-HSCT immune reconstitution in BP-004

Anticipated Data Presentations at ASH 2018

Pre-Clinical

Rivo-cel

1. Characterization of allogeneic T cells expressing inducible caspase-9 following adoptive transfer in children receiving an HLA-haploidentical hematopoietic stem cell transplant for the treatment of myeloid malignancies
   - Characterization of in vivo persistence and leukemia-antigen associated phenotypes of BPX-501 cells in BP-004
2. Differential expression of inducible caspase-9 (iC9) in allogeneic T cells allows selective depletion of activated T cells following exposure to rimiducid and permits *in vivo* allodepletion
   - 1st demonstration of cell activation state association with iC9 expression and subsequent sensitivity to rimiducid-induced apoptosis
3. A simplified method for transduction and expansion of T cells for clinical application
   - Demonstration of a more efficient method of production of allogeneic T cells

Go-CAR

4. Regulated natural killer cell expansion and anti-tumor activity with inducible MyD88/CD40
   - 1st demonstration of orthogonally regulated dual-switch/IL-15 CD123-CAR NK cells with iMC-directed expansion, persistence and anti-tumor activity in a preclinical mouse model

Anticipated Data Presentation at ESMO I-O 2018

Clinical

BPX-601

Ligand-Inducible, Prostate Stem Cell Antigen (PSCA)-Directed GoCAR-T™ Cells in Advanced Solid Tumors: Preliminary Results from a Dose Escalation Study

- 1st presentation on a first-in-class controllable (inducible) CAR-T summarizing initial safety and pharmacodynamic data on cell-dose escalation cohorts in Part 1 of BP-012 in advanced pancreatic cancer patients

Abstract #68O – December 14 @9:30am

Financial Highlights

Cash and Investments

$118.4 million of cash, restricted cash and investments as of **September 30, 2018**

Cash Guidance

Expect that current cash resources will be sufficient to meet operating requirements through 2019

Shares Outstanding

43.4 million shares of common stock at **September 30, 2018**

Bellicum

Striving to deliver cures for cancer and rare diseases through controllable cell therapy

Industry-leading CID switch platform for controlling cell therapy

- iMC activation switch to enhance efficacy, particularly in solid tumors
- CaspaCIDe safety switch to manage toxicity

Growing portfolio of differentiated oncology & hematology programs

- Rivo-cel – Best-in-class allogeneic T-cell product in hematologic malignancies and inherited blood disorders
- BPX-601/701 – First-in-class GoCAR-T and TCR products
- BPX-602/603 – First controllable "dual-switch" GoCAR-Ts to enter clinic in 2019

Fully integrated cell therapy capabilities support future growth

- Robust R&D, clinical, and manufacturing capabilities
- Ongoing collaborations with other leaders in the field

Bellicum Leadership Team

Rick Fair
President & CEO
Rick has a 20-year track record as a strategist and commercial leader in the biopharmaceutical industry. Rick joined Bellicum in 2017 from Genentech/Roche.

David Spencer
Chief Technology Officer
Dave is the inventor of CID technology, and co-developed the first clinical applications of the technology, DeCIDe® and CaspaCIDe®.

Thierry Darcis
General Manager, Europe
Thierry has over 20 years of experience in European and global marketing, product development, and operations. He joined Bellicum in 2018.

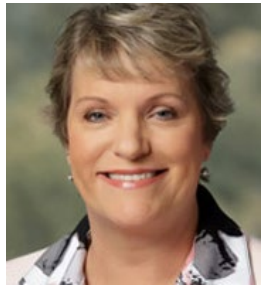
William Grossman
Chief Medical Officer
Bill has an extensive background in the development of cancer immunotherapies and joined Bellicum in 2018 from Genentech/Roche.

Aaron Foster
Vice President Translational Research & New Product Development
Aaron leads the CAR and TCR gene-modified T-cell programs that are developing systems for controlling T-cell behavior *in vivo* using molecular switch technology.

Shane Ward
General Counsel & Corporate Secretary
Shane is a seasoned public company executive with over 20 years of biotechnology and pharmaceutical industry experience. Shane joined Bellicum in 2018.

Gregory Naeve
Chief Business Officer
Greg joined in 2017 from Pfizer, where he was ImmunoOncology & Cell Therapy Lead in their External Research and Development Unit. He was previously a Principal at The Column Group.

