

**Ambition: Curing Blood Cancers
through cell and genome engineering**

December 2024



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Vor Bio Clinical Strategy

Thesis: Trem-cel as a Therapeutic Platform

Enabling multiple targeted therapy modalities



ADCs



CAR-Ts

Early Clinical Strategy

Current Clinical Findings



Trem-cel

+



Mylotarg



VCAR33^{ALLO}

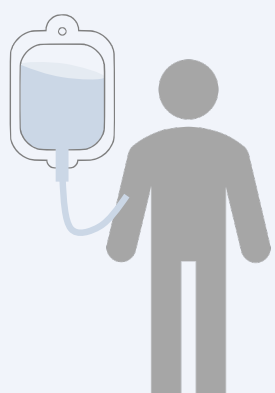
- Demonstrate clinical proof-of-principle with Mylotarg as approved agent
 - Engraftment of gene engineered graft
 - Shielding the blood system
- Most rapid path to Treatment System
- Testing as monotherapy in post-transplant relapse

- Encouraging data with commercial promise
 - 100% engraftment
 - Robust shielding of the blood system
 - Broadened therapeutic index for Mylotarg
 - Early evidence of patient benefit (RFS)
- Encouraging biomarker data at lowest dose




Even After Transplant, High-Risk AML Has Poor Outcomes

Transplant



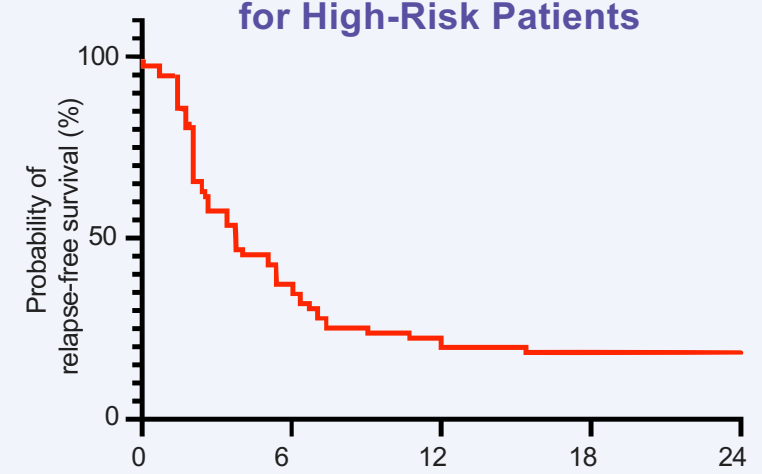
A mainstay treatment

After Transplant



Maintenance therapy unfeasible due to drug toxicity

Watchful Waiting Outcomes for High-Risk Patients

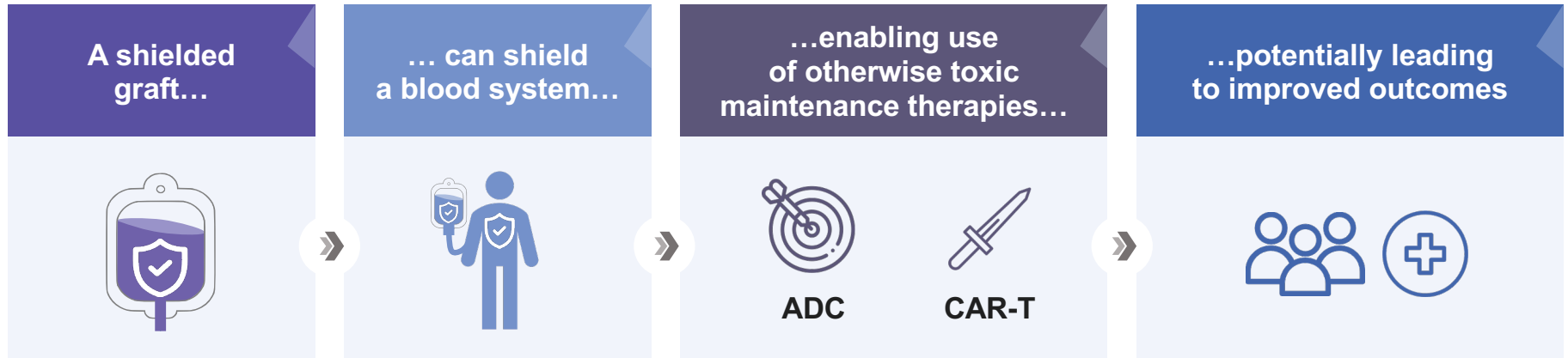


Araki et al. JCO 2016

Frequent leukemia relapses and death, poor outcomes



What If Shielding Could Lead to Improved Outcomes?

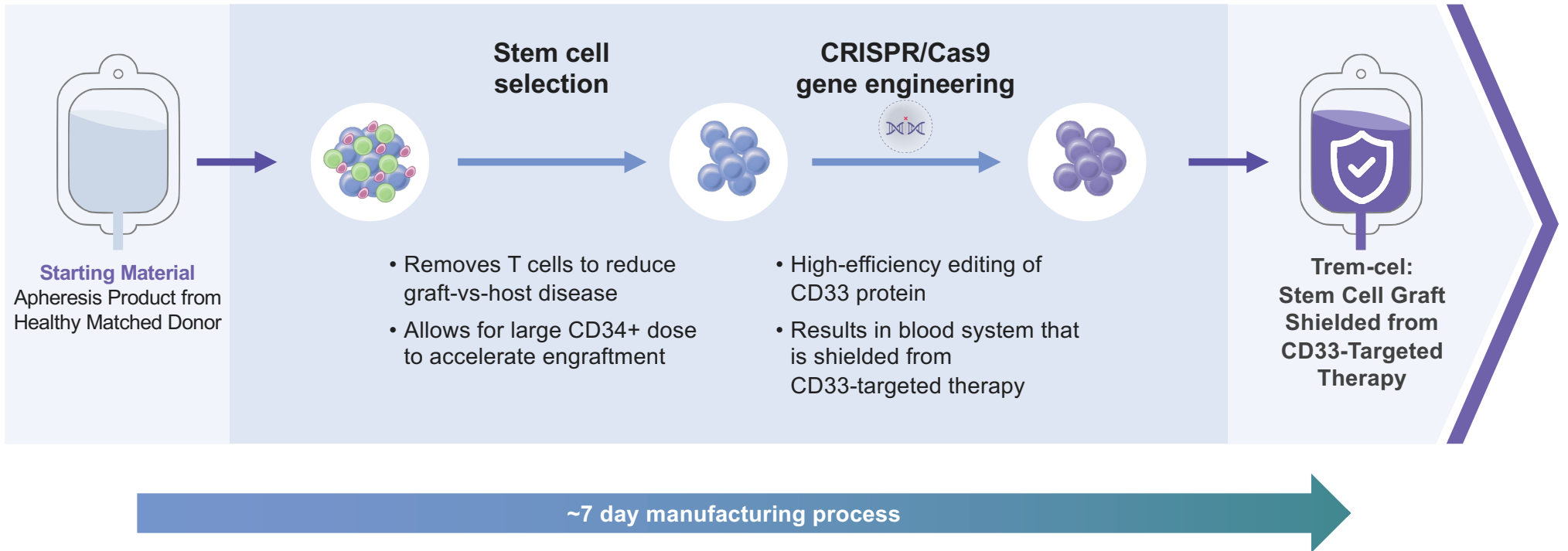


Required Shielded Graft Attributes

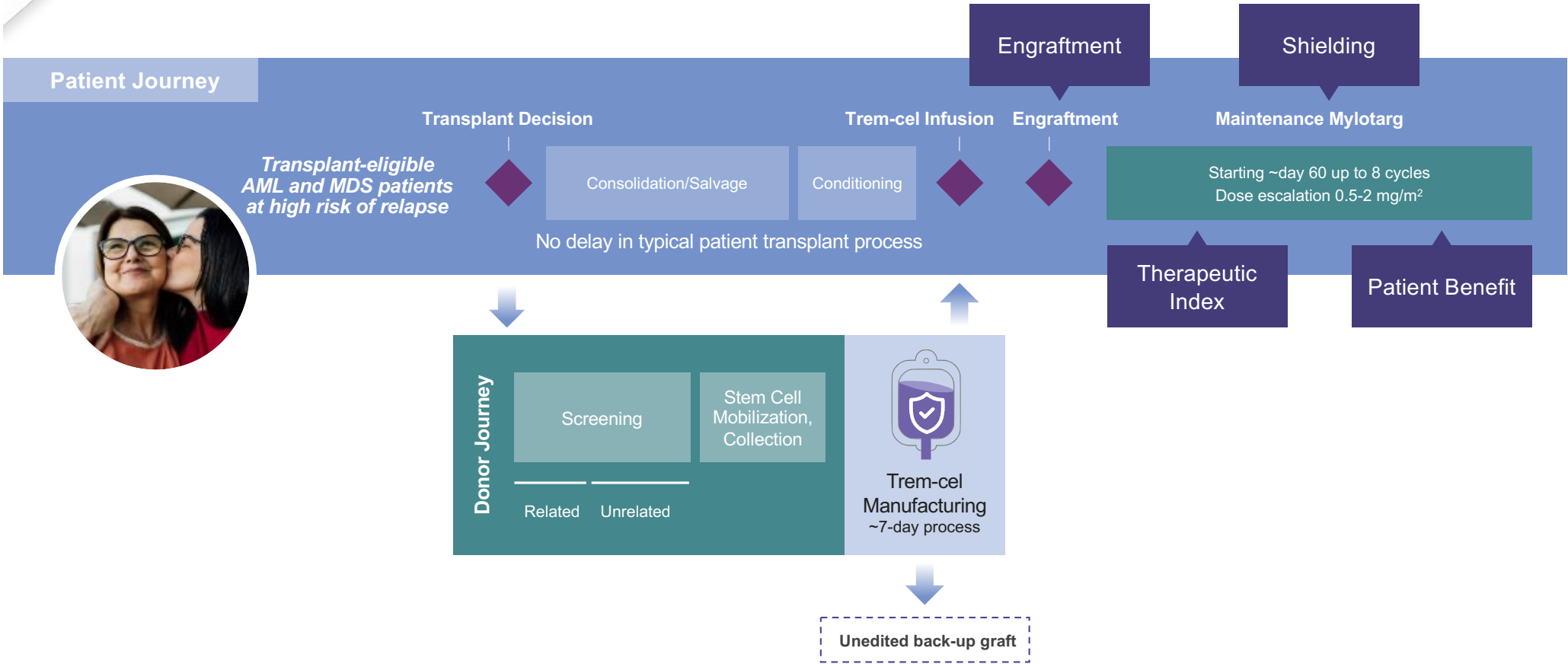
- ✓ **Engraftment**
Reliably reconstitute the blood system
- ✓ **Shielding**
Protect against otherwise toxic therapies
- ✓ **Therapeutic Index**
Optimize efficacy and safety of maintenance therapies
- ✓ **Patient Benefit**
Prolong relapse-free survival



