



Programmed Cellular Immunotherapies

Corporate Overview

August 2017

Forward-Looking Statements



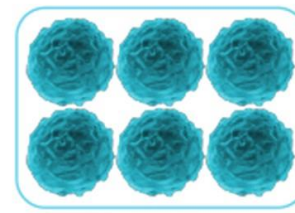
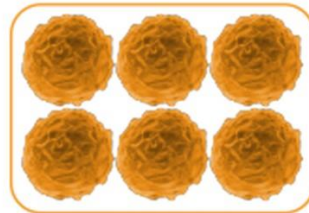
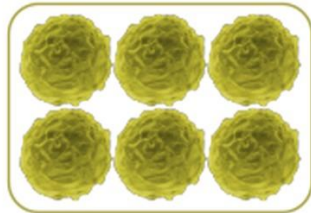
This presentation contains "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995, including statements regarding the Company's advancement of and plans related to the Company's product candidates, clinical studies, and research and development programs, the Company's progress and plans for its clinical investigation of ProTmune™ and of FATE-NK100, the timing for initiation of the Company's planned Phase 2 stage of PROTECT, the therapeutic potential of ProTmune and FATE-NK100, the scope and enforceability of the Company's intellectual property portfolio, and the Company's financial condition. These and any other forward-looking statements in this presentation 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, the risk that results observed in prior studies, including preclinical studies of ProTmune and FATE-NK100, will not be observed in ongoing or future studies involving these product candidates, the risk of a delay in the enrollment or evaluation of subjects in any ongoing clinical studies, the risk that the Company may cease or delay preclinical or clinical development for any of its existing or future product candidates for a variety of reasons (including requirements that may be imposed by regulatory authorities and requirements for regulatory approval, difficulties or delays in subject enrollment in current and planned clinical trials, difficulties in manufacturing and supplying the Company's product candidates for clinical testing, and any adverse events or other negative results that may be observed during preclinical or clinical development), and the risk that the Company's expenditures may exceed current expectations for a variety of reasons. These statements are also subject to other risks and uncertainties as further detailed in the Company's most recently filed Form 10-Q, and subsequent periodic reports filed by the Company under the Securities Exchange Act of 1934, as amended, any of which could cause actual results to differ materially from those contained in or implied by the forward-looking statements in this presentation. The Company is providing the information in this presentation as of the date hereof and does not undertake any obligation to update any forward-looking statements contained in this presentation unless required by applicable law.

Mission



*To develop first-in-class cell-based immunotherapies
for cancer and immune disorders
by programming cell function and fate*

T cells | **CD34⁺** cells | **NK** cells



induced Pluripotent Cell Platform
for off-the-shelf engineered immunotherapies

Better Cells for Better Therapies™

Our Approach to Cellular Immunotherapy



Programmed Donor Cell Products



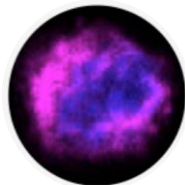
Donors

Cells from healthy donors with selected traits



Molecules

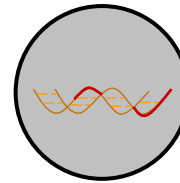
Ex vivo cell modulation to program biological properties



Cell Products

Cell products programmed for enhanced therapeutic function

iPSC-derived Cell Products



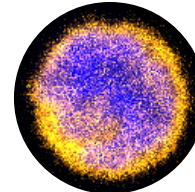
iPSC Cell Line

Renewable pluripotent cell lines with engineered functionality



Master Bank

Ex vivo expansion / differentiation to derive clonal cell populations



Cell Products

Off-the-shelf engineered cell products for 1000s of patients

First-in-Class Product Candidates



IMMUNO-ONCOLOGY

- **FATE-NK100 first-in-class adaptive memory NK cell cancer immunotherapy**
 - Multi-faceted anti-tumor activity, persistence and immune checkpoint resistance
 - Broad therapeutic potential across liquid and solid tumors, including with mAbs
 - VOYAGE study ongoing in r/r AML; two additional studies cleared for conduct by FDA in advanced solid tumors
- **Off-the-shelf NK- and T-cell candidates using renewable engineered iPSC lines**
 - Revolutionary approach to overcome challenges of patient-sourced therapies
 - Platform backed by dominant IP position of 90+ issued patents / 100+ patent applications

IMMUNO-REGULATION

- **ProTmune™ next-generation cell graft to prevent acute Graft-versus-Host Disease**
 - Patent-protected, highly-differentiated approach addressing significant unmet need
 - Supported by Fast Track and US and EU Orphan Drug Designations
 - PROTECT safety stage ongoing with DMC review scheduled; plan to initiate efficacy stage during 3Q17
- **ToleraCyte™ first-in-class immunoregulatory CD34⁺ cell for immune tolerance induction**
 - Novel mechanism of action promotes selective and durable deletion of autoreactive T cells
 - Ongoing preclinical studies evaluating safety and efficacy of iPSC-derived irCD34⁺ cells



Immuno-Oncology Programs

Natural Killer (NK) Cells

Unique Properties & Emerging Role in Cancer Immunotherapy



- **Multi-faceted effector function against tumor cells**
 - Direct killing of tumor cells through release of cytotoxic granules
 - Trigger adaptive immune response (e.g., T cells) through cytokine production
 - Engage and lyse antibody-coated tumor cells through Fc receptor (ADCC)
- **Effector function is not patient specific**
 - NK cell activity is *independent* of antigen recognition (unlike T cells)
 - Unique ability to target stressed / transformed cells, leaving healthy cells unharmed
 - Donor cells can be safely administered without eliciting GvHD
- **Emerging clinical precedent across liquid and solid tumors**
 - Varying degrees of tumor killing across a wide variety of tumor types
 - Well-tolerated with low risk of serious adverse events (e.g., CRS, neurotoxicity)

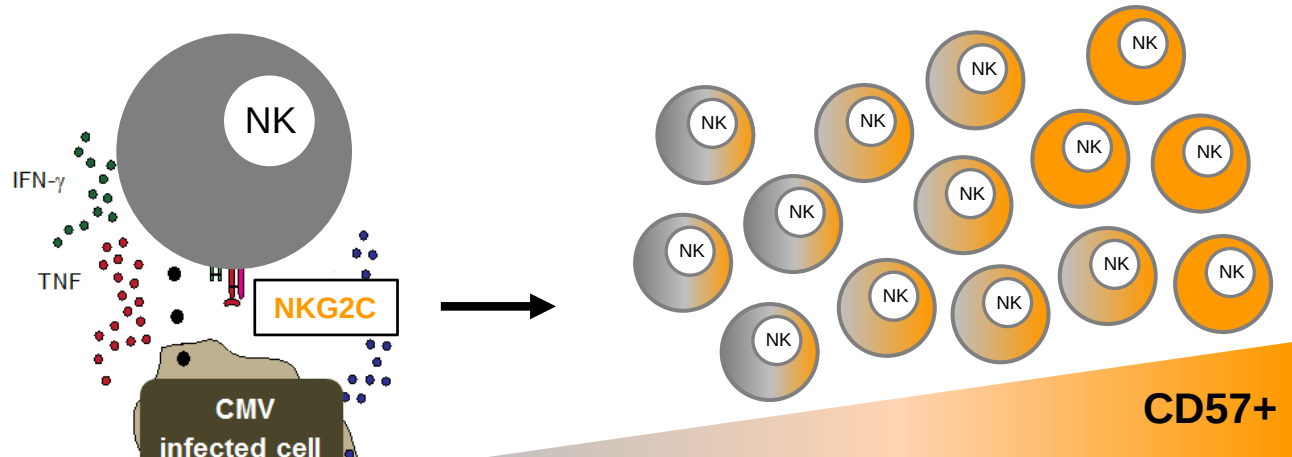
Adaptive Memory NK Cells



Jeffrey S. Miller, MD



UNIVERSITY OF MINNESOTA
Driven to DiscoverSM



Formation of Adaptive Memory NK Cells

*Correlated with reduced relapse risk and
superior disease-free survival in HCT*

***Unique subset of activated NK cells expressing the maturation marker CD57
and the memory-like activating receptor NKG2C***

Heightened Effector Function

Enhance Persistence

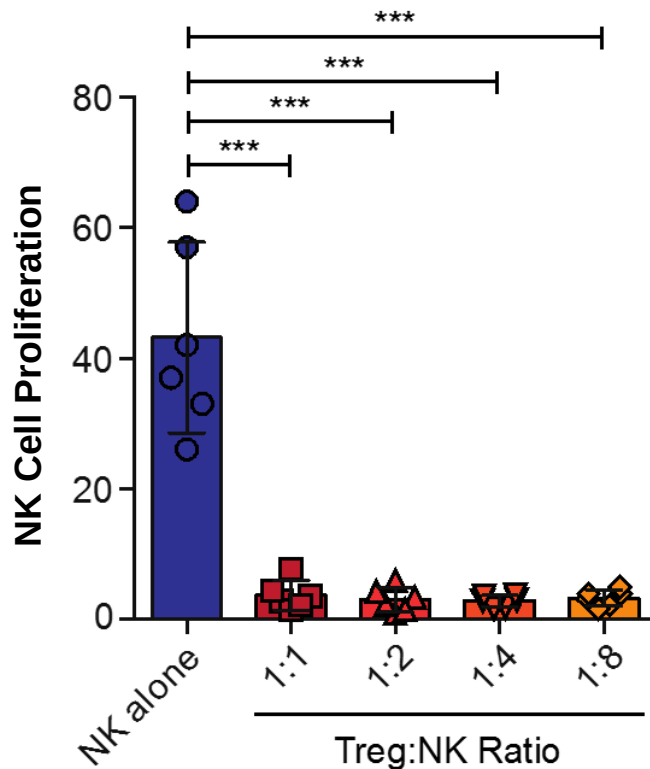
Resistant to Immune Checkpoint Pathways

Adaptive Memory NK Cells

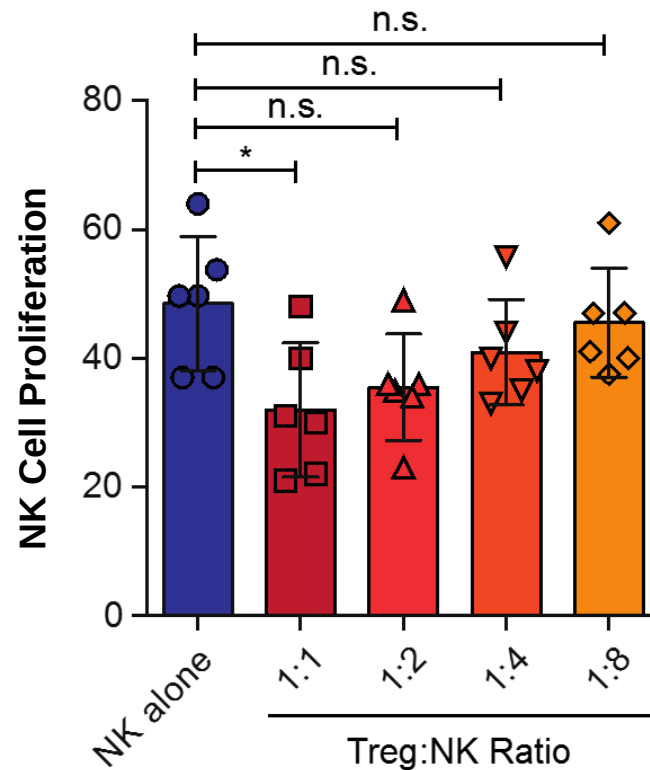
Resistance to Immune Checkpoint Pathways



