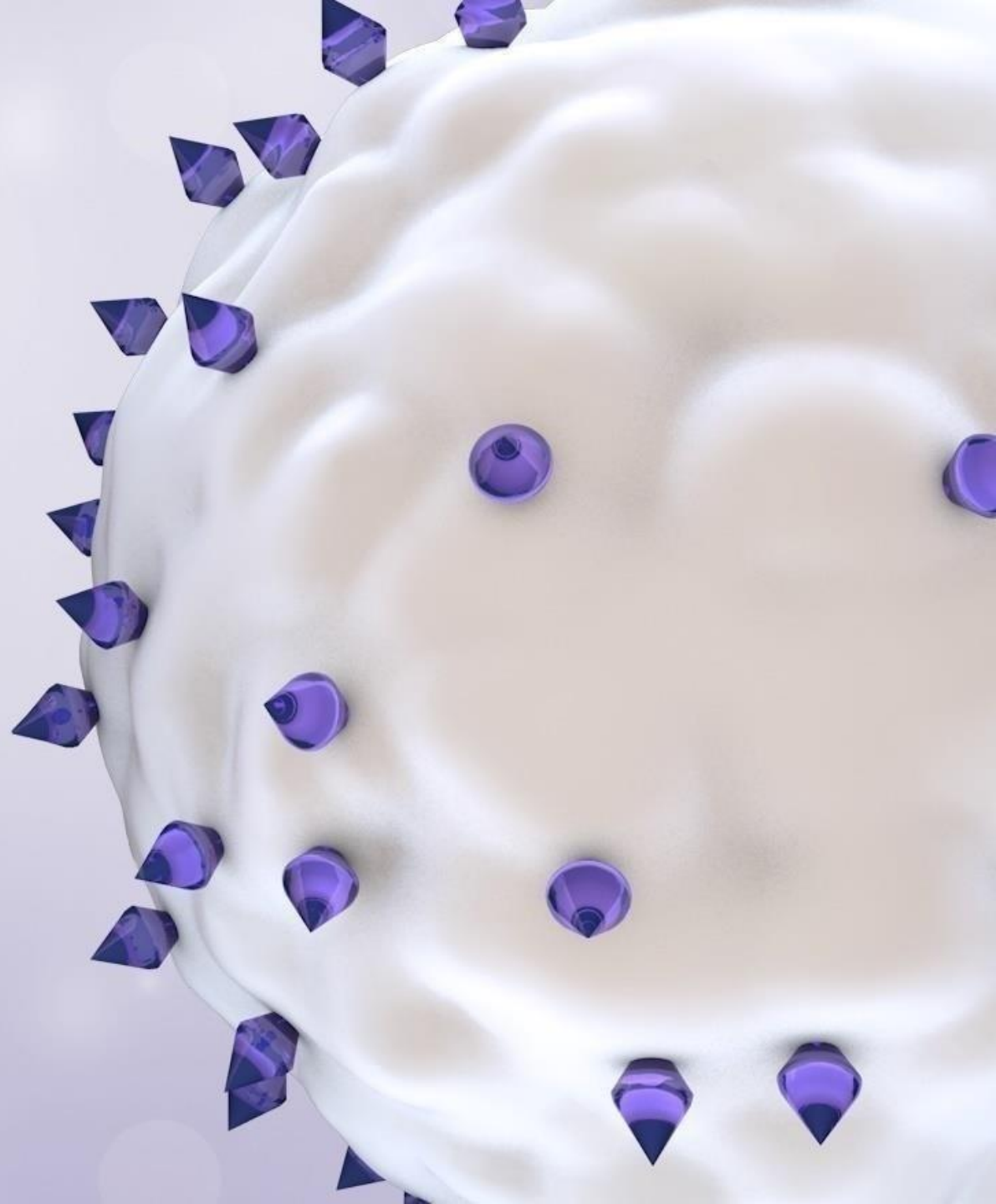
VOR

Cure blood cancers through cell and genome engineering

November 2021



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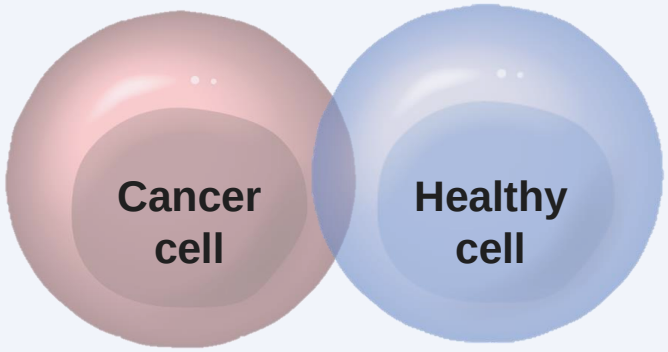
VCAR33 and NMDP-Sponsored Trial. A T cell therapy using the same CAR construct as VCAR33 is being studied in a Phase 1/2 clinical trial sponsored by the National Marrow Donor Program ("NMDP"), and timing of data release is dependent on the investigators conducting the trial. Although we are not the sponsor of this trial, the NMDP has permitted us to cross-reference its IND for this trial in future IND applications that we may submit with the FDA and we may still potentially assume sponsorship and oversight of the NMDP trial. We believe the T cell therapy being evaluated in the NMDP trial is comparable to VCAR33 and that the trial, if successful, will support future clinical development of VCAR33. However, the FDA may reject our claim of comparability or the sufficiency of the data to support it or disagree with our ability to reference the data generated by NMDP. If any of foregoing were to occur, we will be required to repeat certain development steps, which would involve us conducting additional IND-enabling studies. See "Risk Factors - We have not successfully tested our product candidates in clinical trials and any favorable preclinical results are not predictive of results that may be observed in clinical trials" in the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2021 filed with the Securities and Exchange Commission ("SEC") and such other filings that the Company may make with the SEC from time to time.