What is Trem-Cel?



VBP101: Trem-cel Phase 1/2a Clinical Trial





Trem-cel Achieved Timely Engraftment

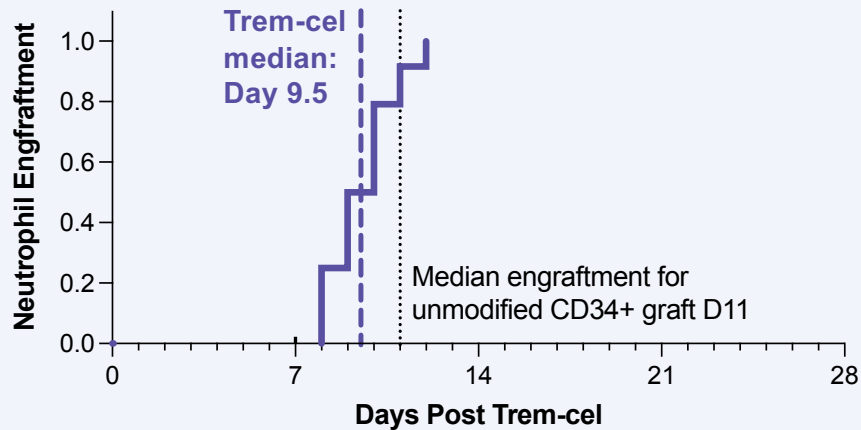
✓ Engraftment

✓ Shielding

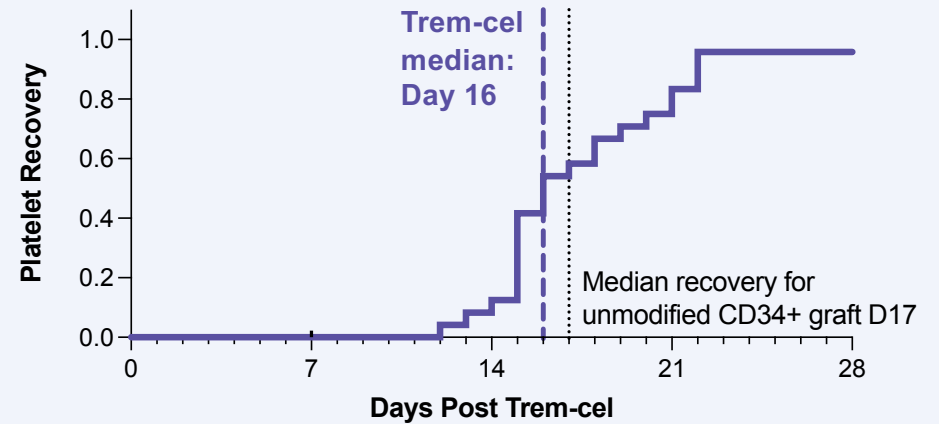
✓ Therapeutic Index

✓ Patient Benefit

Neutrophil Engraftment (n=25)



Platelet Engraftment (n=25)



✓ High CD33 editing efficiency (median 90%, range 71-94%)

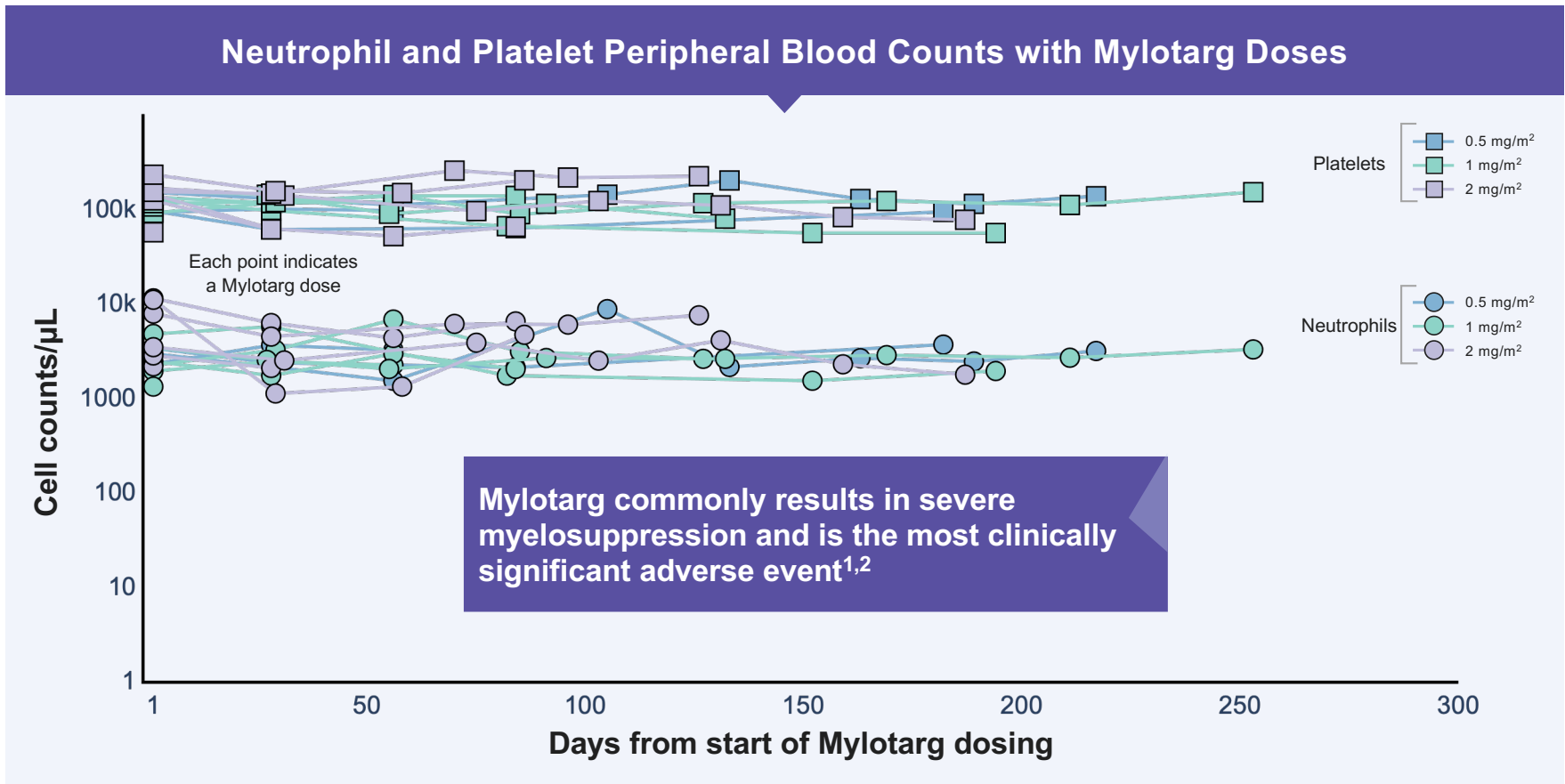
✓ 100% neutrophil engraftment

✓ 100% achieved full myeloid chimerism at D28

Data cut-off: 1-NOV-2024



Trem-cel Demonstrated Shielding Across Mylotarg Doses

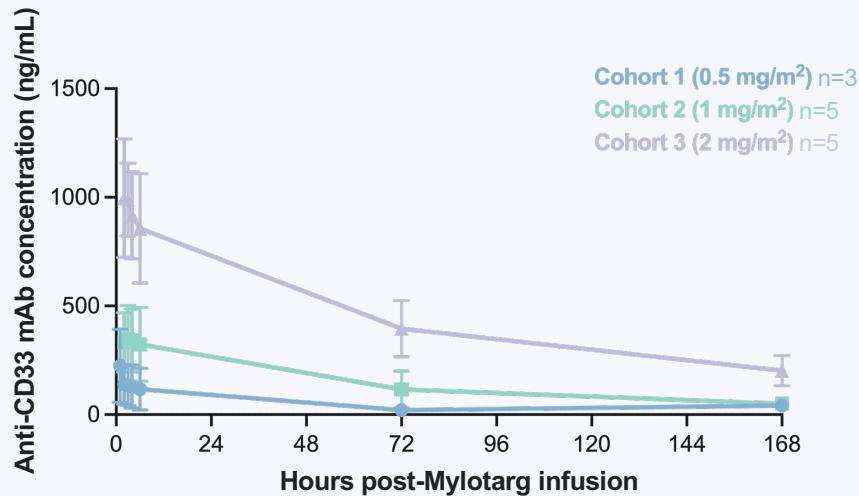


9 1. Sievers et al. Blood 1999 2. Mylotarg prescribing information
Data cut-off: 1-NOV-2024