Retained Proliferation Potential of Adaptive Memory NK Cells



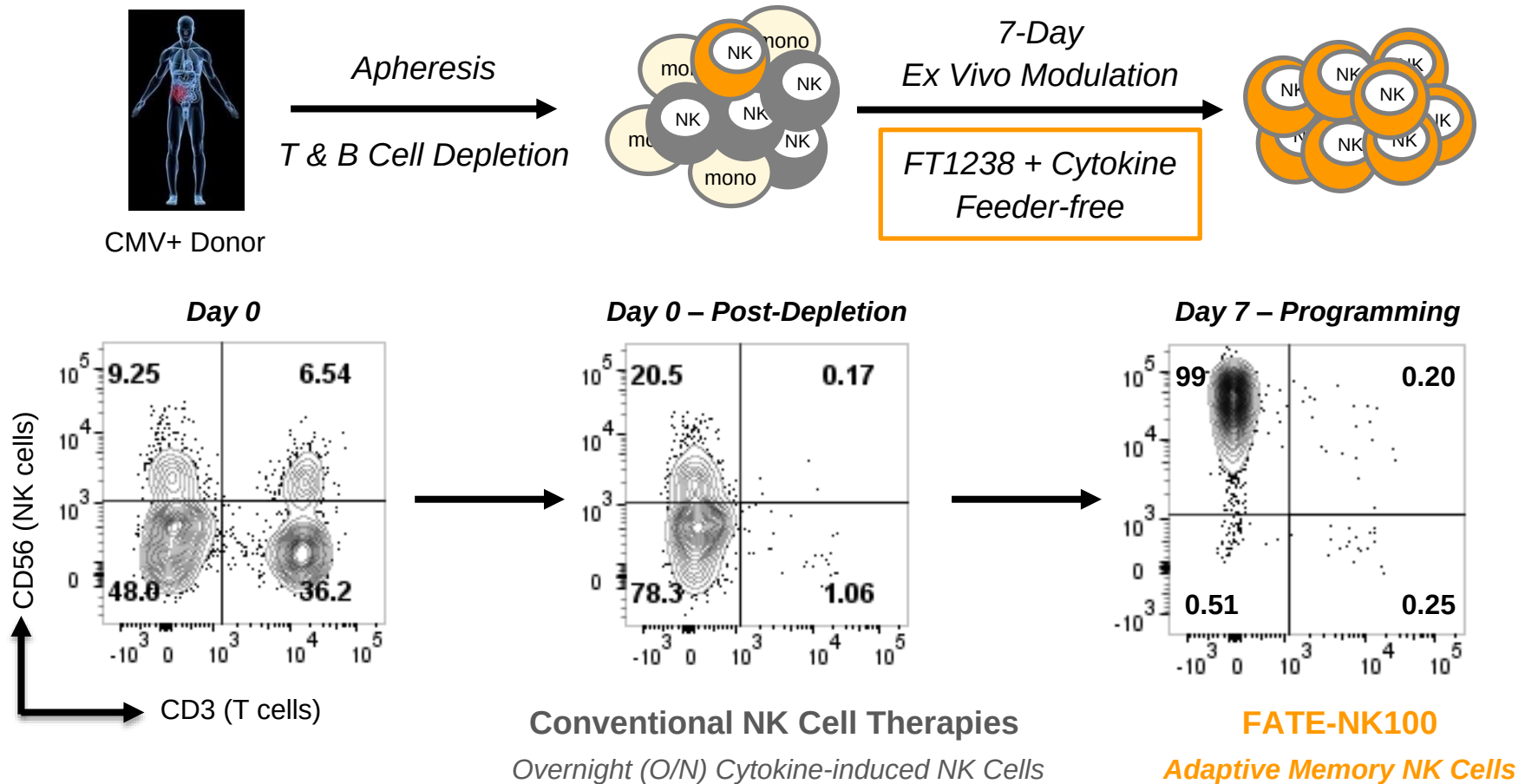
Conventional NK Cells



Adaptive Memory NK Cells

FATE-NK100

Realizing the Potential of Adaptive Memory NK Cells

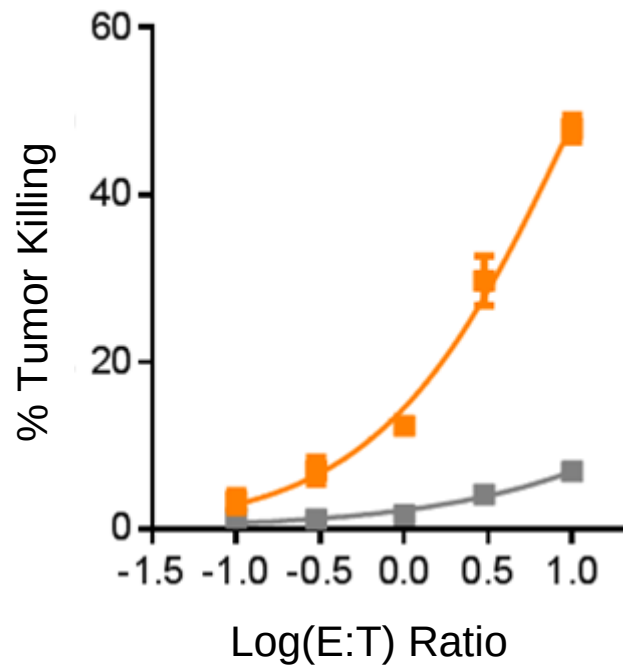


FATE-NK100

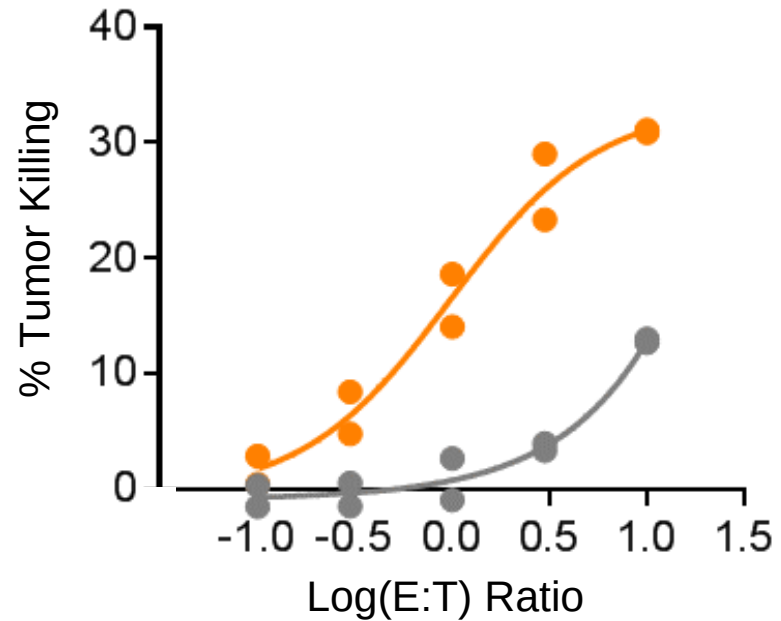
Potent Direct Cellular Cytotoxicity



KG1 AML Cell Line



Patient-Derived Primary AML Blasts

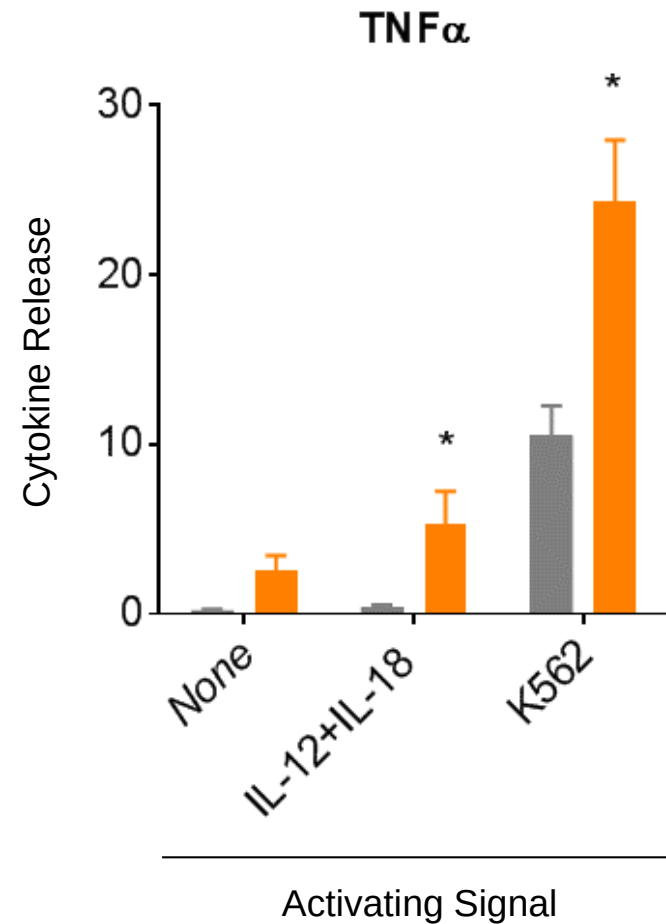
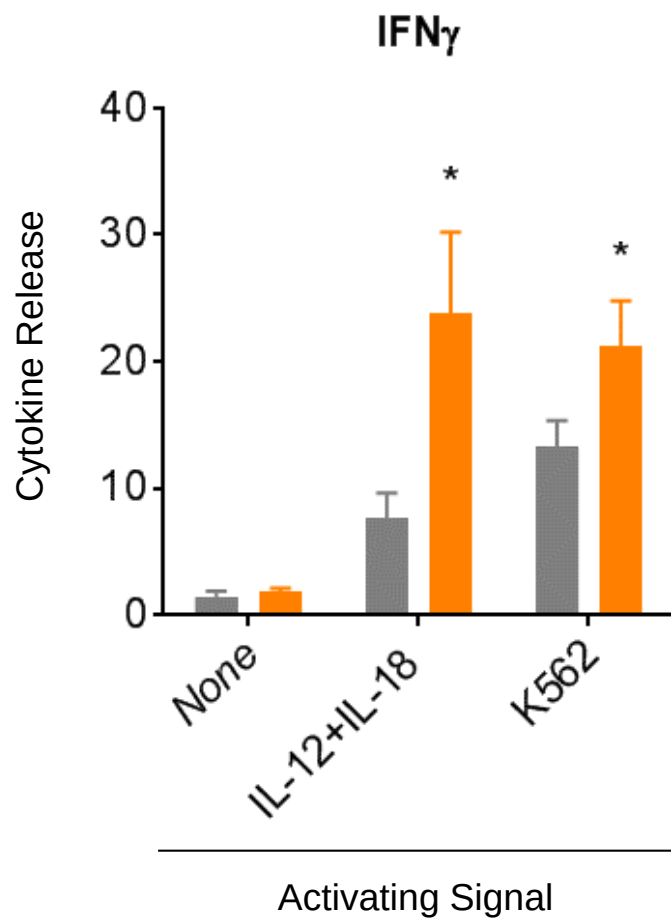