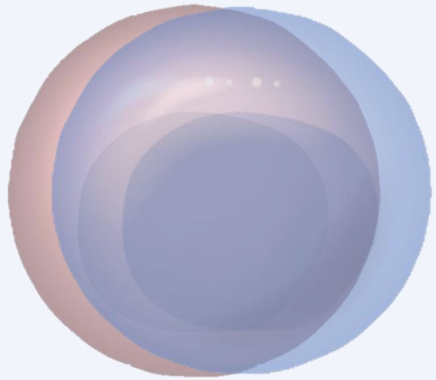
Changing the Thinking on Tumor Targeting

Traditional Paradigm for Drug Development



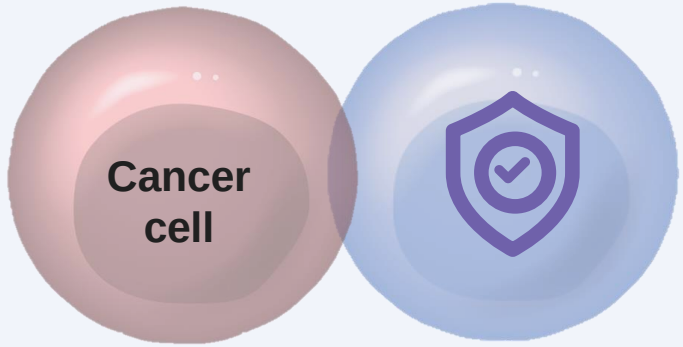
Target cancer antigens to kill cancer cells

Problem



Few unique cancer antigens, so drugs kill both cancer and healthy cells through **on-target toxicity**

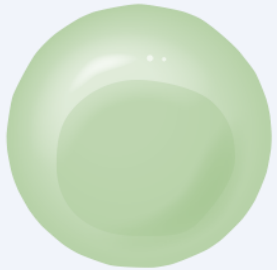
Vor Paradigm: Engineered HSCs (eHSCs)



Remove target expression on healthy cells so that killing is **cancer-specific**

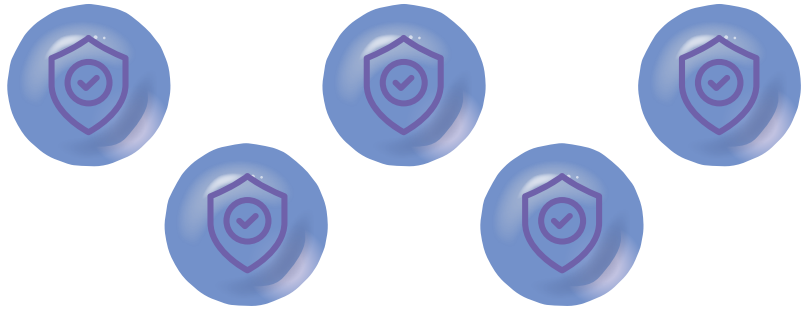
Vor's Platform and Vision

Hematopoietic Stem Cells

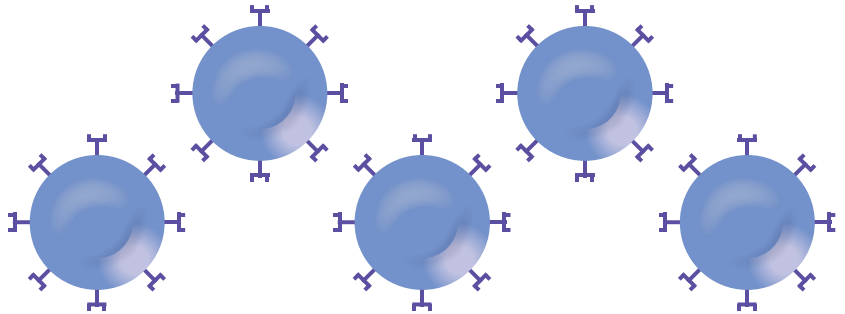


Donor T-Cells

Genome Engineering



Treatment-Resistant Transplants

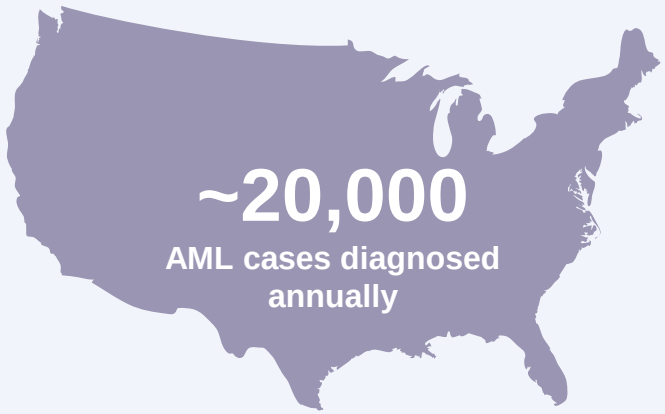


CAR-T-Cell Therapies

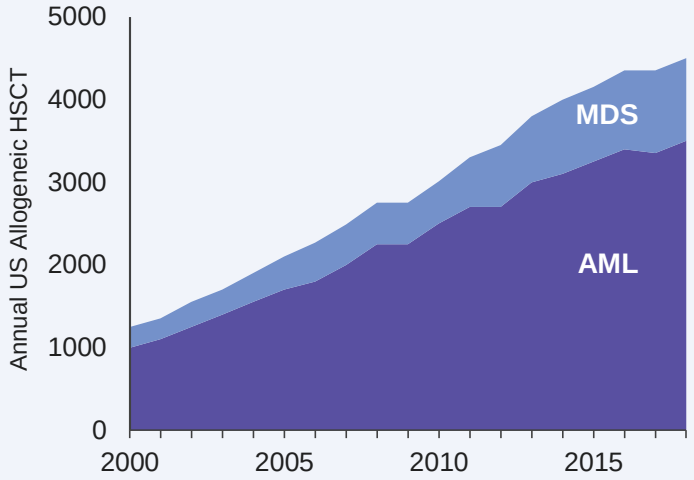
Cure blood cancers through cell and genome engineering