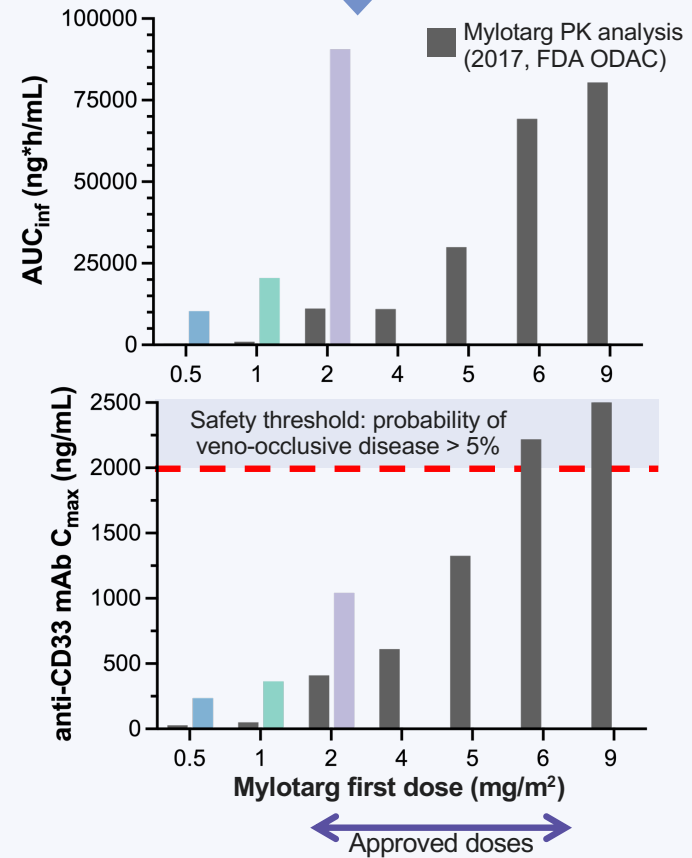


Trem-cel Enabled Broadened Therapeutic Index for Mylotarg

Mylotarg Pharmacokinetic Profile



C_{max} and AUC Across Mylotarg Doses





Baseline Risk Factor Demographics for AML Patients: VBP101 vs. Comparators

Disease Characteristic	VBP101 AML ITT (n=24)	VBP101 AML Treated with Mylotarg (n=15)	Araki MRD+ Cohort ⁽²⁰¹⁶⁾ (n=76)	Jentzsch Adverse Risk Cohort ⁽²⁰²²⁾ (n=271)
Cytogenetics Risk ELN 2022				
Favorable	8%	13%	3%	N/A
Intermediate	33%	27%	58%	N/A
Adverse	58%	60%	39%**	100%*
Other AML Risk Factors				
TP53 mutation	33%	40%	NR	NR
Secondary AML ^a	42%	33%	42%	49%
Disease Burden Status				
Remission (MRDneg)	75%	73%	N/A	20%
MRD+ (>0.1-<5% blasts by flow)	13%	20%	100%*	13%
Active disease (≥5% blasts)	13%	7%	N/A	32%***
AML Disease Status				
CR1	63%	60%	67%	61%
CR2	25%	33%	33%	7%
Relapsed or refractory	13%	7%	0	32%***
Adverse Risk Features (Adverse ELN/molecular/cytogenetic, Secondary AML, MRD or active disease, CR2 or Relapsed/Refractory), n (%)				
1	11 (46%)	6 (40%)		
2 or more	13 (54%)	9 (60%)		

*Selected comparison cohort (n) from published studies. **Adverse cytogenetics. ***Includes partial remission, relapsed, refractory. Jentzsch values for disease burden status do not total 100% due to data not reported.

^aDefined as AML with myelodysplasia-related change and therapy-related AML, NR=not reported, N/A=not applicable

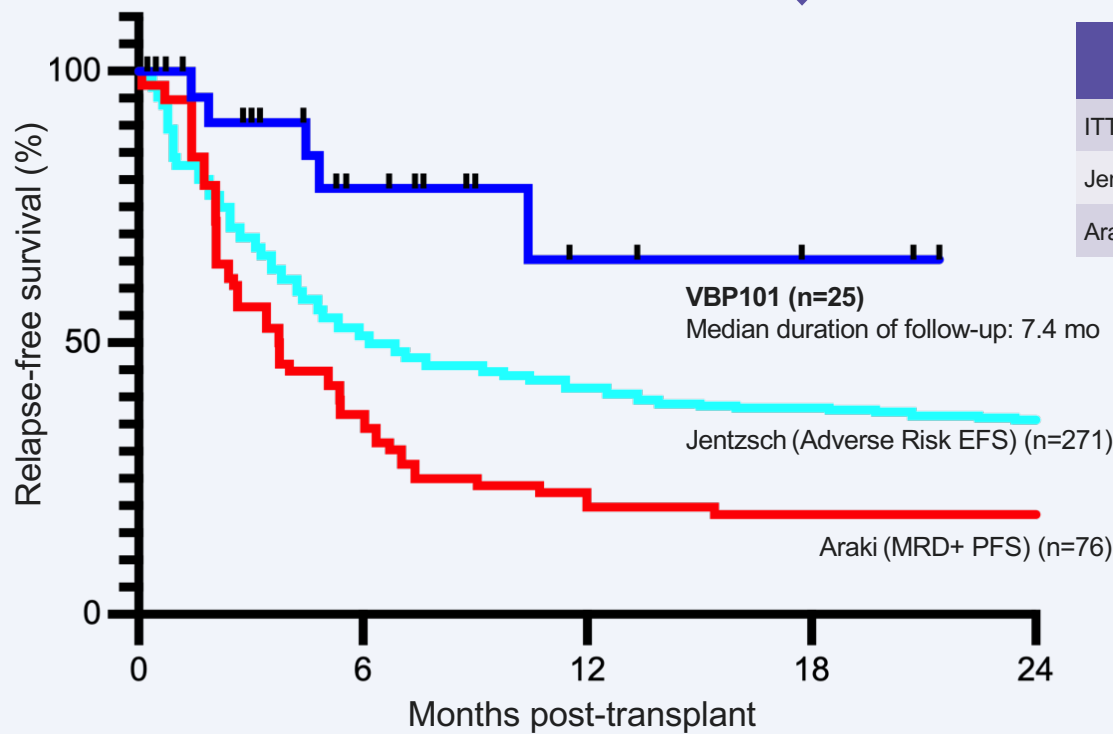
Data cut-off: 01-NOV-2024



Trem-cel+Mylotarg RFS Appears Favorable vs Published High-Risk AML Comparators

- ✓ Engraftment
- ✓ Shielding
- ✓ Therapeutic Index
- ✓ Patient Benefit

Relapse-Free Survival of VBP101 (intention-to-treat) vs Araki and Jentzsch (historical controls)



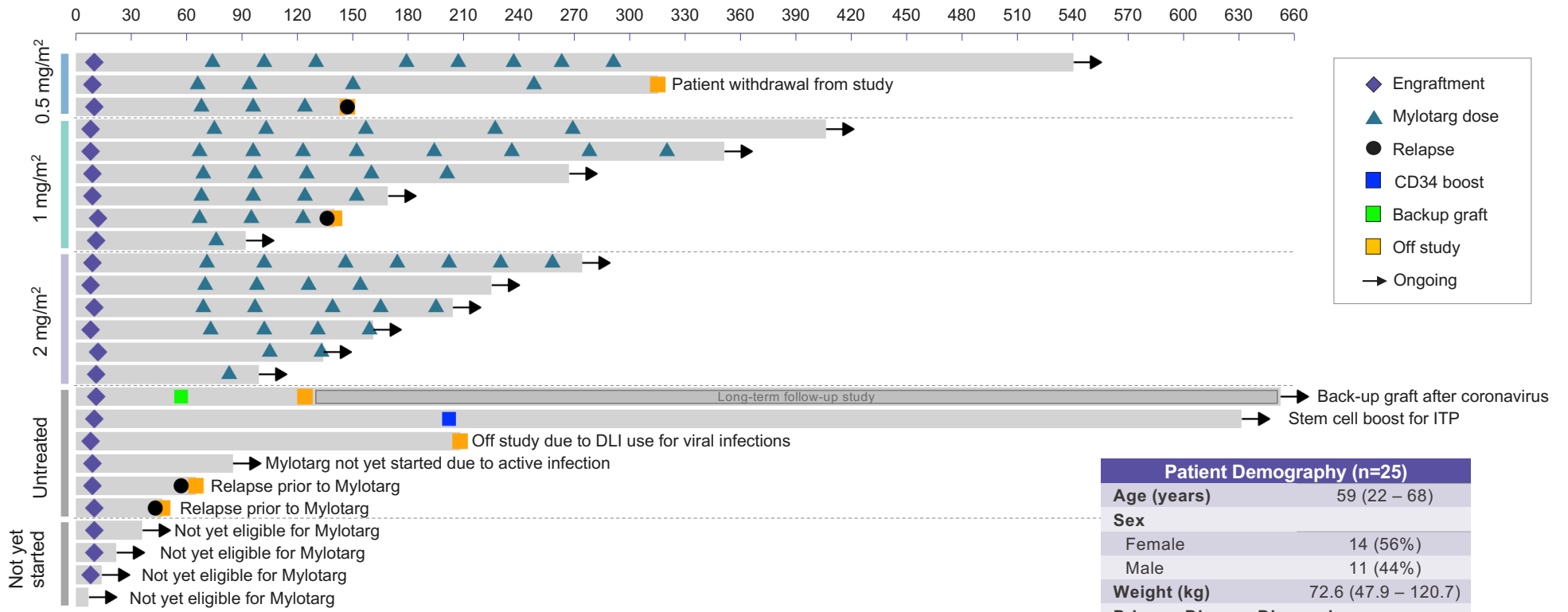
	Median RFS (mo)	P value vs VBP101*	Hazard Ratio* (HR)	HR 95% CI*
ITT	Not reached			
Jentzsch	6.2	0.02	0.36	0.21-0.64
Araki	3.8	0.0004	0.23	0.14-0.40