— FATE-NK100

— O/N Cytokine-induced

FATE-NK100

Elevated Cytokine Production for Inducing T-Cell Response



— FATE-NK100

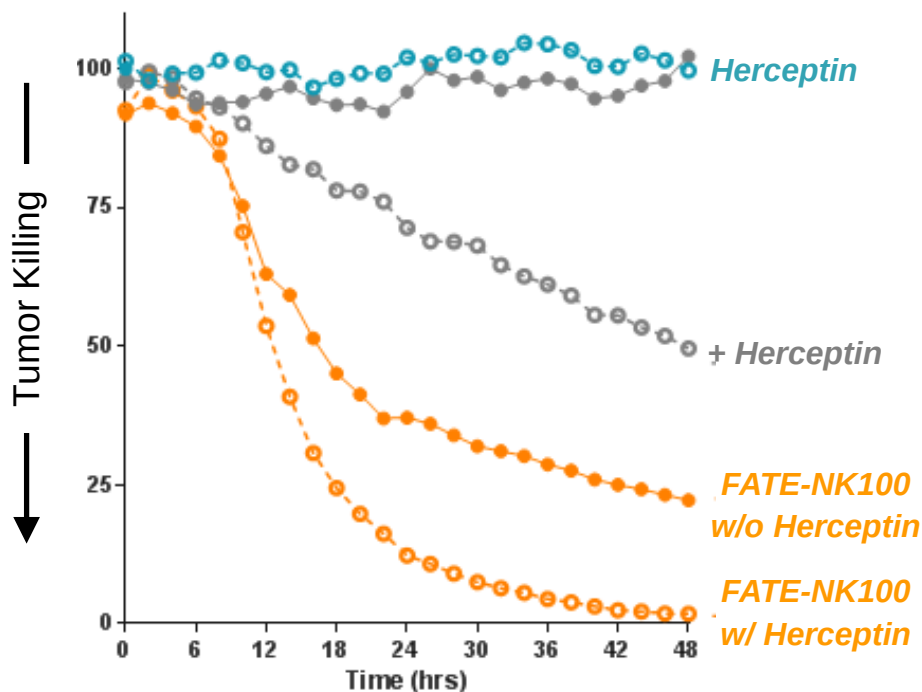
— O/N Cytokine-induced

FATE-NK100

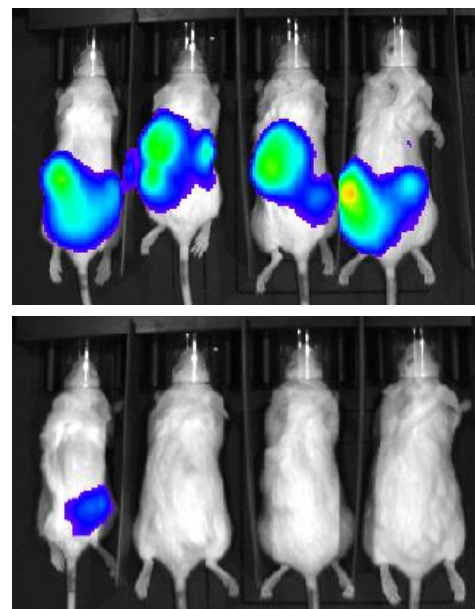
Augmented ADCC Effector Function

Exploiting CD16 IgG antibody-binding receptor in combination with FDA-approved mAbs for solid tumors

SKOV3 (Ovarian Cancer) Line



Luc-SKOV3 Tumor Image Analysis Day 21



Herceptin

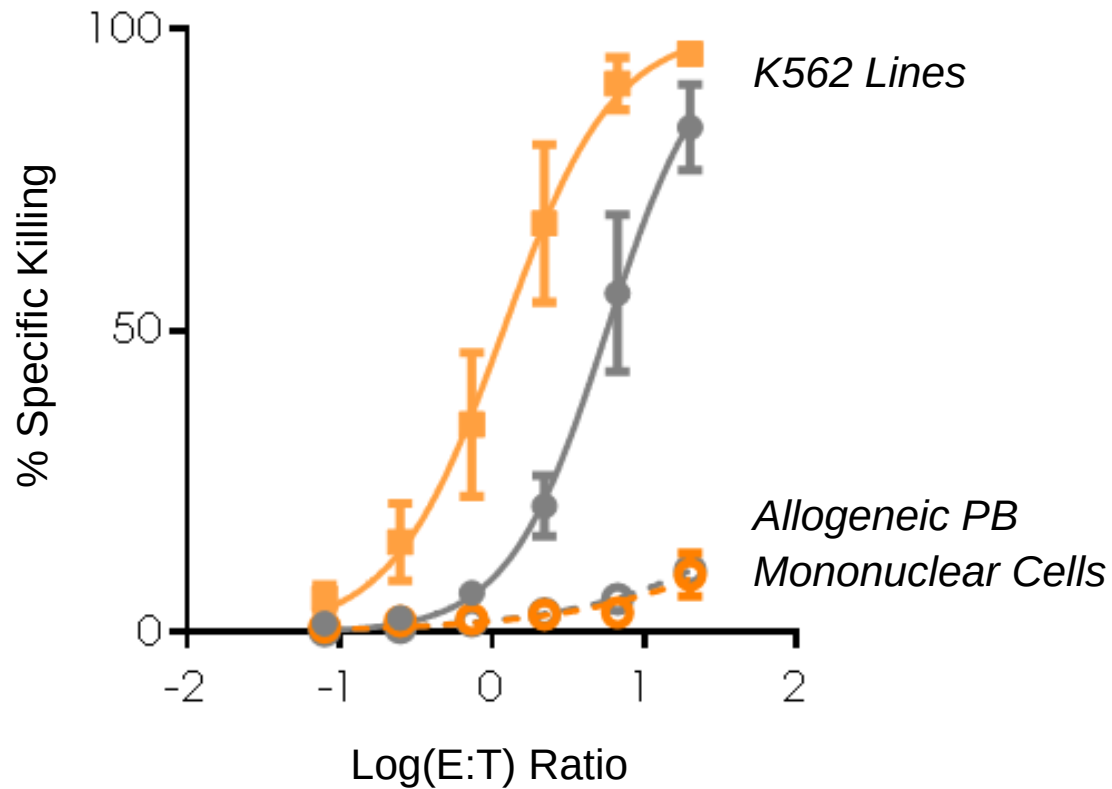
*FATE-NK100
+ Herceptin*

FATE-NK100

Tumor Cell-Specific Cytotoxicity



Multiplex Killing Assay



— FATE-NK100

— O/N Cytokine-induced

FATE-NK100

Launch of Multi-pronged Clinical Development Strategy



VOYAGE *Refractory / Relapsed AML*

- Clinical precedent for donor NK cell therapy with 25-30% CRs
- IV infusion; 3 dose levels; 10-patient expansion
- Key read-outs: NK cell persistence; rates of CR and MRD
- 1st patient treated at UMN; initial data expected in 2H17

APOLLO *Recurrent Ovarian*

- Significant majority of tumor cells express stress ligands
- IP administration; 3 dose levels; 10-patient expansion; outpatient
- Key read-outs: NK cell persistence; tumor shrinkage by RECIST
- IND cleared; initial data expected in 2H17

DIMENSION *mAb Combination in Solid Tumors*

- First clinical investigation of donor NK cells + mAb therapy
- IV infusion; 3 dose levels; 10-patient expansion; outpatient
- 3 parallel arms: mono; trastuzumab combo; cetuximab combo
- IND cleared; initial data expected in 2H17