Myeloid Cancer Unmet Need Is Large and Increasing

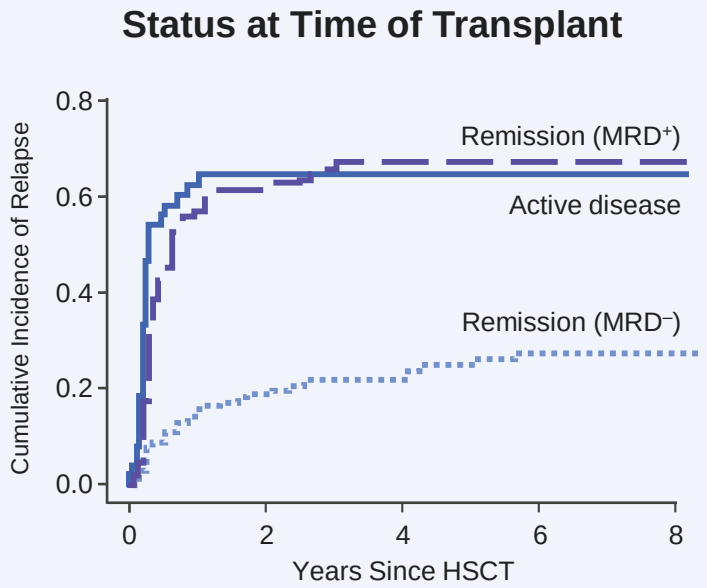
Most Common Form of Adult Acute Leukemia



More Allogeneic Transplants



Frequent Relapse Post-Transplant



For patients who relapse post-transplant, 2-year survival is <20%

The Vision: eHSC + CAR-T Treatment Systems

VOR33 + **Mylotarg**

Treatment-resistant HSC transplant + 1st generation antibody-drug conjugate

VOR33 + **VCAR33**

Treatment-resistant HSC transplant + Allogeneic CAR-T

Multiplex-edited HSCs + **Multi-specific CAR-Ts**

Multi-treatment-resistant HSC transplant + Abound Bio collaboration

Designed by renowned CAR-T cell expert Dr. Terry Fry

- Exclusively licensed from NIH
- CAR construct in multi-site Phase 1/2 pediatric NMDP-sponsored trial in R/R AML

Potential advantages for healthy donor cell source

- Tolerized to new bone marrow
- Healthy T cell phenotype

May avoid tumor escape mechanisms

May address tumor heterogeneity

Expanding Pipeline Driven by Innovative Platform

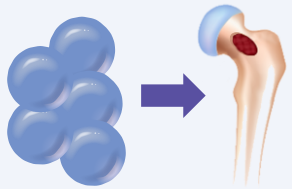
Description			Preclinical		Clinical		Anticipated Milestones
Program	**Modality**	**Indication**	**Discovery/ Validation**	**IND-Enabling**	**Phase 1/2**	**Phase 2/3**	
VOR33 + Mylotarg	**eHSC + ADC**	AML					1H 2022: Initial clinical data
		MDS, MPN					
VCAR33	**CAR-T**	Bridge-to-transplant AML		NMDP-sponsored trial*			2022: Initial monotherapy clinical proof-of-concept data*
VOR33 + VCAR33 Treatment System	**eHSC + CAR-T**	AML					2H 2022: IND filing following initial VOR33 and NMDP clinical data*
VOR33-CLL1 + VCAR33-CLL1 Treatment System	**Multiplex-edited eHSC + Multi-specific CAR-T**	AML					

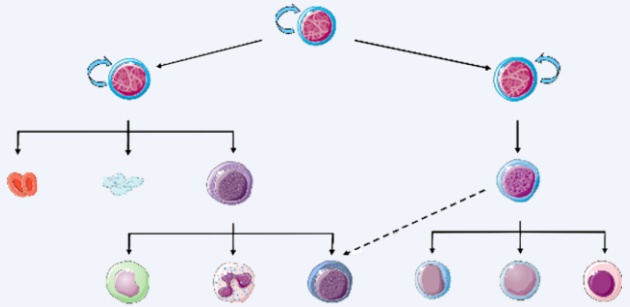
Discovery Platform

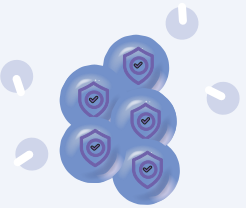
- Leveraging our proprietary Vor platform, we are exploring additional surface targets such as CD123, EMR2, and CD5 including multiplex genome engineering approaches where multiple surface targets are removed.
- We are conducting ongoing discovery efforts in commonly transplanted hematologic malignancies.