- Four relapses observed: (all CD33 positive at relapse)
 - 2/4 relapsed prior to Mylotarg treatment
 - 3/4 transplanted with active disease; 1/4 with MRD
 - 4/4 adverse risk cytogenetics
- One patient died off-study due to complications of viral infection

VBP101 data cut-off: 1-NOV-2024. Adapted from Fig 2B MRD+ PFS line from Araki et al. JCO 2016; Adapted from Fig 1C, ELN 2022 Adverse risk EFS line from Jentzsch et al. Blood Cancer Journal 2022. * = individual comparison to VBP101 using log-rank Mantel-Cox test. Data not from head-to-head trial.



Low Rate of Relapse (2/15) Among Patients Receiving Mylotarg



ITP: idiopathic thrombocytopenic purpura or similar immune-mediated thrombocytopenia
 Data cut-off: 1-NOV-2024



Any Grade Treatment Adverse Events After Receiving Mylotarg (n=15)

Adverse Event	Grade 1	Grade 2	Grade 3	Grade 4
Hematologic				
Anemia	-	1/15 (7%)	3/15 (20%)	-
Autoimmune hemolytic anemia	-	-	1/15 (7%)	-
Leukopenia	-	-	1/15 (7%)	-
Lymphocyte count decreased	1/15 (7%)	-	-	-
Lymphopenia	-	-	1/15 (7%)	-
Neutropenia	-	2/15 (13%)	3/15 (20%)	-
Platelet count decreased	-	-	2/15 (13%)	-
Thrombocytopenia	-	1/15 (7%)	1/15 (7%)	1/15 (7%) ^a
Hepatobiliary				
ALT increased	2/15 (13%)	1/15 (7%) ^b	-	-
AST increased	1/15 (7%)	-	1/15 (7%) ^b	-
Biliary colic	1/15 (7%)	-	-	-
Alk Phos increased	3/15 (20%)	-	-	-
Blood bilirubin increased	1/15 (7%)	-	-	-
LDH increased	2/15 (13%)	-	-	-
Cholecystitis	-	2/15 (13%)	-	-
Veno-occlusive disease	1/15 (7%) ^c	-	-	-

^aFollowing adverse event, patient continued to receive multiple cycles of Mylotarg

^bALT/AST elevation attributed to fluconazole toxicity and resolved after discontinuation

^cMild grade late-onset veno-occlusive disease occurred 97 days after 0.5 mg/m² Mylotarg dose. Predisposing factors included azole toxicity, concurrent norovirus infection and gram-negative bacteremia.

ALT = Alanine aminotransferase; AST = Alanine aminotransferase; Alk Phos = blood alkaline phosphatase; LDH = blood lactate dehydrogenase

Data cut-off: 1-NOV-2024



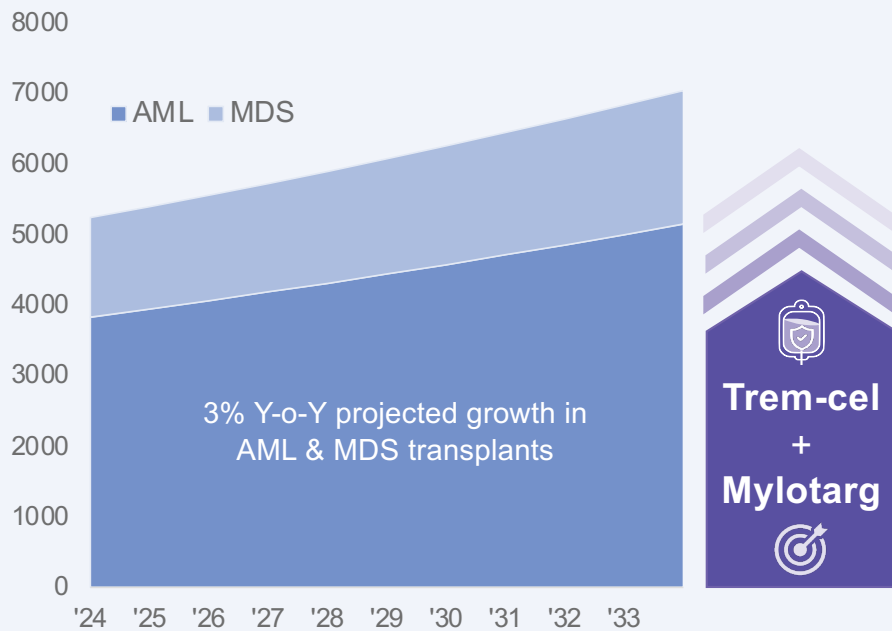
Clinical Update Summary

- Robust neutrophil engraftment, platelet recovery and full donor myeloid chimerism
- Consistent shielding from Mylotarg-related cytopenias during repeated 0.5, 1, and 2 mg/m² doses
- Immune reconstitution, multilineage chimerism, and safety profile similar to unedited CD34-selected grafts
- Broadened Mylotarg therapeutic index following trem-cel
- Preliminary data suggesting improved RFS compared to published groups of AML patients at high risk of relapse post-HCT



Trem-cel Platform with Potential >\$1B Commercial Opportunity

Opportunity to Replace Standard of Care Transplant



Transformative Treatment



- Shielded transplants to prevent on-target toxicity
- Targeted treatments to improve relapse free survival

Concentrated Market Opportunity



- ~80% of transplants in 65 US centers
- ~5,000 AML & MDS transplants per year

Reimbursement Pathway



- 100% cost-based reimbursement for eHSCs*
- Commercial example: Omisirge® at \$338,000



Physician Feedback on Trem-cel + Mylotarg Value Proposition



Perceptions of Trem-Cel

- Streamlined manufacturing with **consistent engraftment**
- Provides **protection of donor cells** from on-target toxicity
- Positive impact on patient outcomes and **reduced GvHD**
- **Enable maintenance therapy** to reduce relapse is compelling

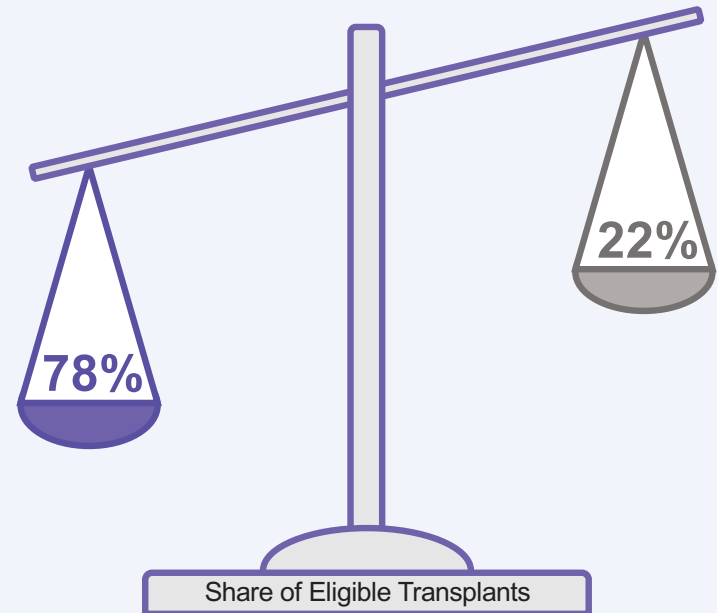


Perceptions of Mylotarg

- As **monotherapy**, concern for **hepatotoxicity** and neutropenia
- With **trem-cel**, **relative safety concerns are alleviated**
- Benefit of protection with **improved RFS vs. traditional HSCT**