Ushering in an Off-the-Shelf Cell Product Paradigm



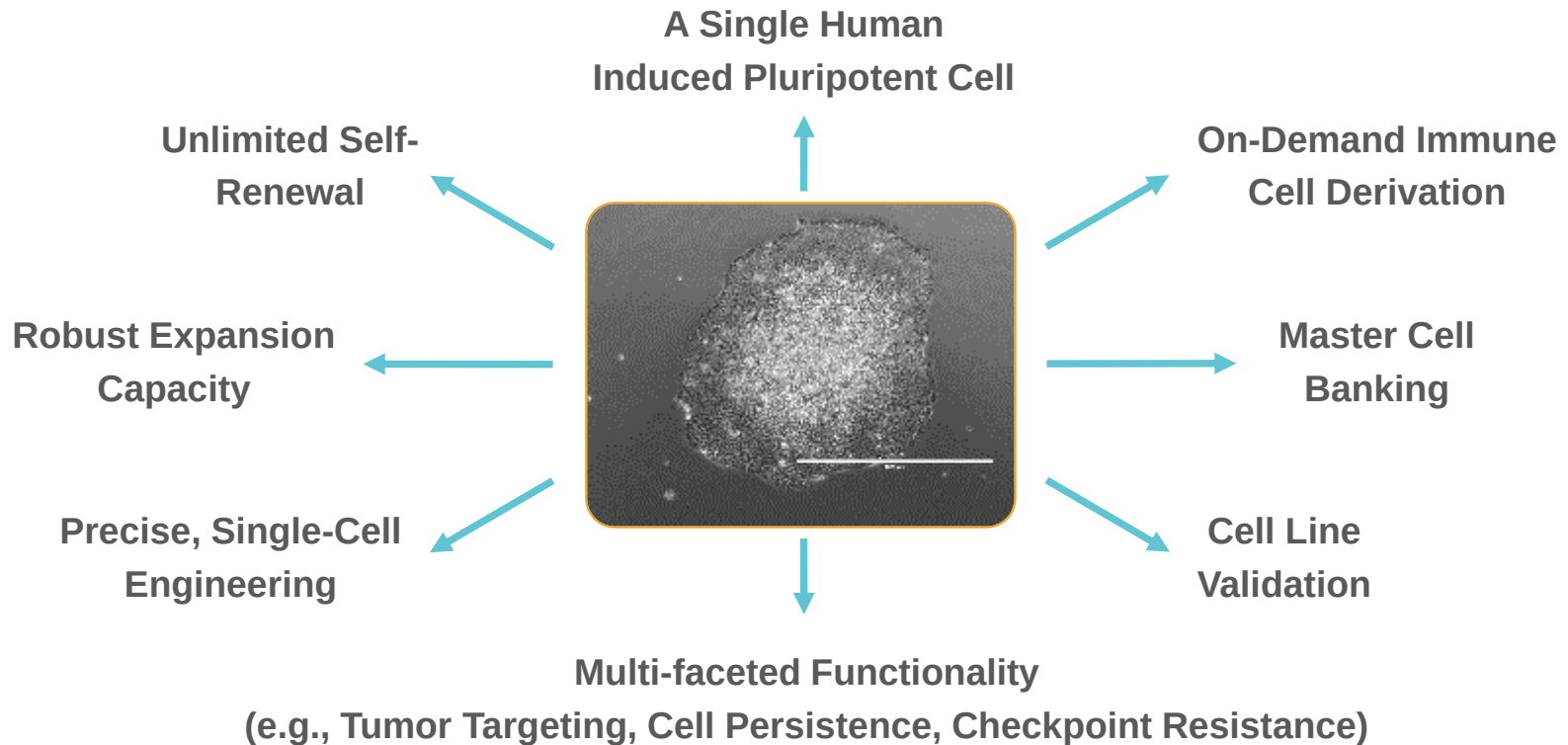
Key Features	Today	Tomorrow
Cell Source	Patient / Donor Cells	Master Cell Line
Genetic Engineering	Random & Variable	Precise & Complete
Manufacturing	Patient-specific	Off-the-Shelf
Product Consistency	Heterogeneous	Homogeneous
Therapeutic Functionality	Single MOA	Multiple MOA
Delivery	Delayed & Uncertain	On Demand
Dose-per-Patient	Single	Multiple
Overall Paradigm	Patient-centric	Product-centric

Human Induced Pluripotent Stem Cells

Renewable Source for Off-the-Shelf Cell Products

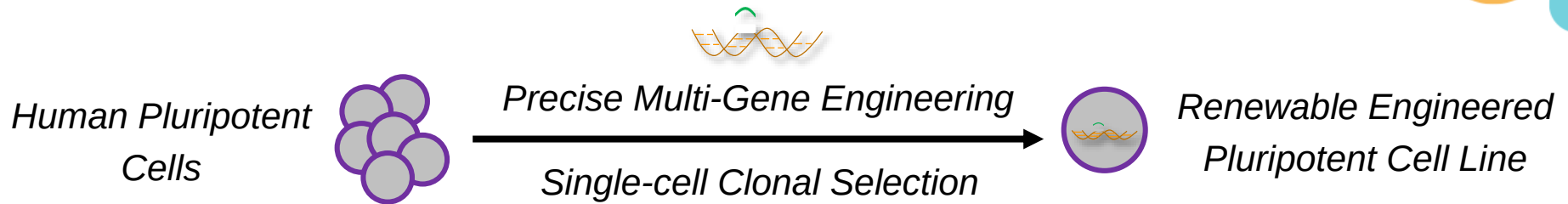


Using Engineered Pluripotent Cell Lines to Create NK Cells and T Cells



Renewable | Engineered | Clonal Cell Lines

Off-the-Shelf Cell Products Derived From Renewable Engineered Pluripotent Cell Lines



Off-the-Shelf | Homogeneous | Cell Products



Does not require patient-sourced cells

Off-the-shelf production of cells

Consistent and reliable product forms

Unprecedented scalability

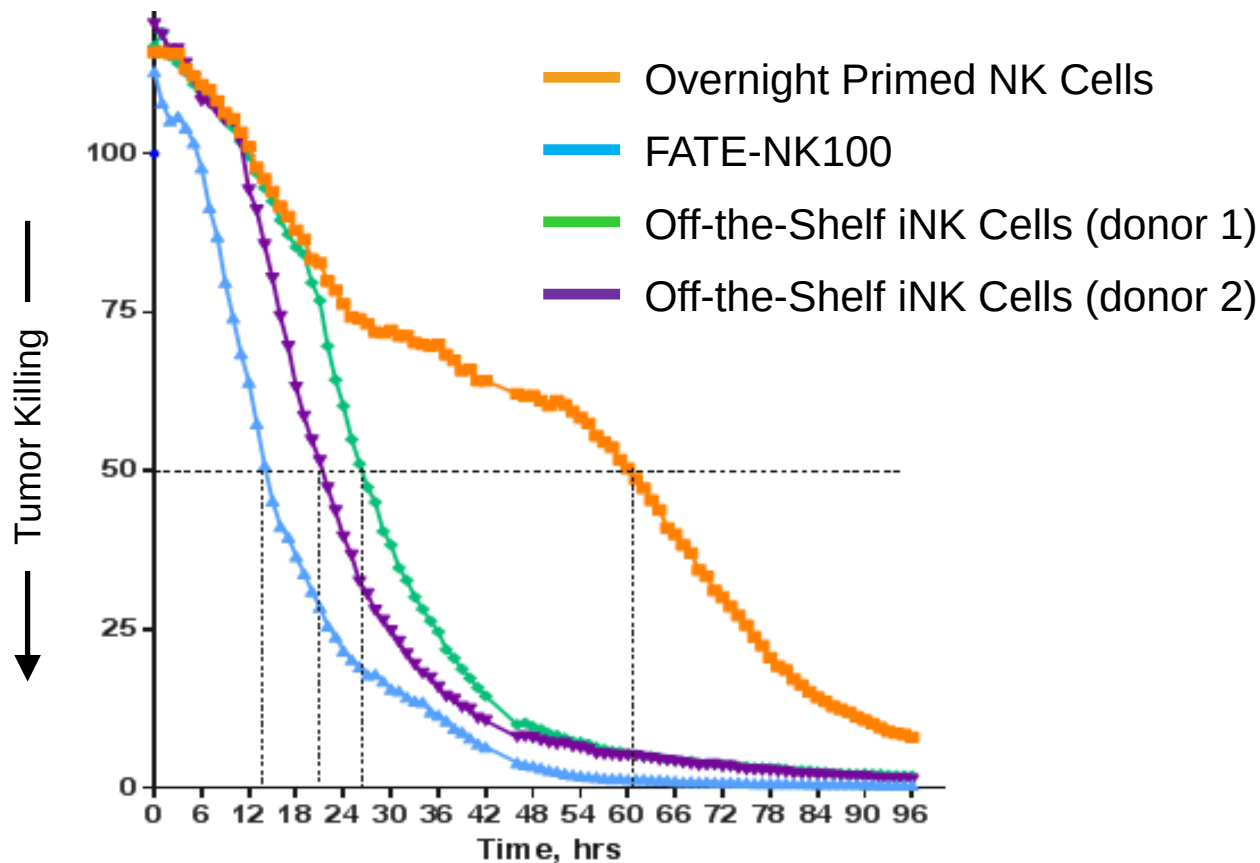
Addresses Critical Limitations of Patient-Sourced Cell Therapies

Off-the-Shelf iNK Cell Cancer Immunotherapy

Potent Direct Cellular Cytotoxicity



SKOV3 (Ovarian Cancer) Killing Assay



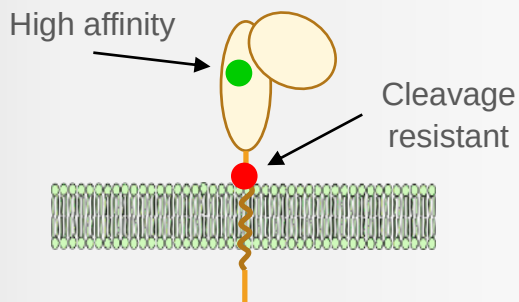
Engineered hnCD16 iNK Cell Product Candidate

Off-the-Shelf Cornerstone Approach for Solid Tumors



Engineered high-Affinity non-Cleavable CD16 Fc Receptor

Modified form of CD16a
IgG antibody-binding receptor
resists shedding upon activation



FDA-approved Monoclonal
Antibodies

Rituxan
Rituximab

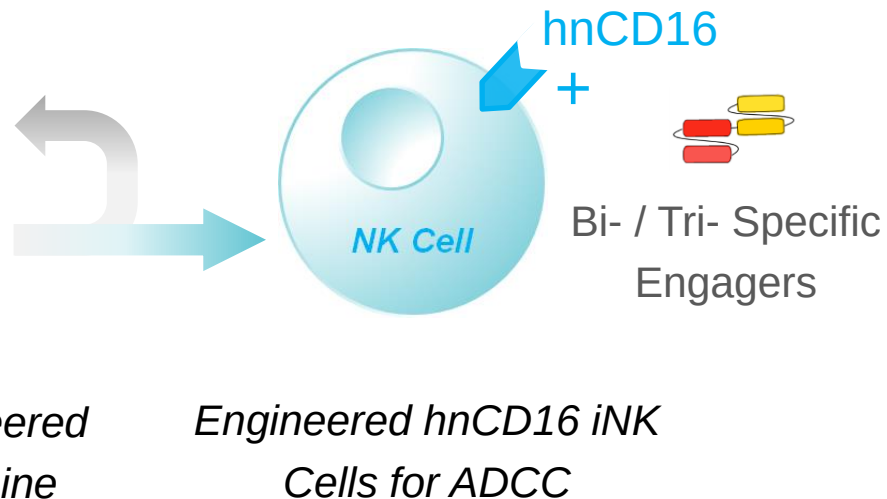
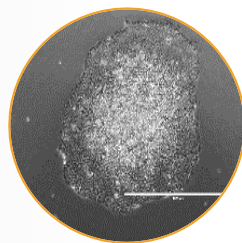
Herceptin
trastuzumab