AML: acute myeloid leukemia; MDS: myelodysplastic syndrome; MPN: myeloproliferative neoplasm
** The VCAR33 construct is being studied in a Phase 1/2 clinical trial sponsored by the National Marrow Donor Program ("NMDP"), and the timing of data release is dependent on the investigators conducting the trial. See "Disclaimer" slide for more information.*

Preclinical Validation of CD33 Deletion in HSCs





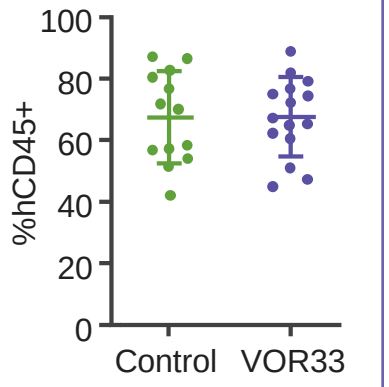


1. Homing | **2. Engraftment** | **3. Survival**

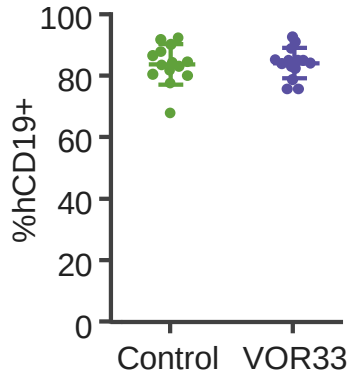
	Migrate to bone marrow	Repopulate the blood system	Fully functional blood cells	Resistance to toxic therapy
VOR	✓	✓	✓	✓
Columbia University	✓	✓	✓	✓
Fred Hutch	✓	✓	✓	✓
Penn Medicine	✓	✓	✓	✓