Trem-Cel + Mylotarg

SoC Transplant

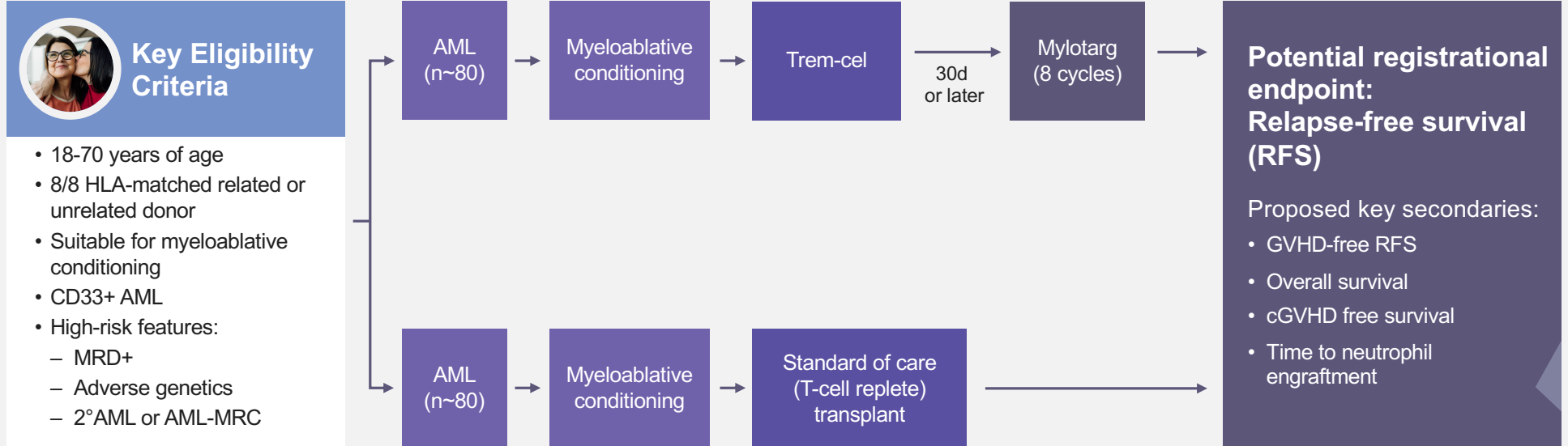


"I think using that [Trem-Cel + Mylotarg] would aid in the optimization of transplant outcomes and reduce relapse, which is one of the major causes for post transplant mortality." Hematologist-Oncologist



Potential Registrational Trial Design for Trem-cel/Mylotarg

Patient Journey





Summary of FDA Response to Type C Meeting Request

- Agreement that trem-cel engrafts neutrophils and platelets and has a similar safety profile to unedited CD34+ grafts
- Agreement with the trem-cel-Mylotarg registrational clinical trial design with respect to study population, control arm, primary endpoint, stratification factors, and statistical design
- Agreement to provide further updates to FDA from the VBP101 trial alongside submission of the full registrational clinical trial protocol



VCAR33^{ALLO}: CD33-Directed Healthy Donor-Derived CAR-T



Cells harvested from prior transplant donor



Rapid process to preserve stemness



Terminally frozen for convenience

T cells exactly matched to patient's immune system

Healthy, stem-like cells more likely to expand and less prone to exhaustion

Clinically validated construct:
NIH study using autologous cells showed efficacy at 1×10^7 CAR+ cells/kg (2/5 assessable pts)¹

1. Shah et al. ASH 2023

VBP301: VCAR33^{ALLO} Phase 1/2 Clinical Trial

Patient Journey

MRD⁺ or relapsed AML following standard or *trem-cel* transplant

Enroll

VCAR33^{ALLO} Infusion

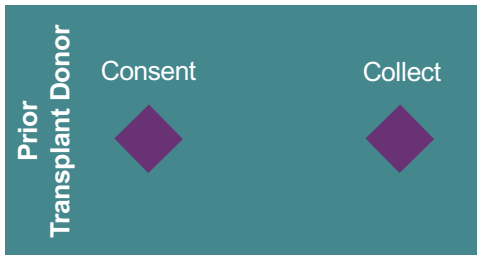
Day 28 Follow-up

Lymphodepletion

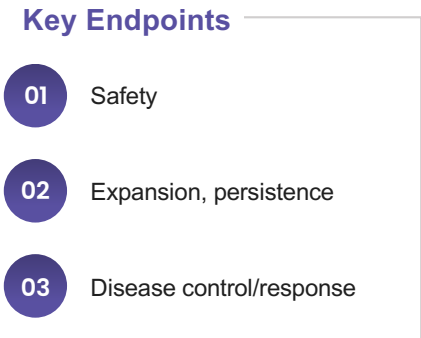
Arm A: Blasts \geq 5%

Arm B: MRD⁺

2nd transplant if required



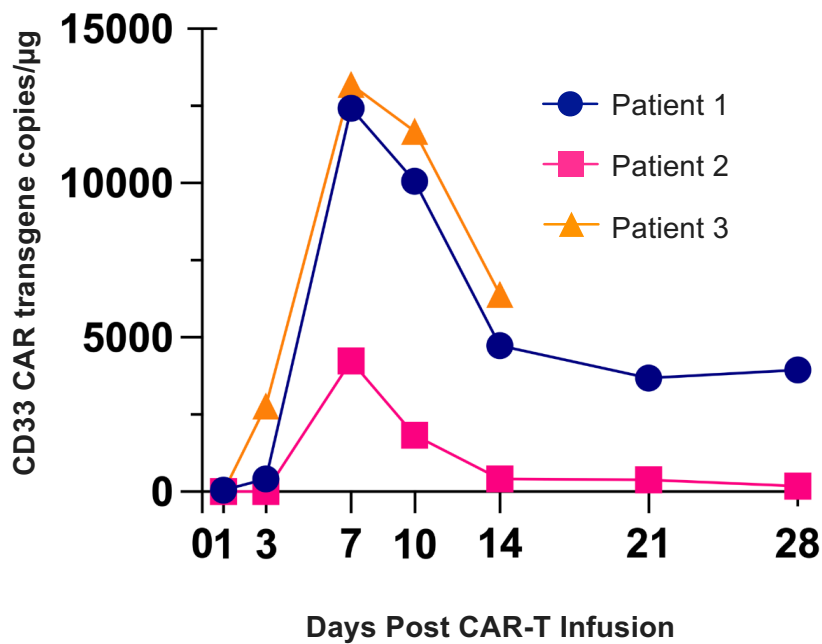
3x3 dose escalation starting at 1×10^6 CAR⁺ cells/kg





VCAR33^{ALLO}: Encouraging Signs of *In Vivo* Expansion

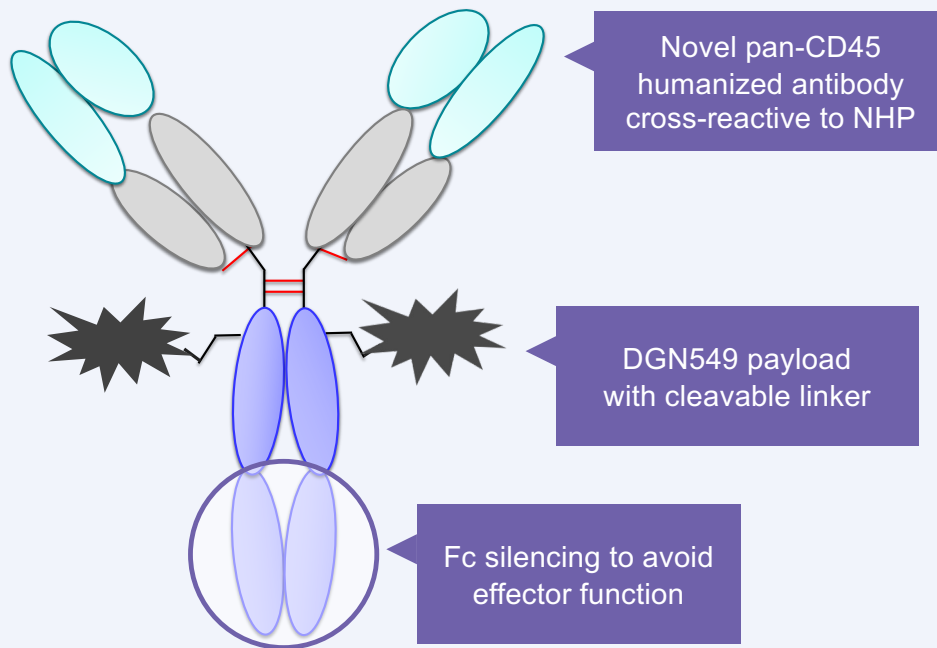
Peripheral Blood



- Dose escalation schedule:
 - 1×10^6 CAR+ cells/kg
 - 3×10^6 CAR+ cells/kg
 - 1×10^7 CAR+ cells/kg
- NCI CD33CART trial (autologous) saw *in vivo* expansion and 2 responses out of 5 assessable patients at 1×10^7 CAR+ cells/kg*



VADC45, a Novel CD45-Targeted Antibody Drug Conjugate



CD45 is highly expressed throughout the heme compartment (minus mature RBCs)

Clinically validated linker-payload (Immunogen, alkylating agent)

Robust preclinical data package

IND-enabling studies progressing to completion



VADC45: Potential Commercial Opportunities



Treating Relapse - Heme Malignancies

- CD45 is highly expressed in AML and DLBCL
- Target may be oncogenic, driving tissue infiltration, high expression and poor prognosis
- **Opportunity:** R/R AML and MDS



Non-Chemo Conditioning - Gene Therapies

- Gene therapies such as for sickle cell urgently need non-chemo conditioning agents
- Could avoid oncogenicity and sterility concerns
- **Opportunity:** SCD, TDT alternative conditioning



Immune Reset - Autoimmune Diseases

- Immune disorders that may require more holistic reset of the entire immune system
- Holistically remove immune cell compartments
- **Opportunity:** Refractory MS, SLE, SSc