ERBITUX
CETUXIMAB

DARZALEX

*Renewable Engineered
Pluripotent Cell Line*



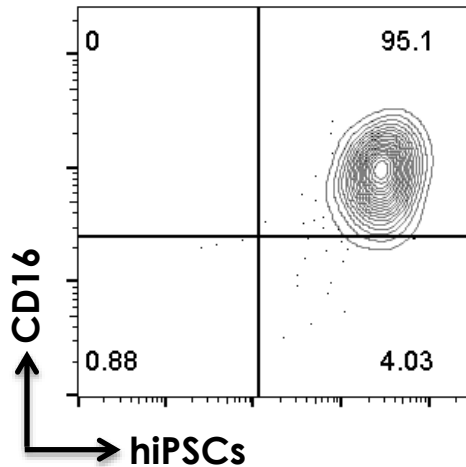
*Engineered hnCD16 iNK
Cells for ADCC*

Engineered hnCD16 iNK Cell Product Candidate

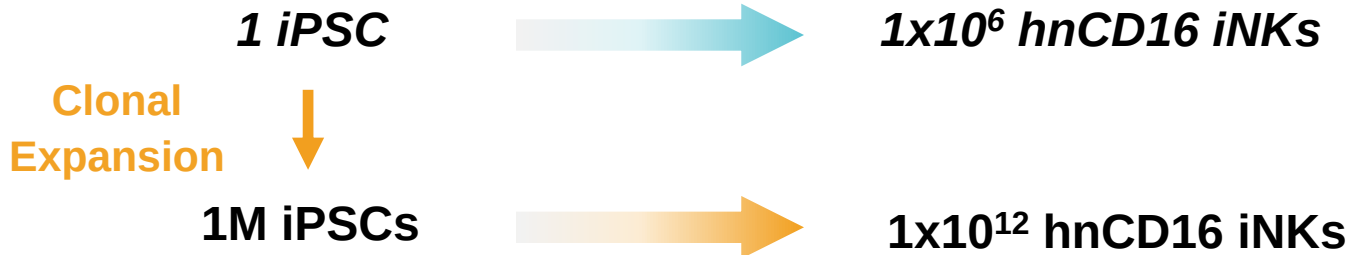
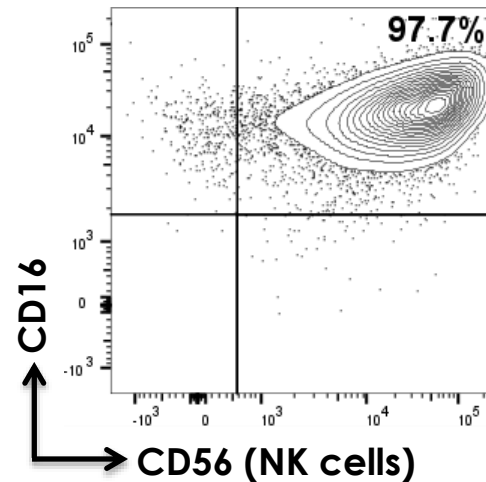
From a Single iPSC to a Clonal Effector Cell Population



*Renewable Engineered
Pluripotent Cell Line*



*Engineered hnCD16 iNK
Cells for ADCC*

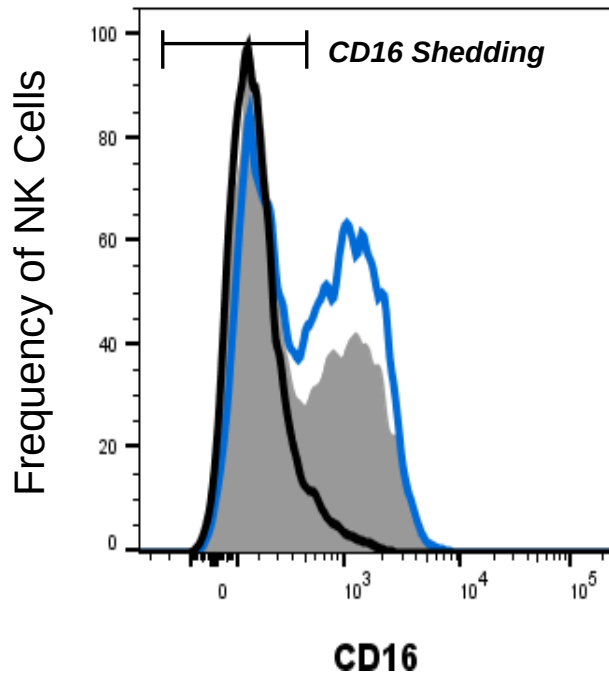


Engineered hnCD16 iNK Cell Product Candidate

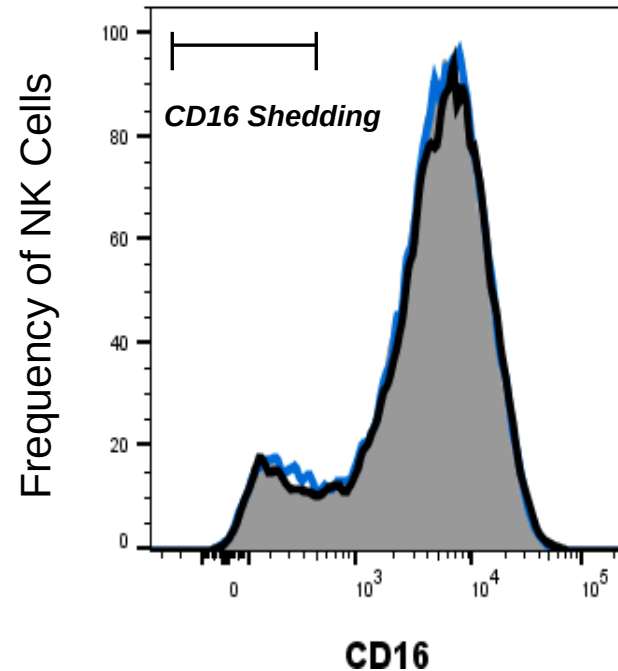
CD16 is Expressed and Continuously Maintained



Conventional NK Cells



hnCD16 iNK Cells



Control (homeostasis in culture)

Treated with TACE / ADAM inhibitor (inhibits CD16 cleavage)

Activated with K562 (induces CD16 shedding)

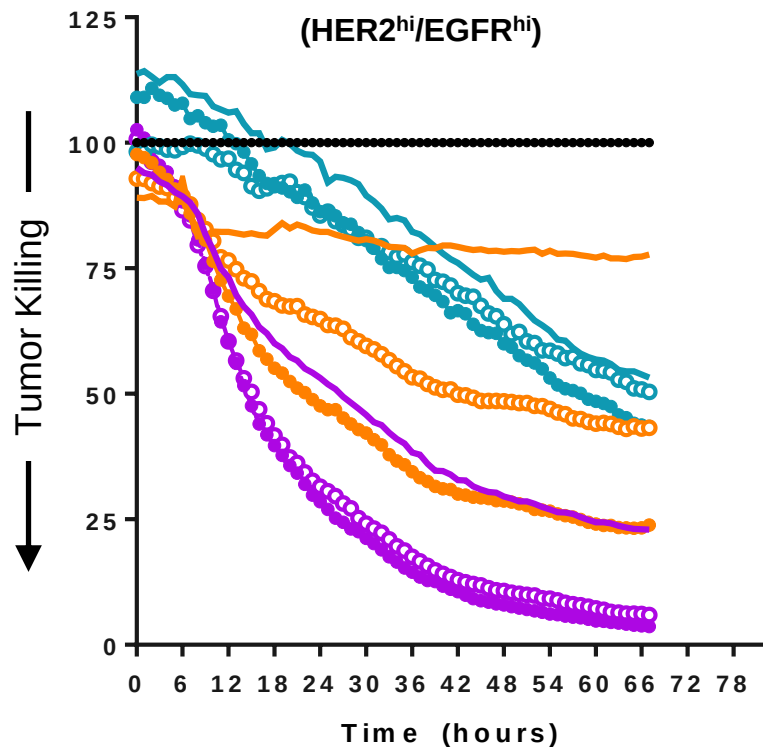
Engineered hnCD16 iNK Cell Product Candidate

In Vitro ADCC for Solid Tumors



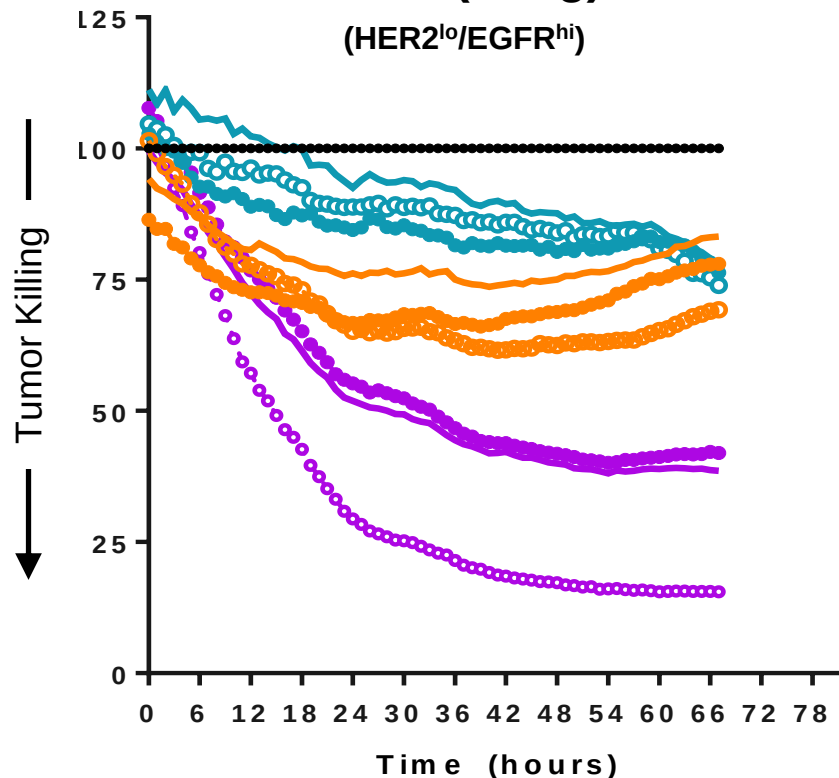
SKOV3 (Ovarian)