VOR33: No Observed Impact on Cell Populations or Function

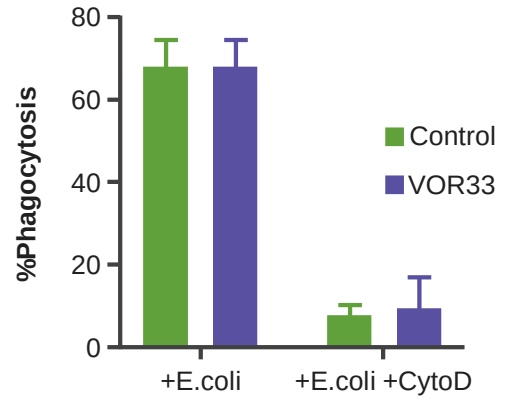
Bone Marrow Cells



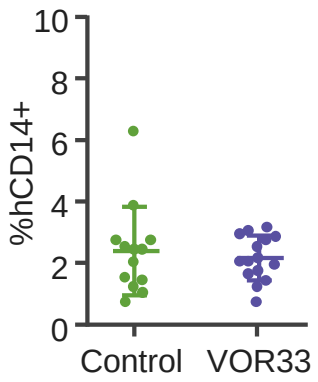
B Cells

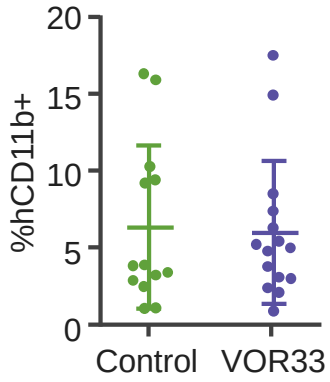


Phagocytosis

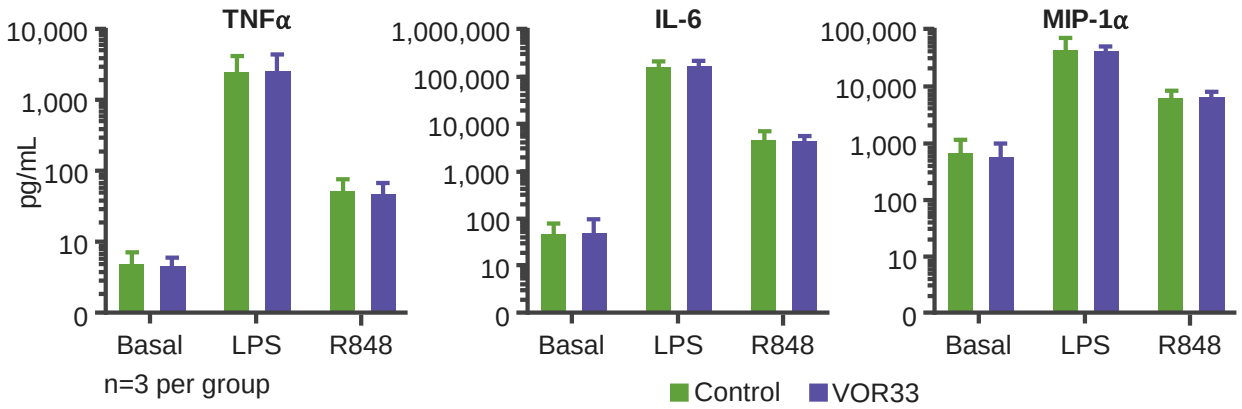


Myeloid Cells





Cytokine Production



Strongest Supportive Evidence for CD33 Dispensability: Human Genetics

65 individuals with homozygous loss-of-function mutations in CD33 gene

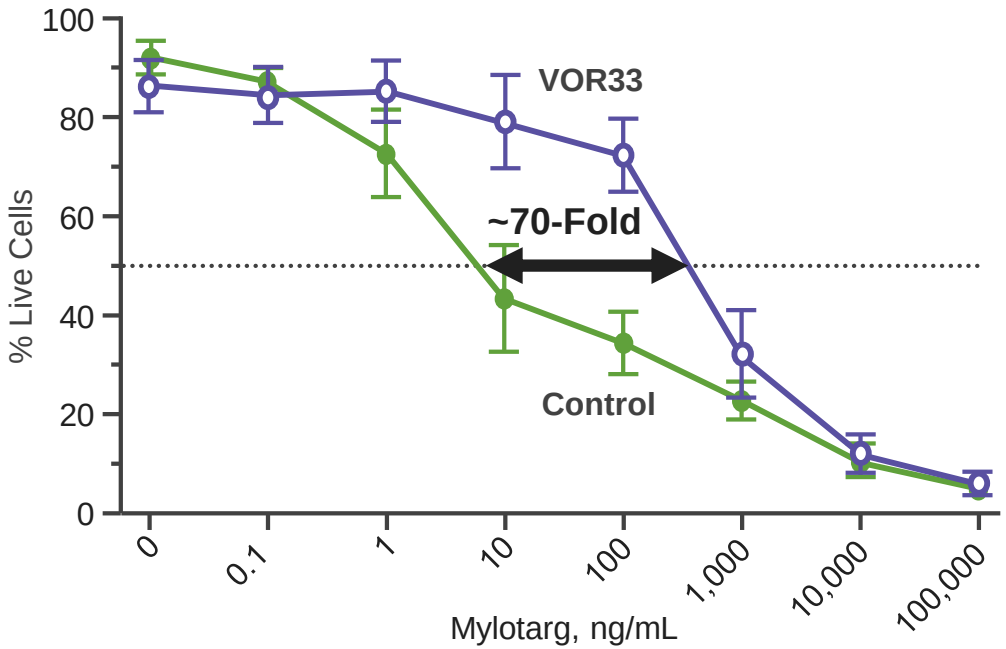
in Genome Aggregation Database

gnomAD genome aggregation database

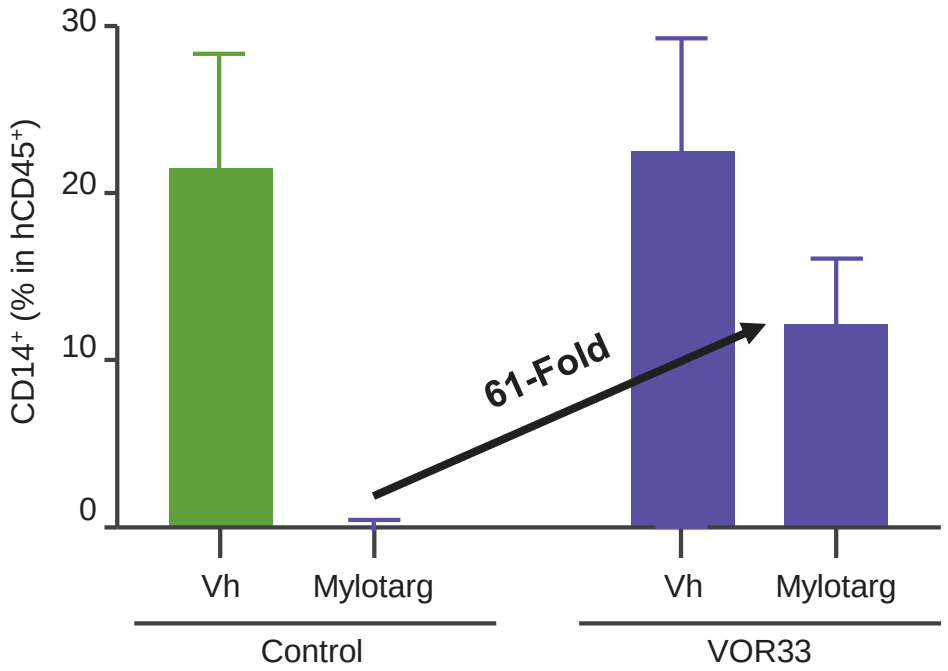
BROAD INSTITUTE

VOR33: Resistance to CD33 Therapy

In Vitro



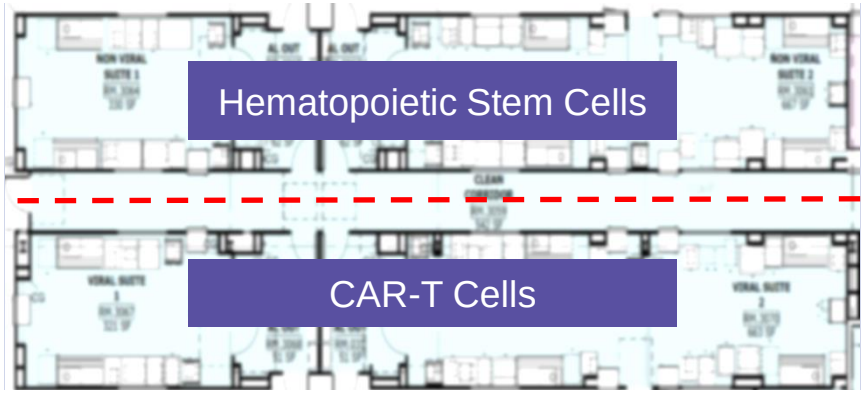
In Vivo

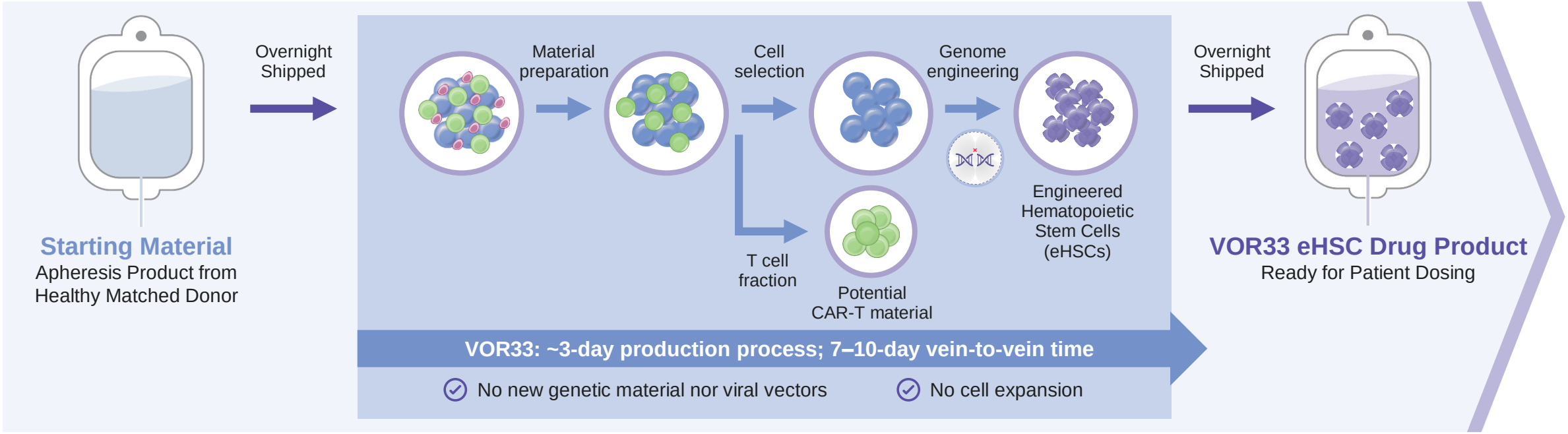


- Engineered cells were not enriched for CD33 deletion and some cell death was expected based on residual CD33 expression
- Free calicheamicin dissociated from Mylotarg may have led to non-specific cell death