Epitope Engineering - Shielded Grafts

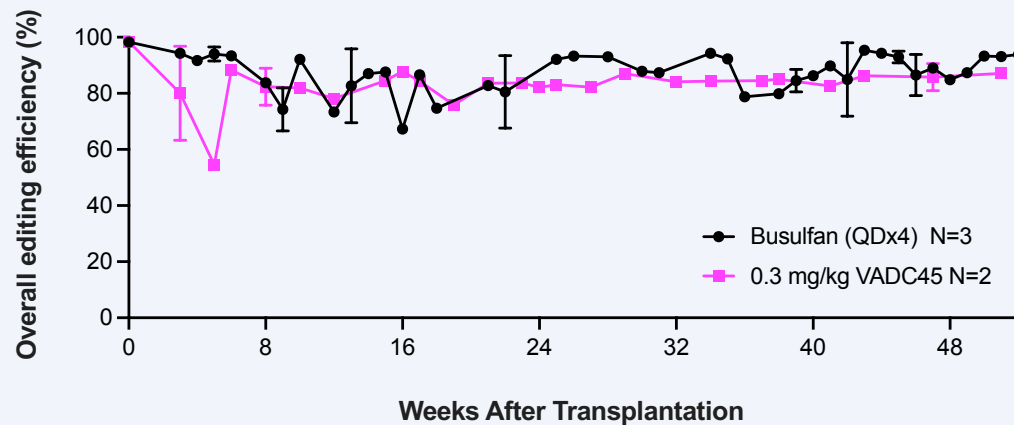
- Precise epitope for VADC45 has been identified
- Experiments are ongoing for epitope modification which retains protein functionality
- **Opportunity:** Heme malignancies



Single Dose of VADC45 Enabled Gene-edited HSC Engraftment

Engraftment and Persistence of Gene-edited Stem Cells

Granulocyte Gene Editing



NHPs received autologous transplantation of BCL11A-edited HSCs with conditioning via chemo (busulfan) compared to single dose of VADC45



Very high myeloid chimerism achieved within days of transplant

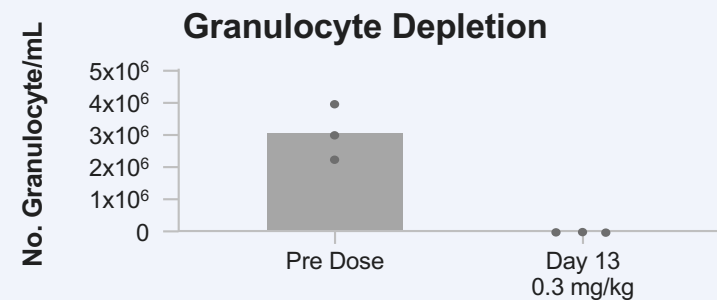
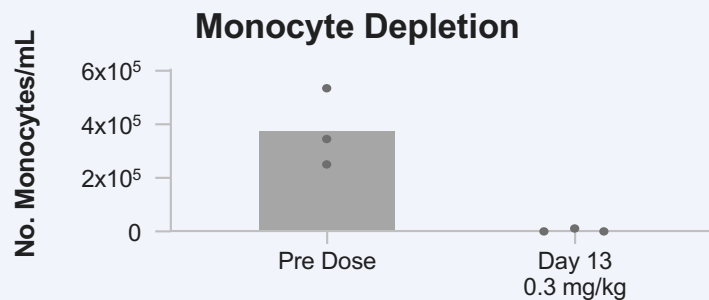
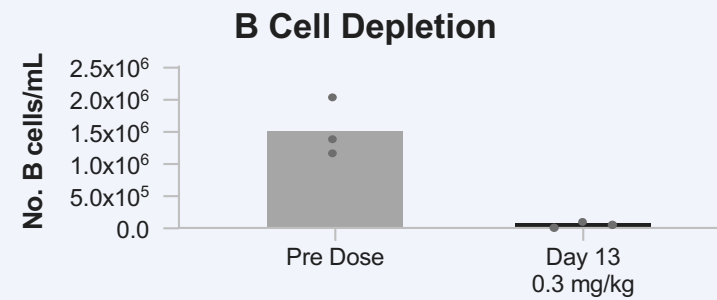
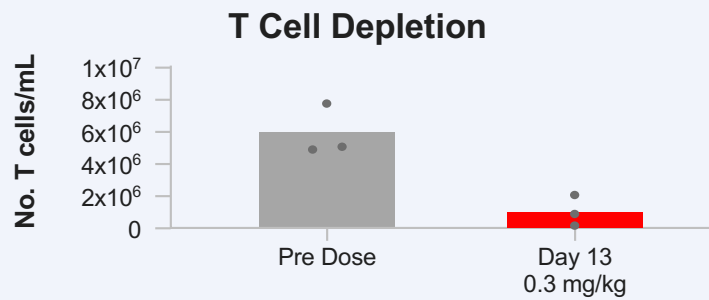


Persistently high edited populations through one year from transplant



Single Dose of VADC45 Efficiently Depleted Immune Cells

Immune Cell Depletion from Peripheral Blood (NHP)





Next-Generation Approaches

Targets Beyond CD33



Expansion into additional indications

Multi-targeted CAR-Ts



Avoidance of potential tumor escape

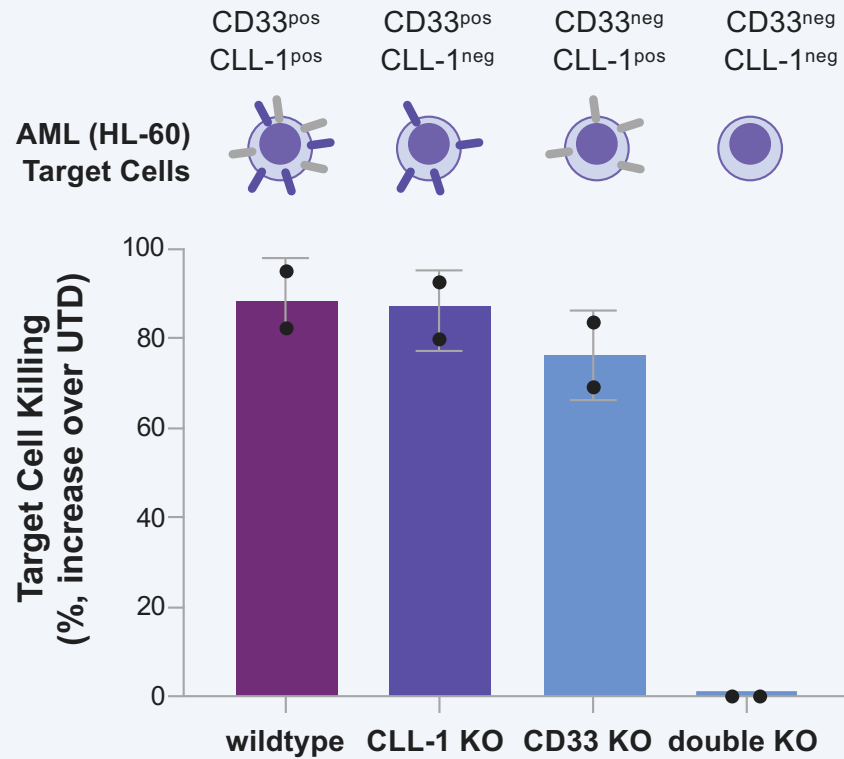
Multiplex-edited grafts



Broader options for treatment



In Vitro PoC for Multi-Specific CAR-T: Cell Killing and Shielding



- 2 independent T cell donors
- 48h co-culture of CAR-T cells with HL60 (AML) target cells
- E:T ratio 1:1

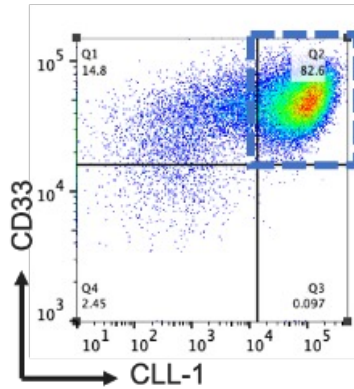
Multi-Specific CAR-T cell (CD33+CLL-1)

- Highly effective AML target cell killing
- “OR gated” CAR which eliminates target cells expressing both OR one target only
- Highly specific CAR leaving double knock-out target cells intact
- Can be paired with Multiplex (CD33+CLL-1)-edited HSPCs which provide shielding



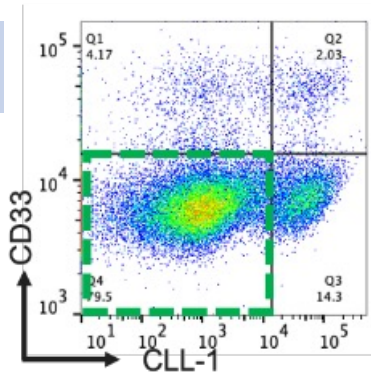
Multiplex HSC Editing: Minimize Translocations

Mock



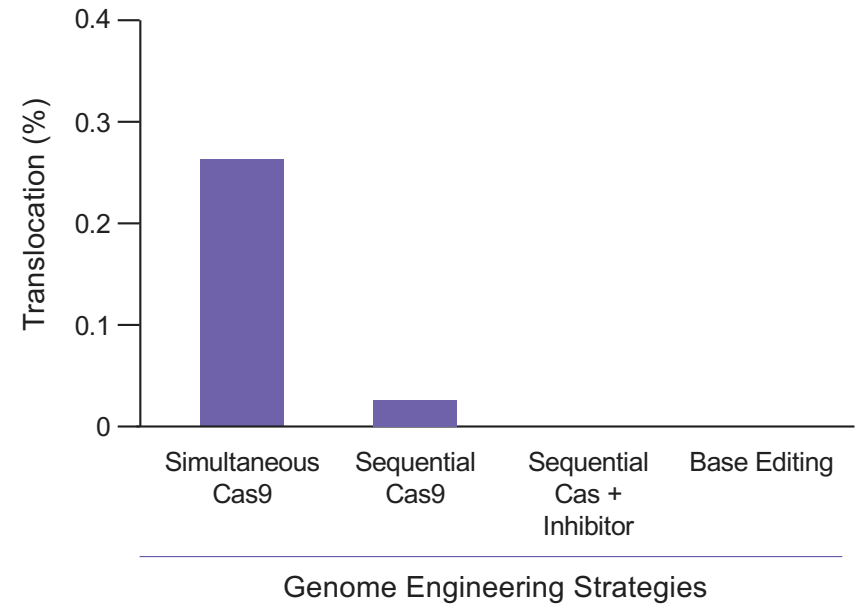
CD33⁺CLL-1⁺
Double Pos
82.6%

Base Edited



CD33⁻CLL-1⁻
Double KO
79.5%

Minimized Translocation



Adapted from [Precision Genome Engineering Keystone Symposia – 2022 Poster 3002](#)