(HER2^{hi}/EGFR^{hi})



A549 (Lung)

(HER2^{lo}/EGFR^{hi})



Target cells only

pbNK (n=3)

Cord blood NK (n=1)

hnCD16 iNK (n=3)

No antibody

Anti-Her2

Anti-EGFR

Off-the-Shelf iT Cell Cancer Immunotherapy

Memorial Sloan Kettering Collaboration



Dr. Michel Sadelain, MD, PhD

Director, Center for Cell Engineering
Memorial Sloan Kettering Cancer Center

LETTERS

Generation of tumor-targeted human T lymphocytes
from induced pluripotent stem cells for cancer therapy

nature
biotechnology

Cell Stem Cell

Perspective

New Cell Sources for T Cell Engineering
and Adoptive Immunotherapy

CellPress

“Engineering therapeutic attributes into pluripotent cell lines is a breakthrough approach to renewably generate potent T-cell immunotherapies. This unique approach offers the prospect for off-the-shelf delivery of T-cell therapies with enhanced safety and therapeutic potential at the scale necessary to serve significant numbers of patients.”

Fate Therapeutics and Memorial Sloan Kettering Cancer Center Launch Partnership for Development of Off-the-Shelf T-Cell Immunotherapies

*Unite Cellular Immunotherapy Expertise to Accelerate Clinical Translation of
Off-the-Shelf Products Offering Broad Patient Access*

*Collaboration to Use Engineered Pluripotent Cell Lines to Renewably Generate
T-Cell Product Candidates*

*Foundational Intellectual Property Covering Pluripotent Cell-derived Engineered T Cells
Exclusively Licensed to Fate Therapeutics*

Renewable Engineered Pluripotent Cell Platform

Our Foundational Intellectual Property



Over 90 Issued Patents and 100 Pending Applications



WHITEHEAD INSTITUTE



Memorial Sloan Kettering
Cancer Center™



- **Exclusive licenses from pioneers in the induced pluripotent cell field**
 - Drs. Rudolf Jaenisch (Whitehead Institute) and Sheng Ding (TSRI)
- **OCT4-based generation of pluripotent cells**
 - Broadly cover cell compositions expressing OCT4
 - Critical to inducing cells to pluripotent state
- **Small molecule-based pluripotent cell programming**
 - Broadly cover compositions / uses in pluripotent cell induction, maintenance and expansion
 - Critical for generation of clonal populations of cells



Immuno-Regulatory Programs



A Next-Generation Hematopoietic Cell Graft to Prevent Acute Graft-versus-Host Disease

ProTmune™

Small molecule programmed mobilized peripheral blood graft



FT1050 + FT4145



- **Allogeneic HCT performed with curative intent**
 - Orphan hematologic malignancies (e.g., AML, ALL, MDS)
 - Rare genetic disorders (e.g., β -thalassemia, sickle cell)
- **Attractive market opportunity**
 - ~30,000 allogeneic HCT procedures performed annually
 - Conducted at concentrated number of centers of excellence
- **Significant unmet medical need**
 - 40%+ mortality rate at 1 year
 - Acute GvHD is leading cause of early morbidity and mortality
 - 40-80% of patients experience Grades 2-4 acute GvHD
 - No FDA approved therapies for prevention

Pathophysiology of Acute GvHD

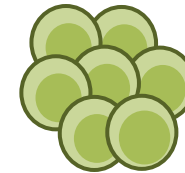
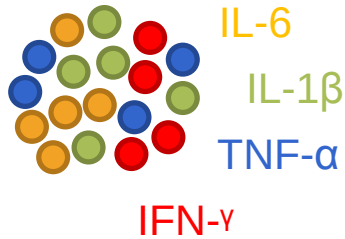


Conditioned
Patient

Tissue Damage



Cytokine Storm



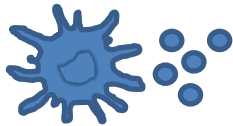
T Cells



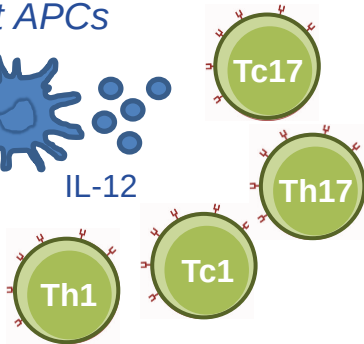
Donor

Donor Allo-reactive T-cell Activation

Host APCs



IL-12

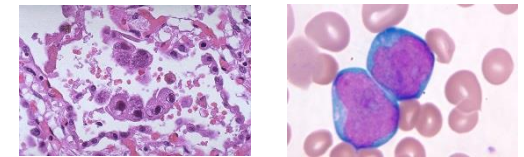


Assault on Patient Tissue



Acute GvHD (gut, liver, skin)
~40-80% D100 cumulative incidence
~10-20% early mortality

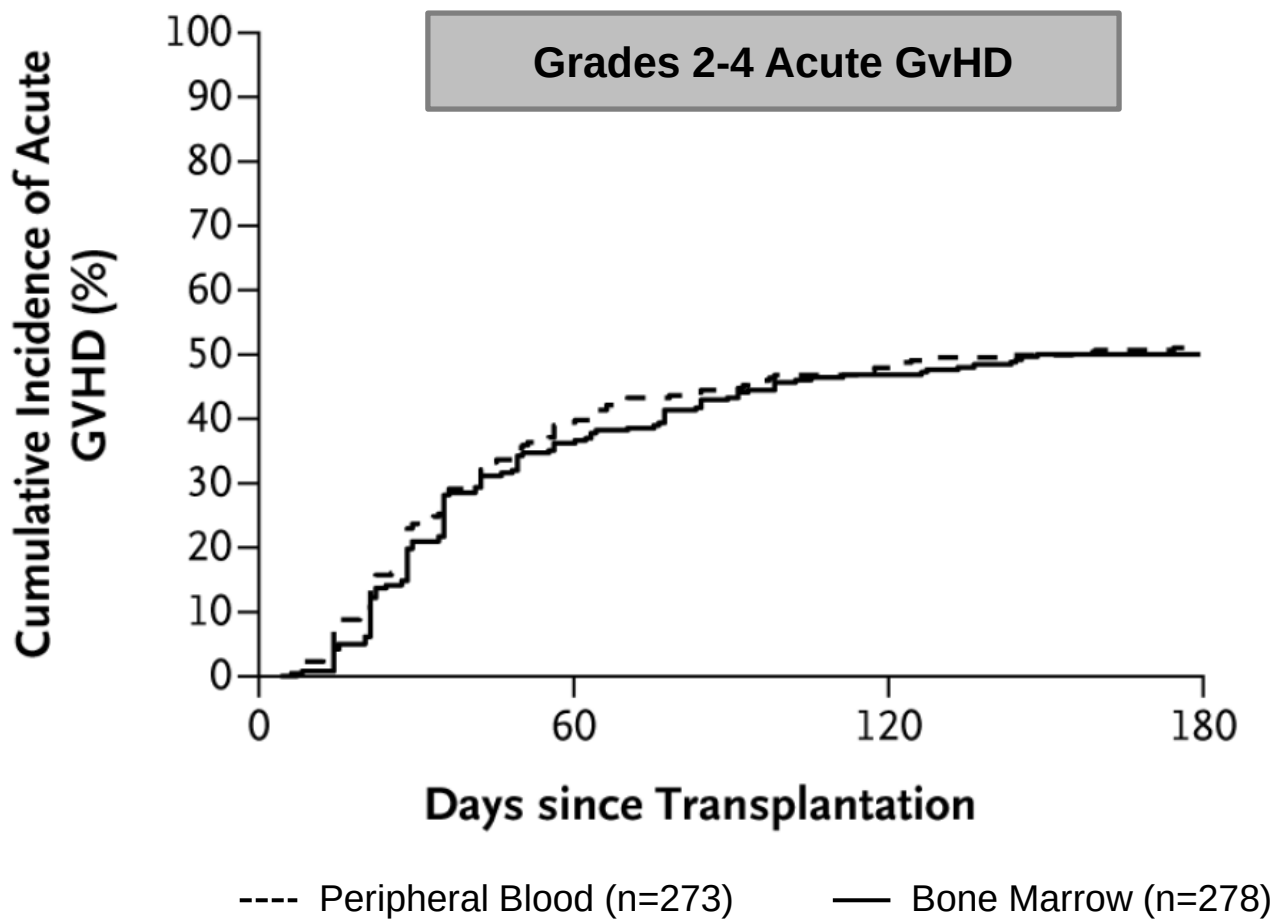
Immunosuppressive Agents



Severe Infections
~70% D100 cumulative incidence
Relapse
~35% 1YR cumulative incidence

Incidence of Grades 2-4 Acute GvHD

Matched Unrelated Donor Allogeneic HCT



N Engl J Med. 2012 October 18; 367(16) doi:10.1056/NEJMoa1203517

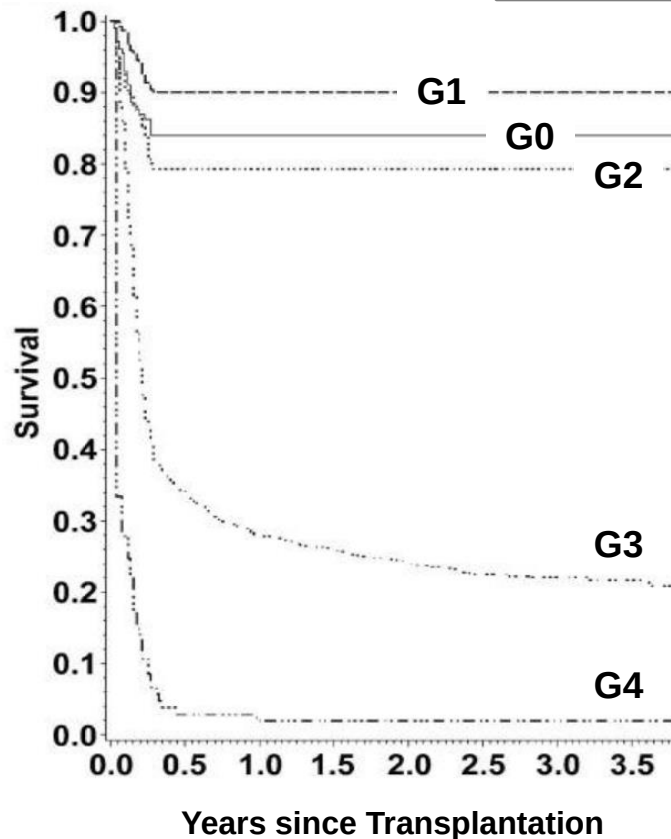
NCT00075816: Randomized Phase 3; 551 patients; 48 centers

Incidence of Grades 2-4 Acute GvHD

Grade Matters!