Alan Smith
Exec. Vice President Tech Operations
Alan has over 30 years of experience in R&D, Manufacturing and Quality roles in cellular therapeutics.

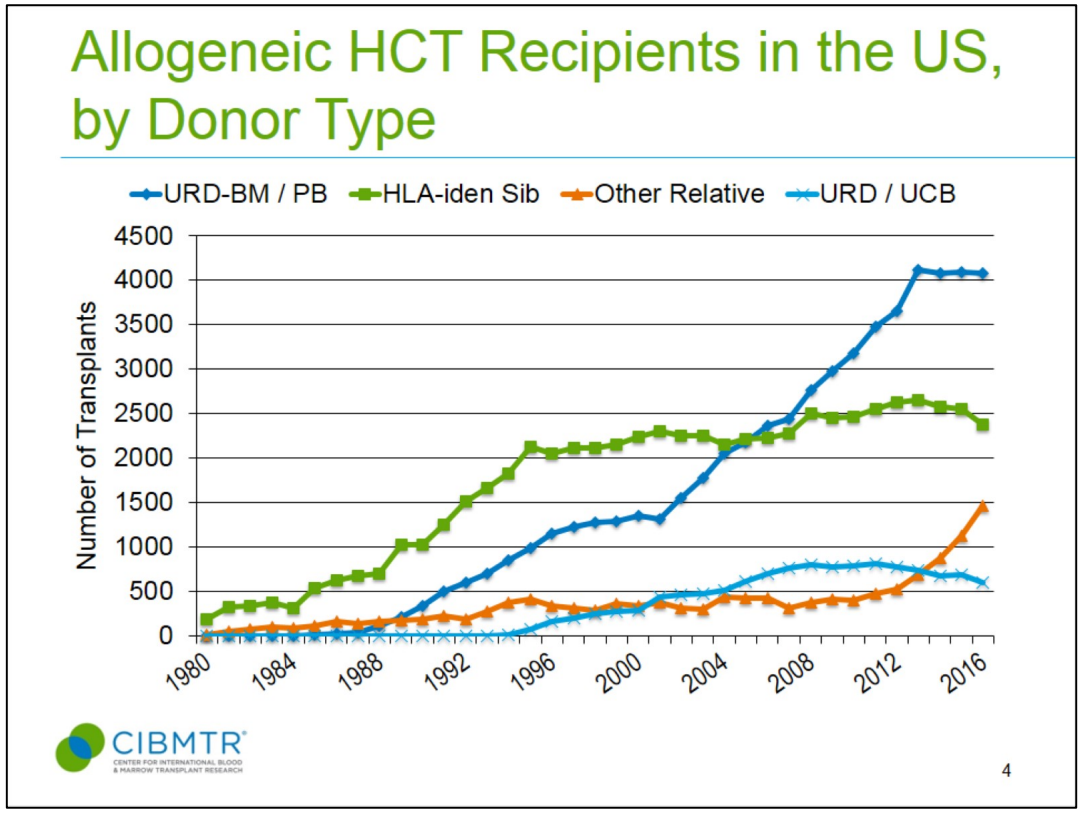


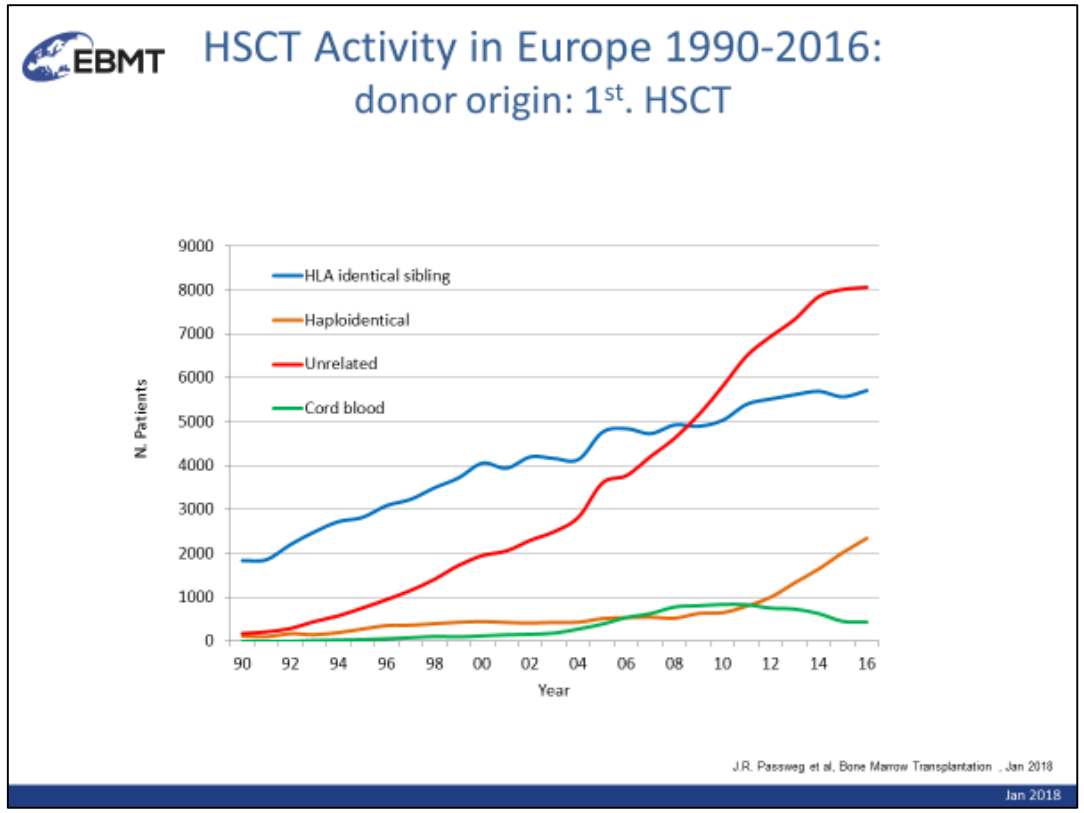
Rosie Williams
Vice President Finance & Controller
Rosie is a CPA and has over 30 years of experience in finance and accounting at Arthur Andersen and in a variety of companies and industries. She joined Bellicum in 2014.

Genentech — A Member of the Roche Group
Baylor College of Medicine
Janssen
MERCK
Baxter
abbvie
BIOTHERA pharmaceuticals
Pfizer
INSTITUTE OF REGENERATIVE MEDICINE
Stanford University
VERSARTIS
DYNAVAX — INNOVATING IMMUNOLOGY
Abbott
ZogenIX
ViroPharma
NPS Pharma
gsk GlaxoSmithKline
NOVARTIS
ARTHUR ANDERSEN