Vor Bio Unique Approach to Potentially Cure Blood Cancers



Trem-cel, a first-in-class investigational* shielded stem cell transplant

- Reliable engraftment, robust shielding of the blood system
- Platform therapy addressing >\$1B potential market opportunity



Trem-cel + Mylotarg combination

- Broadened Mylotarg therapeutic index
- Early evidence of patient benefit prolonging relapse-free survival
- Supportive feedback from FDA on registrational trial design



VCAR33^{ALLO}, differentiated transplant donor CAR-T therapy

- Encouraging signs of in vivo expansion with strong trial enrollment



VADC45

- Four distinct potential commercial opportunities



www.vorbio.com



Pipeline to Change the Standard of Care in Blood Cancers

Description			Preclinical		Clinical		Anticipated Milestones
Program / Trial	Modality	Indication	Discovery/ Validation	IND- Enabling	Phase 1/2	Phase 2/3	
Trem-cel + Mylotarg / VBP101	Shielded CD33-deleted transplant + CD33-directed ADC	AML, MDS	[Progress bar]				
VCAR33^{ALLO} (healthy transplant donor CAR-T) / VBP301	CD33-directed transplant donor CAR-T	AML post-transplant	[Progress bar]				
Trem-cel + VCAR33 Treatment System	Shielded CD33-deleted transplant + CD33-directed transplant donor CAR-T	AML	[Progress bar]				IND filing following initial trem-cel and VCAR33 ^{ALLO} data
VADC45 ADC	CD45-directed ADC	AML, conditioning, immune reset	[Progress bar]				Finalizing IND preparedness
CD33-CLL1 Treatment System	Multi-specific CAR-T	AML	[Progress bar]				
	Multiplex-edited shielded transplant	AML	[Progress bar]				



Experienced Leadership Team



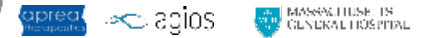
Robert Ang, MBBS, MBA
President and CEO



Han Choi, M.D., LL.M
Chief Financial Officer



Eyal Attar, MD
Chief Medical Officer



Tirtha Chakraborty, PhD
Chief Scientific Officer



Tania Philipp
Chief People Officer



John King, MBA
Chief Commercial Officer & Head of Business Development



David Phillips, MBA
Senior Vice President, Head of Quality



Samir Vattompadam, MS
Senior Vice President, Portfolio Strategy and Program Management



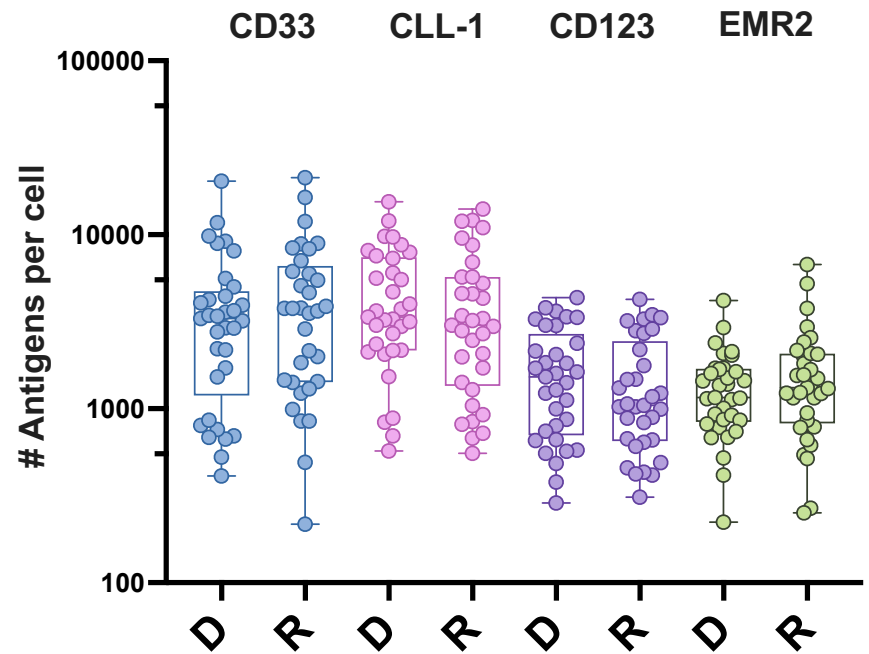
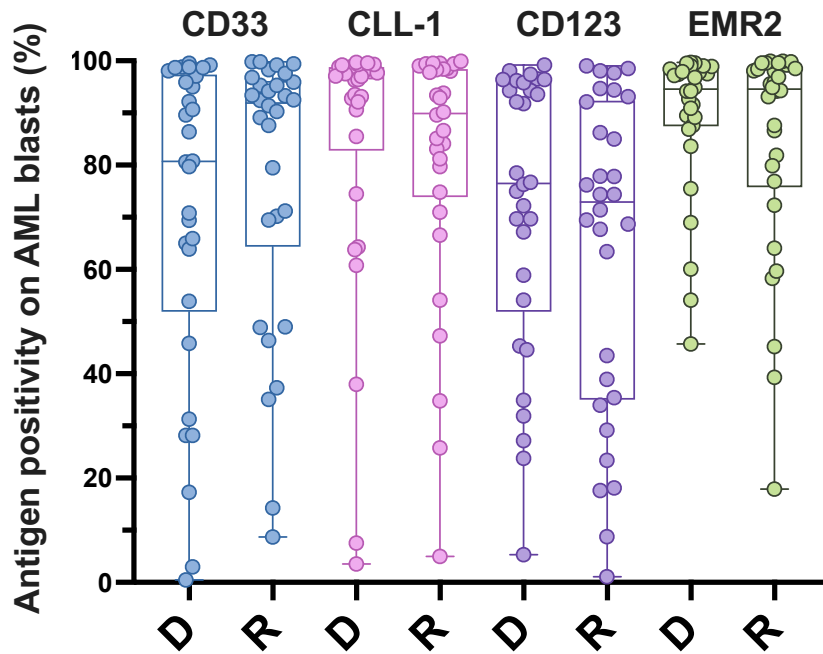
Deep Cell & Gene Therapy Expertise



CD33 is Amongst Highest Quality Targets in AML

Ubiquity of Antigen Expression (Flow Cytometry)

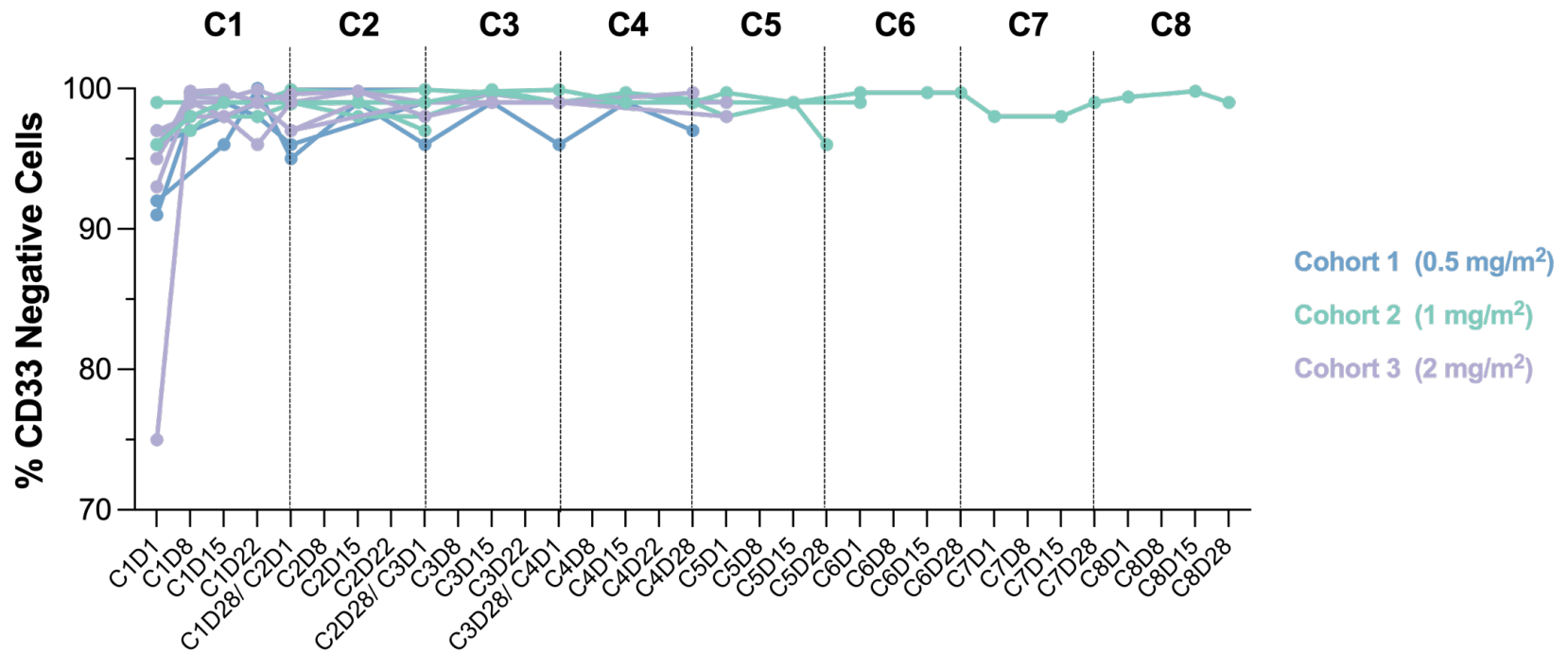
Density of Antigen Expression (QuantiBRITE)