Probability of Survival

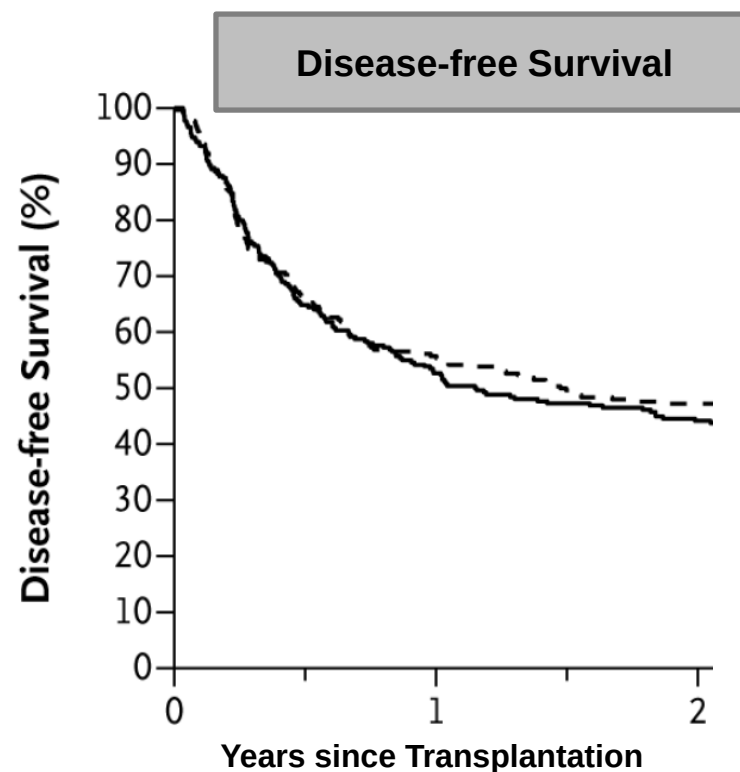
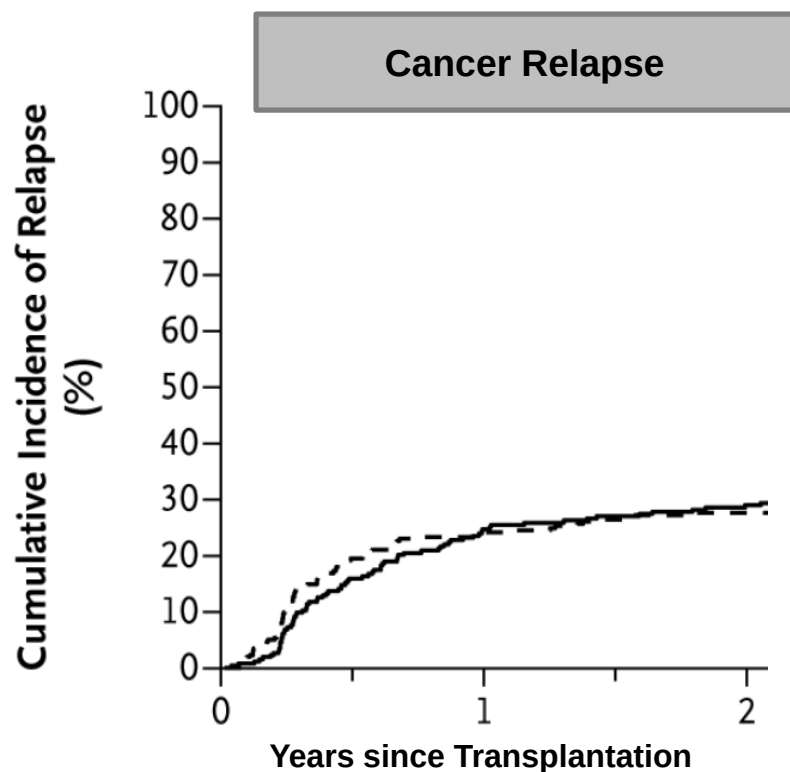


Multivariate Analysis of the Association between aGVHD with 100-day and 1-year Mortality

GVHD grade	No.	100-d mortality		1-y mortality	
		Odds ratio	<i>P</i>	Odds ratio	<i>P</i>
Glucksberg					
No GVHD	157	1.00	1.00		
Maximum grade of I or II	285	0.29	< .001	0.8	.166
Maximum grade of III	109	1.04	.900	2.2	.002
Maximum grade of IV	41	4.30	< .001	13.1	< .001

Cancer Relapse & Overall Survival

Matched Unrelated Donor Allogeneic HCT



----- Peripheral Blood (n=273)

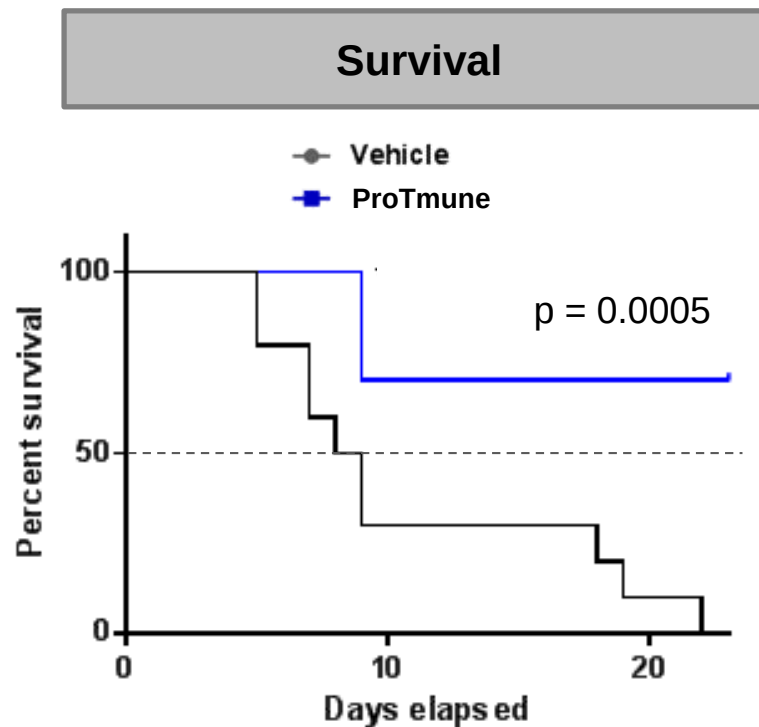
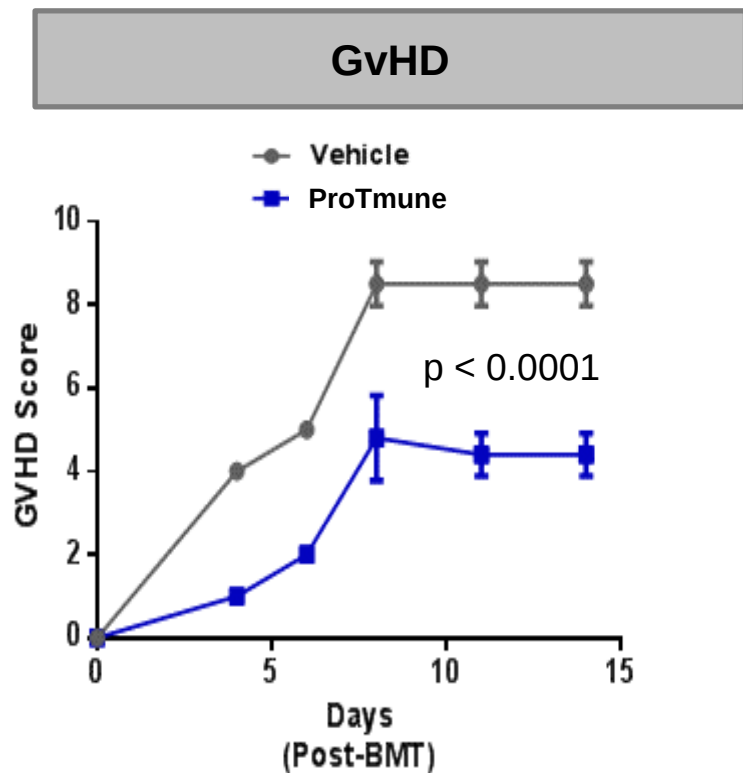
———— Bone Marrow (n=278)

N Engl J Med. 2012 October 18; 367(16) doi:10.1056/NEJMoa1203517

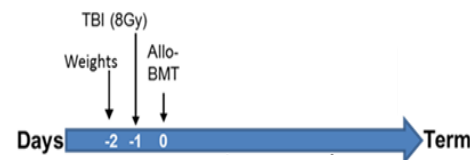
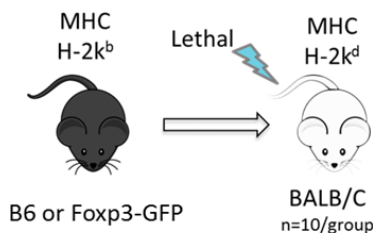
NCT00075816: Randomized Phase 3; 551 patients; 48 centers