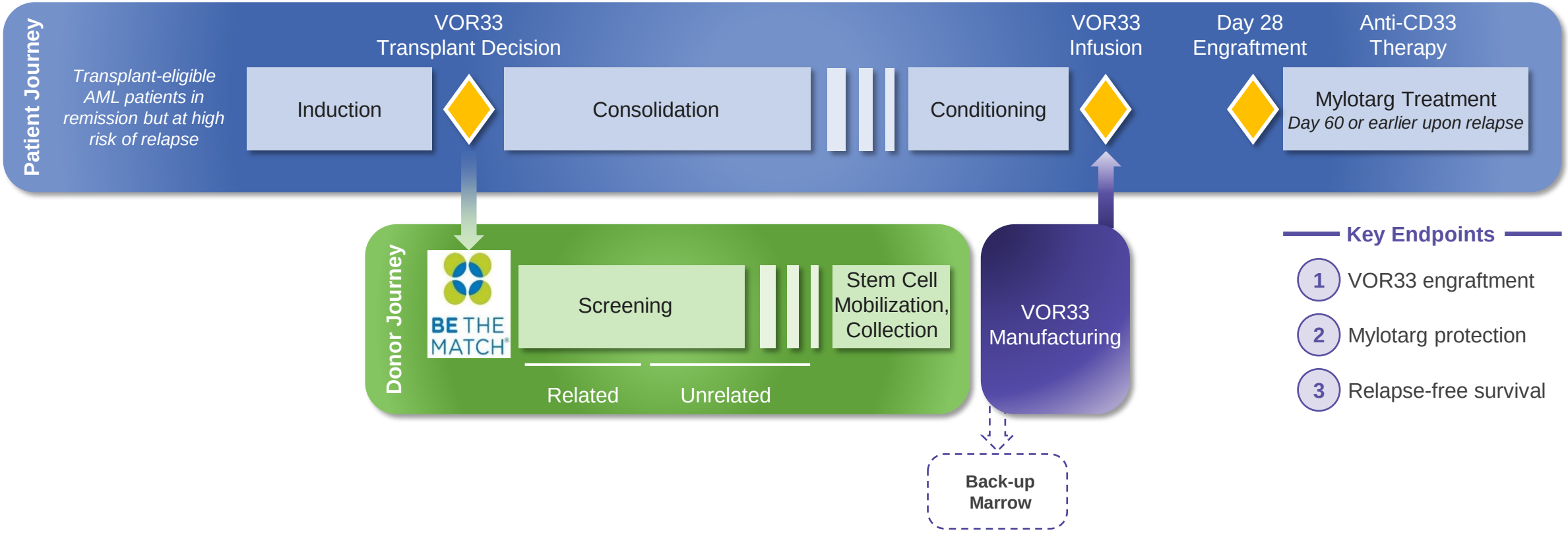
VOR33: Streamlined Cell Manufacturing Process

Vor is Building a Fully Integrated Manufacturing Facility for eHSC and CAR-T Drug Products





VBP101: VOR33+Mylotarg Phase 1/2a Clinical Trial



Clinical Trial Sites

- MSKCC (NY)
- Fred Hutchinson Cancer Ctr. (WA)
- Hackensack/Theurer Cancer Ctr. (NJ)
- Miami Cancer Inst. (FL)
- CWRU/Seidman Cancer Ctr. (OH)
- UC San Diego Cancer Ctr. (CA)
- Hôpital Maisonneuve-Rosemont (Montreal)
- WashU Siteman Cancer Cntr. (MO)
- The National Cancer Institute (MD)

First Validation for Vor's Novel Platform Expected 1H 2022

1.

Successful engraftment is important proof of concept

- CD33 biological redundancy in humans
- Platform de-risking
- eHSC manufacturing validation

2.

Successful engraftment is primary endpoint

- Defined as neutrophil recovery to >500/µl by day 28 sustained for 3 consecutive days

3.

~95% of transplants achieve primary engraftment[1]

1. Olsson, et al. Leukemia. (2015) 29, 1754–1762.

VBP101: Defining Success

Measure	Current Standard of Care	VBP101
Short-term Engraftment	~95% typical for modern transplants[1]	Expect equivalent for VOR33
Protection against Mylotarg-mediated heme toxicities	Hematological toxicity expected in virtually all patients dosed down to 0.25 mg/m^2 [2]	VOR33 allows improved tolerability with less severe cytopenia enabling repeat Mylotarg dosing
Clinical outcomes*	Relapse-free survival as poor as 28% (1-year) and 25% (2-year) post-HCT[3]	Trending towards improved outcomes due to post-HCT therapy

1. Olsson, et al. Leukemia. (2015) 29, 1754–1762. 2. Sievers, et al. Blood (1999) 93 (11): 3678–3684. 3. Walter, et al. Blood (2013) 122 (10): 1813–1821.
* VBP101 not designed for comparative efficacy outcomes