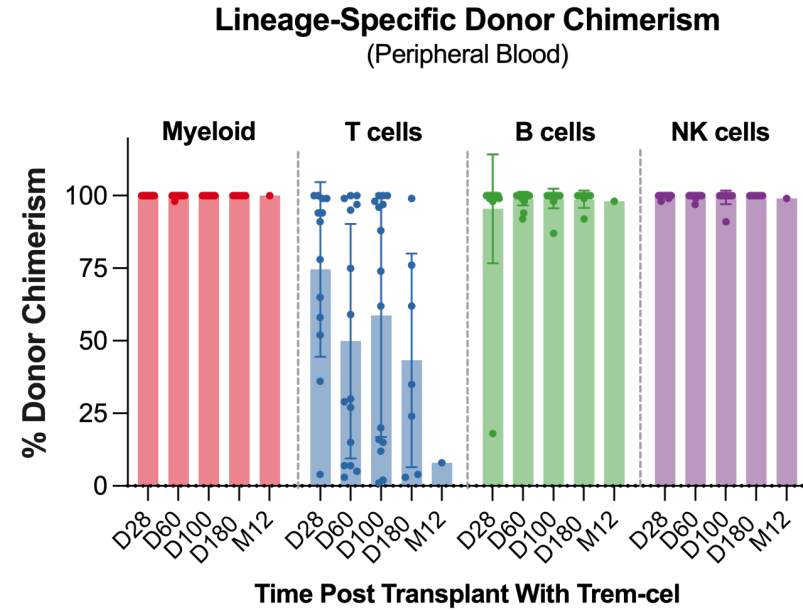
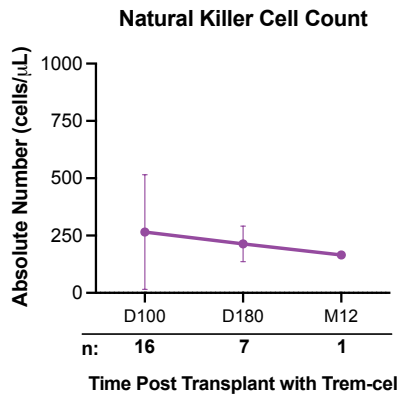
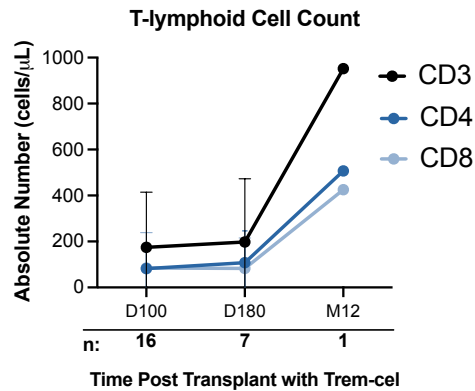
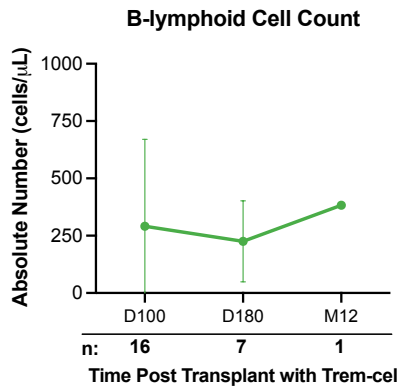
CD33 Negative Cells Enriched with Mylotarg Doses

Loss of CD33 Expression on Myeloid Cells (Peripheral Blood, n=20)





Immune Reconstitution, Full and Sustained Myeloid Chimerism, and CD33-negative Myeloid Cells Are Observed



% CD33-Negative Analysis	Drug Product*	D28*	D60*
NGS Gene Editing	90 (78-94) n=18	94 (85-98) n=19	94 (86-97) n=16
Flow Cytometry	N/E	93 (74-98) n=22	94 (78-99) n=19

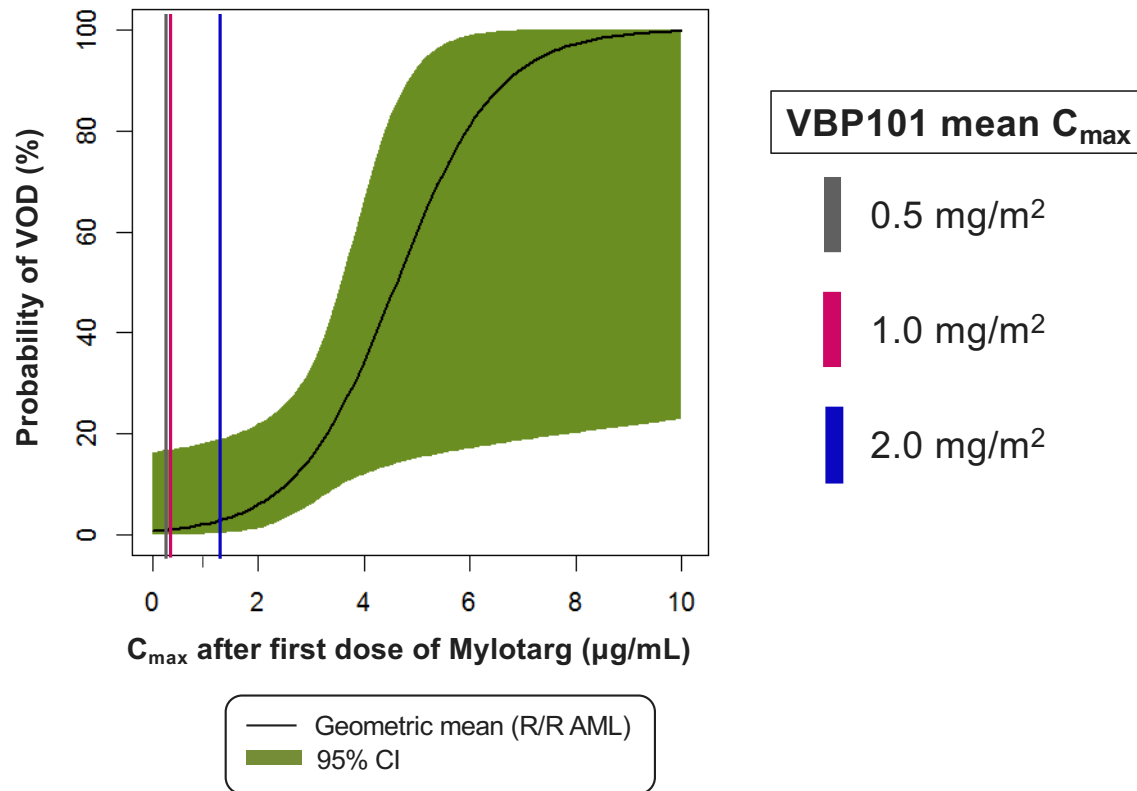
*Mean % (range), Editing and flow data from peripheral blood monocytes and myeloid cells respectively
N/E: not evaluated

Data cut-off: 1-NOV-2024. Reference unedited CD34-selected reconstitution: Goldberg et al Leuk and Lymph 58 (217); Llauroador et al. Transplantation and Cellular Therapy 27 (2021)



Risk of Veno-Occlusive Disease Related to Mylotarg C_{max}

Probability of Veno-occlusive Disease in Patients with Prior Transplant





Selected Precedent Randomized Trials in AML

AML Studies

Transplant Studies

	MORPHO	SIERRA	ALFA-0701	Precision-T	Omidubicel
Drug and Comparisons	Gilteritinib vs placebo	¹³¹ I-apamistamab + Flu-TBI + alloHCT vs conventional care	Daunorubicin + cytarabine ± Mylotarg (D1, 4, 7)	Orca-T transplant vs SoC alloHCT	Omidubicel vs double cord graft
Treatment Setting	Post-HCT maintenance, FLT3-ITD AML	R/R AML	Newly-diagnosed de novo AML	Transplant-eligible AML, ALL, MDS	Transplant-eligible high-risk malignancies
1° Endpoint	RFS	Rate of dCR (CR/CRp ≥ 180 days)	EFS (induction failure, relapse, or death)	Survival free of moderate-to-severe chronic GVHD (cGFS)	Time to neutrophil engraftment
2° Endpoints	OS (key), EFS, Time to NRM, Relapse, GVHD, MRD	OS, EFS	Rate of CR/CRp, OS, RFS, Safety	Time to moderate-to-severe GVHD, GRFS, OS	Platelet engraftment by 42 days, grade 2-3 bacterial or invasive inf, NRM, OS
Sample Size	178 per arm	76 per arm	140 per arm	85 per arm	62 per arm