In Vivo Efficacy of ProTmune



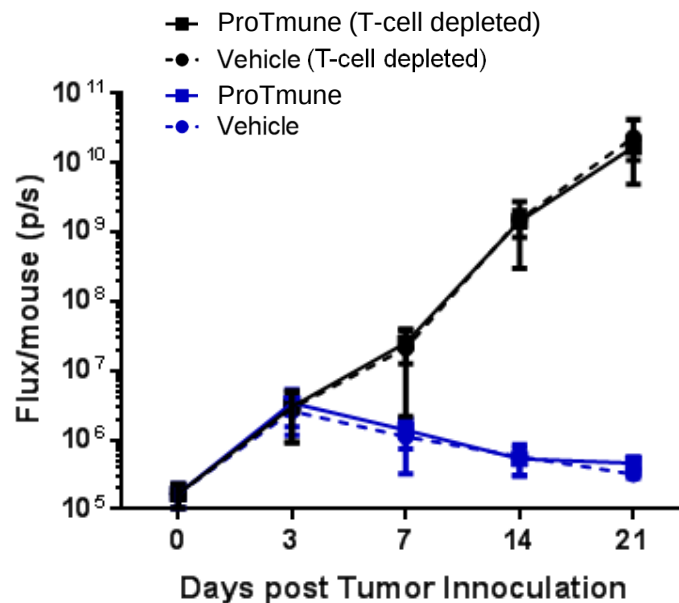
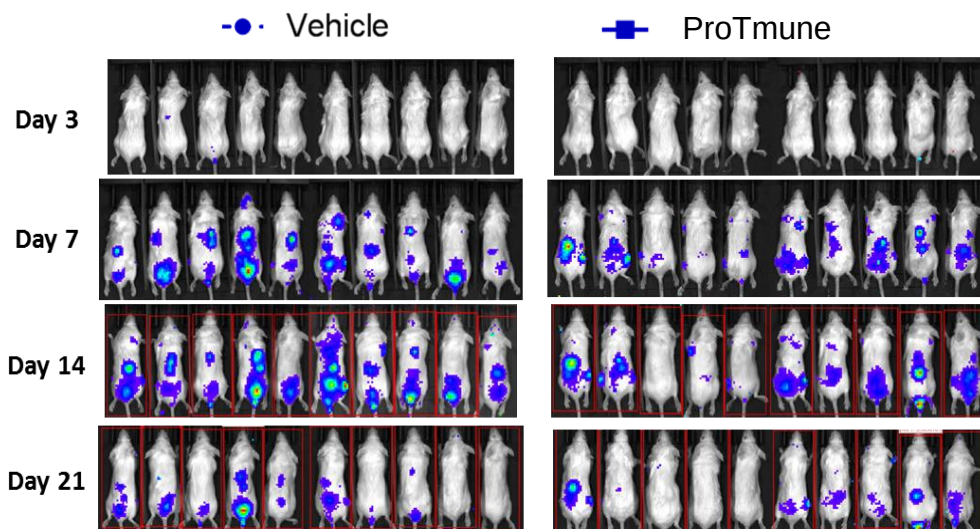
*Murine Allogeneic
Acute GvHD Model
(8 studies)*



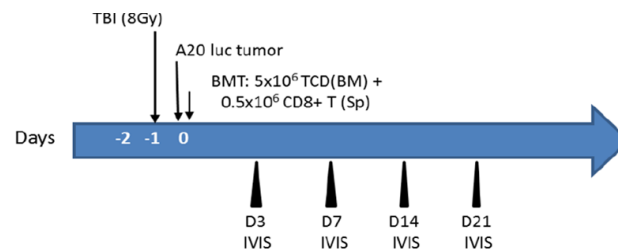
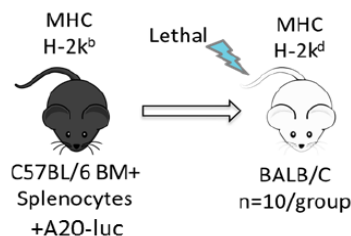


In Vivo Efficacy of ProTmune

Leukemic Cell Clearance



*Murine Allogeneic
GvL Model
(6 studies)*





Phase 1 Safety Stage of PROTECT

Design

- 6-10 subjects receiving ProTmune in open-label study
- Matched unrelated donor (MUD) mPB HCT with myeloablative conditioning
- Hematologic malignancies include ALL, AML & MDS
- Standard of care GvHD prophylactic (Methotrexate / Tacrolimus)

Safety Criteria

- Day 28 Engraftment without Graft Failure
- Day 28 Survival

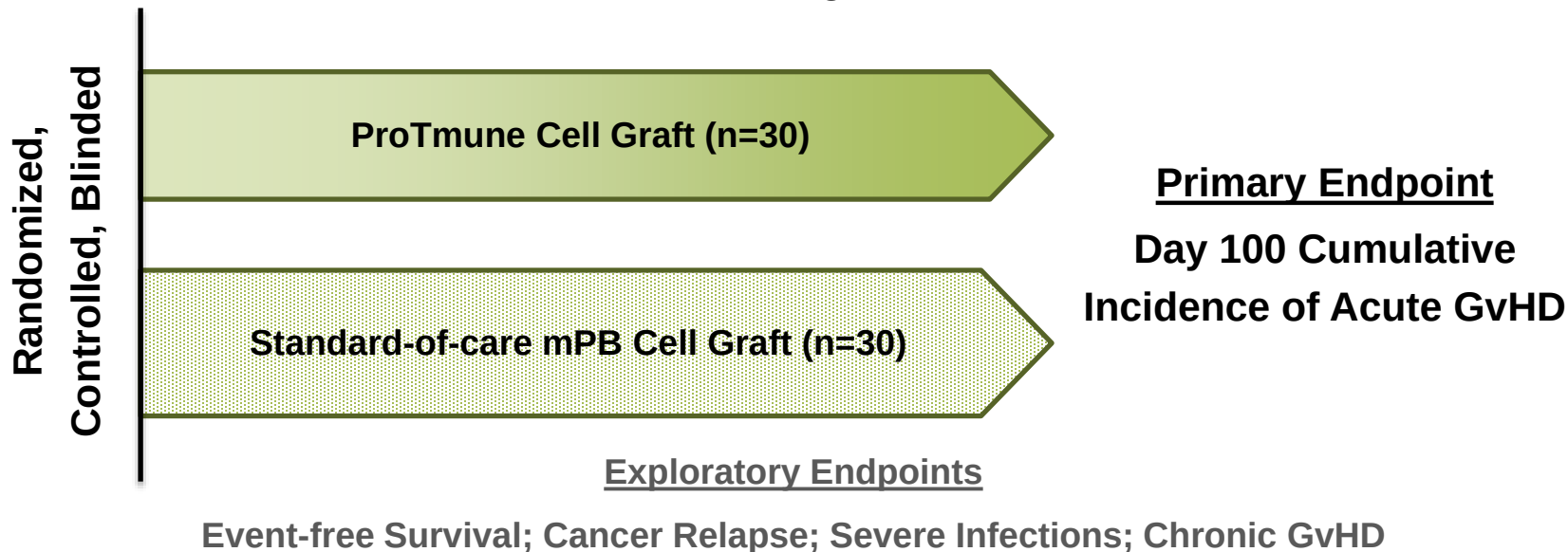
Status

- Open at 12 U.S. Centers
- Six patients have received ProTmune

*Convened Data Monitoring Committee to Review Phase 1 Data
and to Seek Recommendation for Phase 2 Initiation*



Phase 2 Efficacy Stage of PROTECT



*Prepared for Phase 2 Initiation in September 2017 Following
Data Monitoring Committee's Phase 1 Review*



- **Preventive approach to address leading cause of early morbidity and mortality**
 - 40 to 80% of patients undergoing allogeneic HCT experience acute GvHD
 - Death directly attributable to acute GvHD or its treatment occurs in 10 to 20% of patients
 - No approved preventive therapies in the U.S.
- **Highly-differentiated therapeutic paradigm**
 - Optimize biological properties of donor hematopoietic cells *ex vivo* using small molecules
 - On-site manufacture integrates into current clinical practice
 - Avoids costly and time-consuming measures (e.g., genetic engineering, cell expansion, cell separation)
- **Strong commercial positioning targeting significant market opportunity**
 - Matched unrelated donor (MUD) for hematologic malignancies is predominant HCT setting
 - Composition of matter patents extending through 2032
 - Secured Fast Track in US and broad Orphan Drug Designations in US and EU
- **PROTECT study has potential to support accelerated registration and validate broader opportunity**
 - Phase 2 stage is randomized, controlled and blinded (investigator and subject)
 - Potential to expand into additional HCT settings (Haplo, MRD) and other disease (rare genetic disorders)



Financial Summary & Milestones

Financial Summary



Three Months Ended June 30, 2017	
Revenue	\$1.0M
R&D Expense	\$7.9M
G&A Expense	\$2.7M
Operating Expense, Adjusted ¹	\$9.1M
Cash & Cash Equivalents ²	\$78.5M
Employees	71
Total Shares Outstanding ³	55.5M

[1] Excludes \$1.0M in stock-based compensation expense and \$0.5M in Juno-related research expense.

[2] Includes \$7.5M in cash proceeds from July 2017 amendment of Silicon Valley Bank Loan Agreement.

[3] Includes 14.1M shares of common stock from conversion of non-voting preferred stock.

Clinical Momentum

Potential Upcoming Milestones



FATE-NK100

- Enrollment in 3 open-label studies x 5 treatment arms
- Initial clinical data at 2H17 scientific conferences
- Initiation of expansion cohorts

iPSC Product Pipeline

- Preclinical data on first-of-kind iNK and iT cell pipeline
- FT500i IND filing for checkpoint inhibitor combo
- FT516i IND filing for mAb combo

ProTmune™

- Completion of IDMC P1 Day 28 safety review
- Initiation of P2 efficacy stage of PROTECT
- P1 Day 100 efficacy data at ASH

First-in-Class Cellular Immunotherapy Pipeline



PROGRAM	PRECLINICAL	CLINICAL	RIGHTS
IMMUNO-ONCOLOGY			
FATE-NK100 – AML			Worldwide
FATE-NK100 – Solid Tumor mAb Combo			Worldwide
FATE-NK100 – Ovarian			Worldwide
FT500i (iNK Cell)	OTS		Worldwide
FT516i (Engineered hnCD16 iNK Cell)	OTS		Worldwide
Engineered CAR iT Cell	OTS		Worldwide
Ex Vivo T-Cell Modulation Collaboration			Milestones / Royalties
IMMUNO-REGULATION			
ProTmune™ – Graft-versus-Host Disease			Worldwide
ToleraCyte™ – Autoimmune Disorders			Worldwide
iReg Cell	OTS		Worldwide



Better Cells For Better Therapies™