Potential Value Proposition and Reimbursement Pathways

HSC

ngineered for Protection

Seamless Integration

- Comparable engraftment
- Well-characterized, regulated

Protected Bone Marrow

- Invisible and resistant to targeted therapy

Curative Intent

- Unlock new treatments
- Relapse-free survival

Reimbursement Pathways

Medicare	Commercial
Carve-out for actual cost of stem cell acquisition & processing *(new IPPS ruling)* or New technology add-on payment (NTAP) or PPS-exempt	Incremental carve-out or Outcomes-based agreement or Negotiated case rate

Vor's Technology-Driven Platform Vision

Single-edited HSCs + Targeted Therapies

CD33 for myeloid disease (AML, MDS, MPN)

Multiplex-edited HSCs + Multi-specific CAR-T

Addressing escape and heterogeneity

Exploring Targets Beyond CD33

Demonstrating breadth of platform

Exploring Next-Generation Technologies

Genome Engineering

- Sequential multiplex editing
- Cas ortholog enzymes
- Base editing

Targeted Therapies

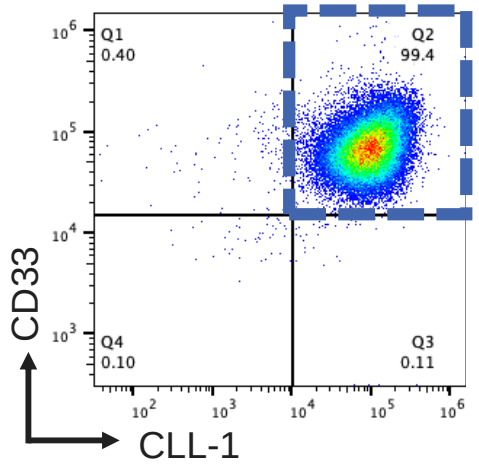
- Bi-specific antibodies
- Multi-specific CARs