APPENDIX

Uptake of Haplo HSCT has accelerated in the last decade



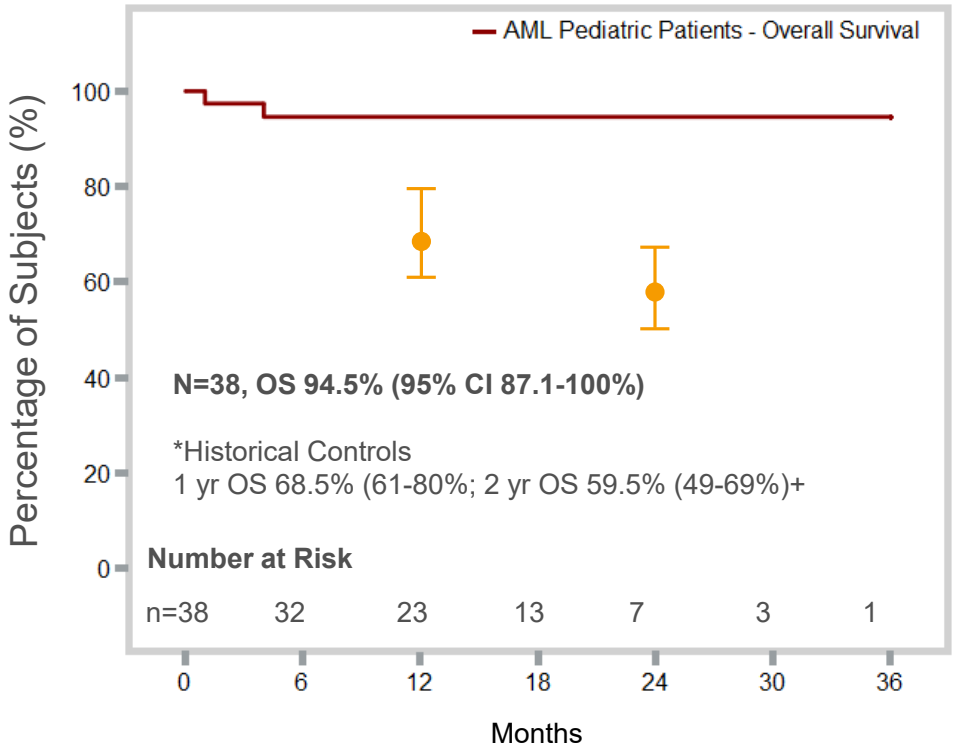


Sources: CIBMTR Current Uses and Outcomes of HCT 2017; EBMT Activity Survey 2016

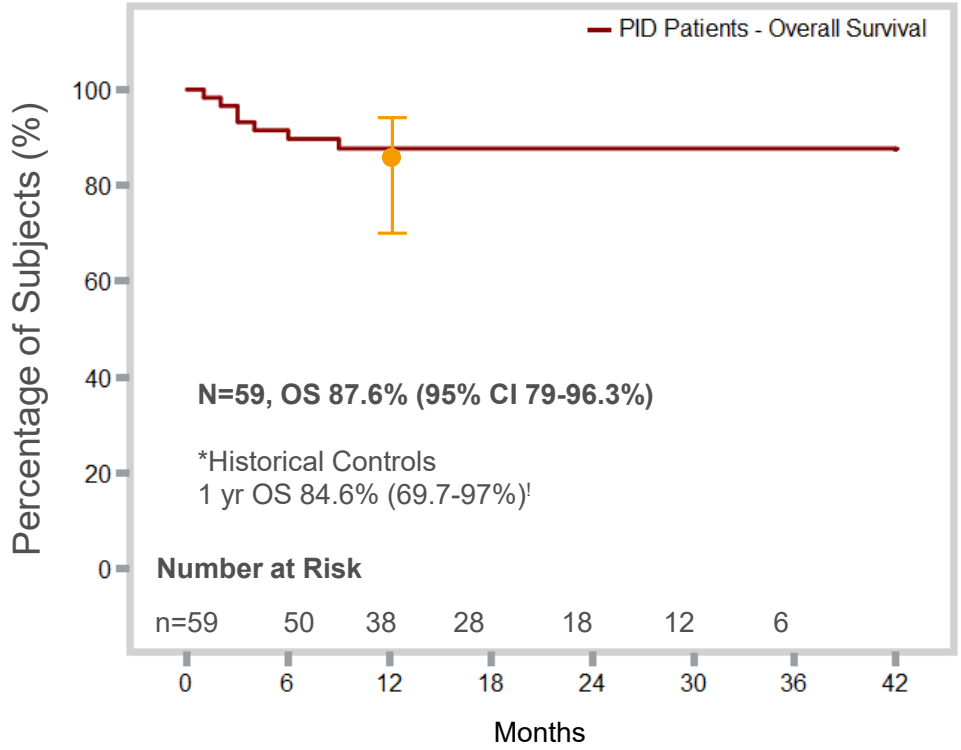
BP-004 Interim Results and Selected Historical Controls

Updated subset results presented at European Hematology Association Congress (June, 2018)

AML Overall Survival



PID Overall Survival



*DFS, Shaw 2010; EFS, Klein 2017. +Shaw PJ, 2010; MacMillan 2008, CIBMTR 2008-2012, Michel 2003 ! Balashov 2015; CiBMTR 2008-2012.

Response to rimiducid in AML and PID (EHA 2018)

Combined data from AML and PID patients who received rimiducid (n=12); **ORR 82%** in 11 evaluable patients

Overall Grade	Stage	Response
I	Stage 2 skin	CR
I	Stage 1 skin	CR
I	Stage 2 skin	PR
II	Stage 3 skin , Stage 1 upper GI	CR
II	Stage 1 skin, Stage 1 upper GI	CR
II	Stage 3 skin	CR
II	Stage 3 skin	CR
II	Stage 1 upper GI	CR
II	Stage 3 skin	NE
III	Stage 3 gut	NR*
III	Stage 3 liver	CR
III	Stage 3 liver	NR

*NR: No expansion of BPX-501 cells; NE: Patient on corticosteroids and cyclosporine with controlled GvHD but failure to wean corticosteroids. Rimiducid given in attempt to wean cortiocsteroids