Aboundbio

Multiplex Editing Strategies Achieve Highly Efficient Double Knock-out

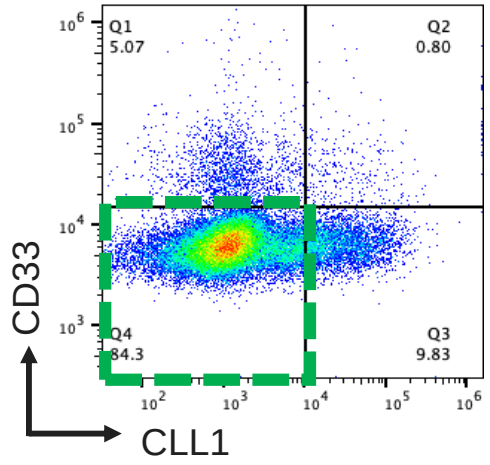
Sequential Cas9 Editing

Mock



$CD33^{+}CLL\text{-}1^{+}$
Double Pos
99.4%

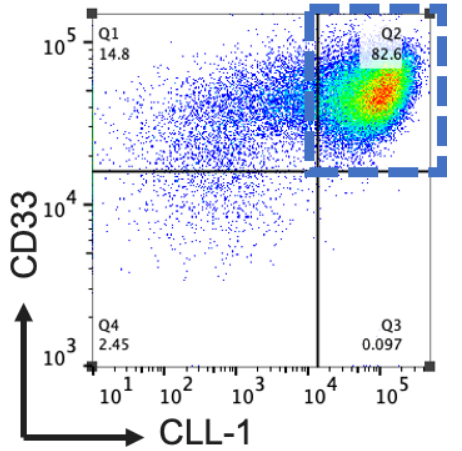
Edited



$CD33^{-}CLL\text{-}1^{-}$
Double KO
84.3%

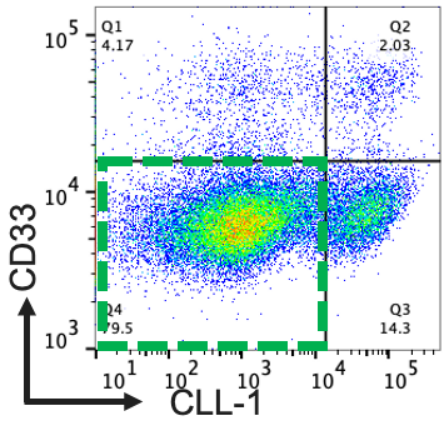
Base Editing

Mock



$CD33^{+}CLL\text{-}1^{+}$
Double Pos
82.6%

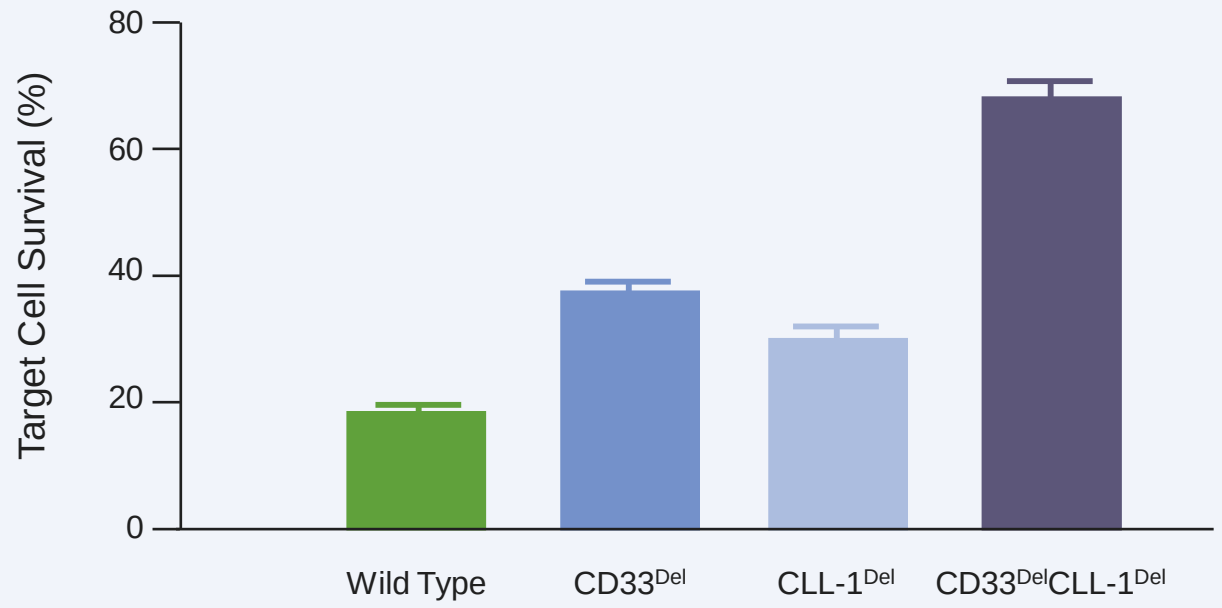
Edited



$CD33^{-}CLL\text{-}1^{-}$
Double KO
79.5%

CD33/CLL-1 Multiplex Editing Results in Protection from CAR-T Cytotoxicity

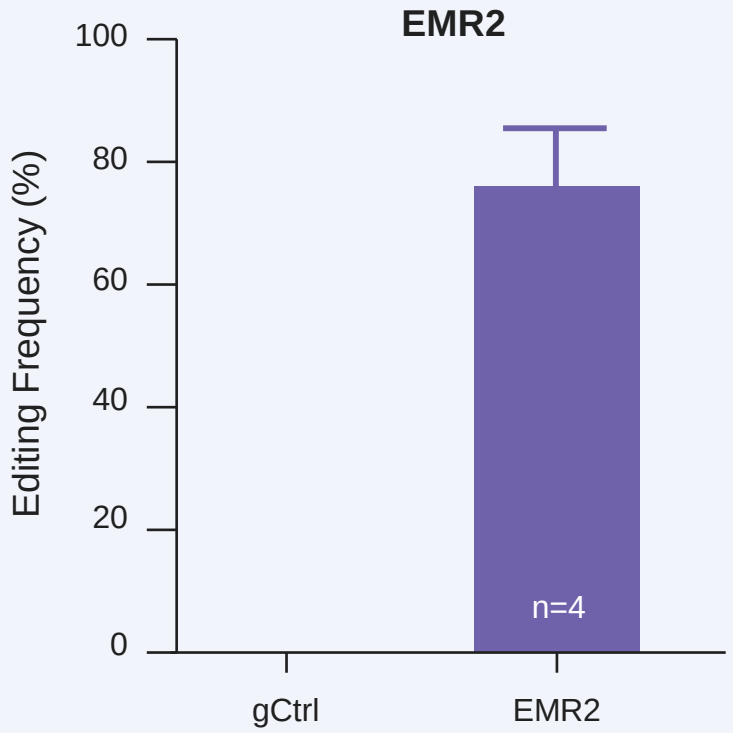
Protection of multiplex-edited HSPCs from CAR-T Killing

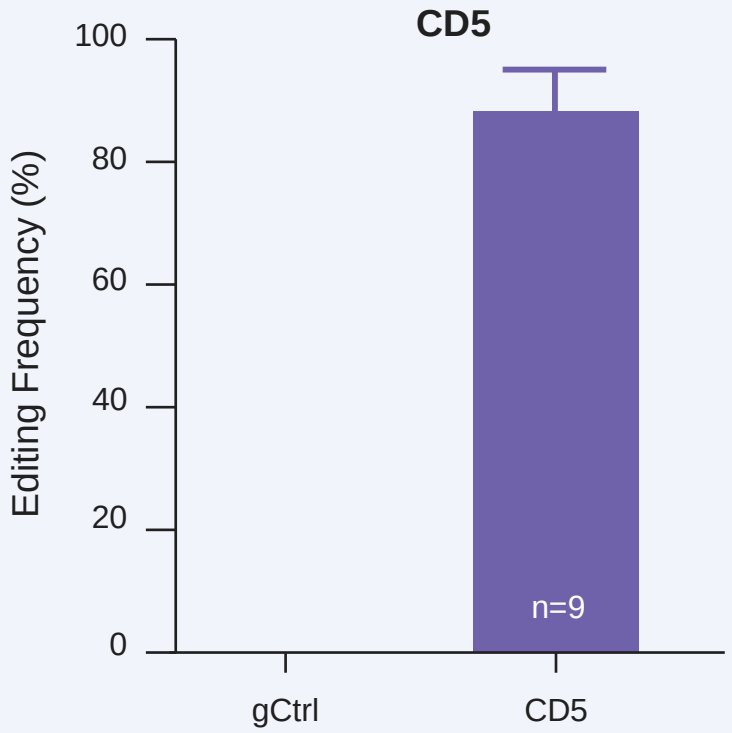


Effector : Target = 1:1

High Editing Frequency Observed in Human CD34+ Cells for CD5 and EMR2

Editing Frequency





Vor Bio: Cure Blood Cancers Through Cell and Genome Engineering

- Cell and gene engineering company with fundamentally different approach to target cancer
  - Proprietary engineered hematopoietic stem cell transplant (eHSC) platform unlocking the potential of targeted therapies with curative intent
  - Current pipeline covering hematologic malignancies with an initial focus on Acute Myeloid Leukemia (AML)
  - Multiple upcoming milestones:
    - VOR33 initial key clinical data in first half of 2022
    - VOR33/VCAR33 combo IND filing in the second half of 2022
- Building out in-house GMP manufacturing capability to support clinical development
- Experienced and proven management team
- Gross proceeds of $203M from IPO in February 2021, cash runway into mid-2023

www.vorbio.com