Fate THERAPEUTICS

Better Cells For Better Therapies™

Programmed Cellular Immunotherapies

Overview of Universal, Off-the-Shelf Cancer Immunotherapy Programs

June 6, 2019

www.fatetherapeutics.com

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 research and development activities and its progress, plans and timelines for its manufacture, preclinical development and clinical investigation of its product candidates, the timing for the Company's receipt of data from its clinical trials and preclinical studies, the Company's clinical development and regulatory strategy, and the therapeutic and market potential of the Company's product candidates. 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 of its product candidates will not be observed in ongoing or future studies involving these product candidates, the risk of a delay in the initiation of, or in the enrollment or evaluation of subjects in, any clinical studies, and the risk that the Company may cease or delay manufacture, or preclinical or clinical development, of any of its product candidates for a variety of reasons (including regulatory requirements, difficulties in manufacturing or supplying the Company's product candidates, and any adverse events or other negative results that may be observed during preclinical or clinical development). These statements are also subject to other risks and uncertainties as further detailed in the Company's most recently filed periodic report, 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.

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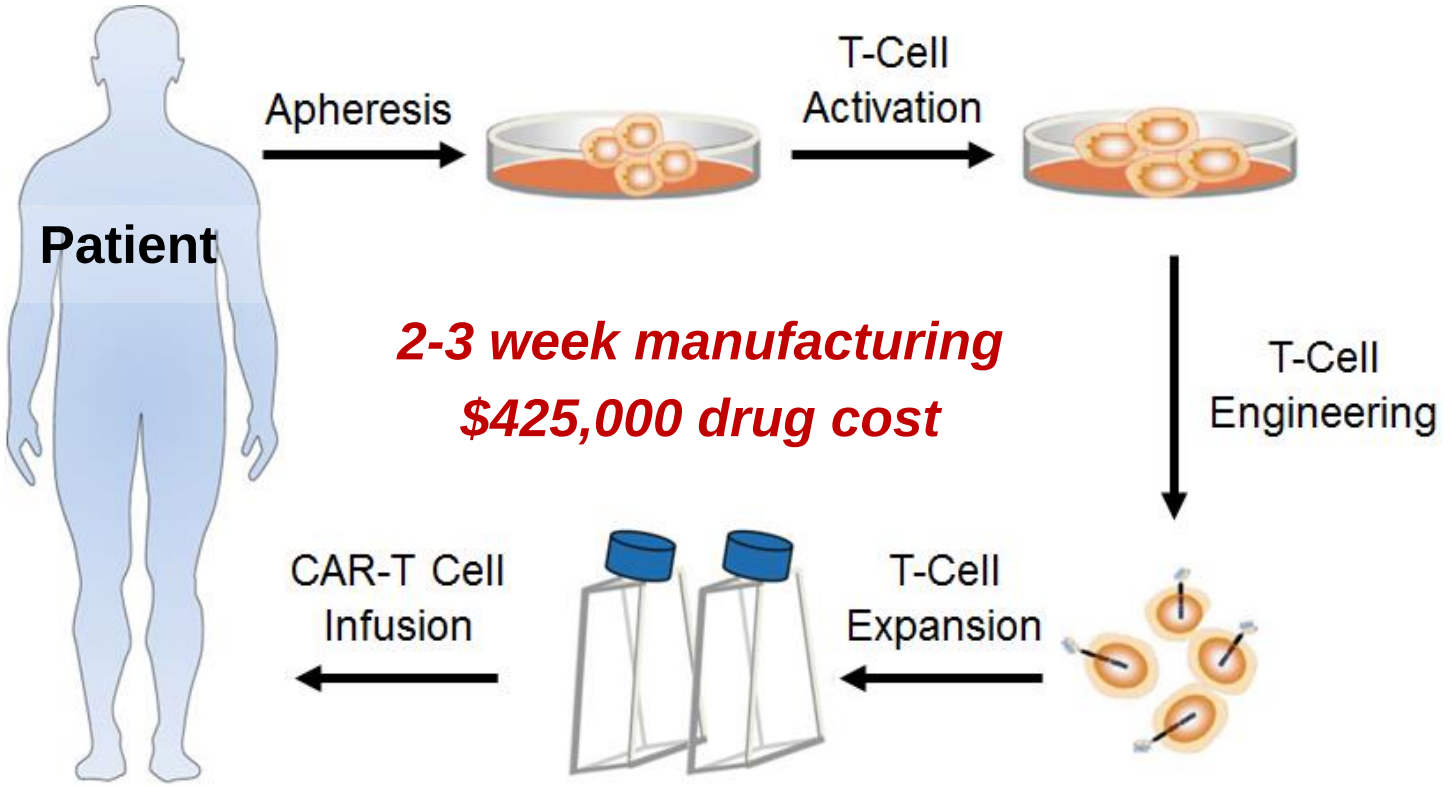
First Innings of Cell Therapy Development

Patient-derived CAR-T Cell Immunotherapy



"When factoring in all the costs associated with CAR T-cell therapy, hospitals may charge as much as $1.5 million or more to avoid losing money."

Richard T. Maziarz, MD
Professor of Medicine, Oregon Health & Science University's Knight Cancer Institute

Impaired Starting Material | **Random & Variable** Engineering | **Complex** Logistics

Heterogeneous Drug Product | **Expensive** | **Single-dose** Limitation

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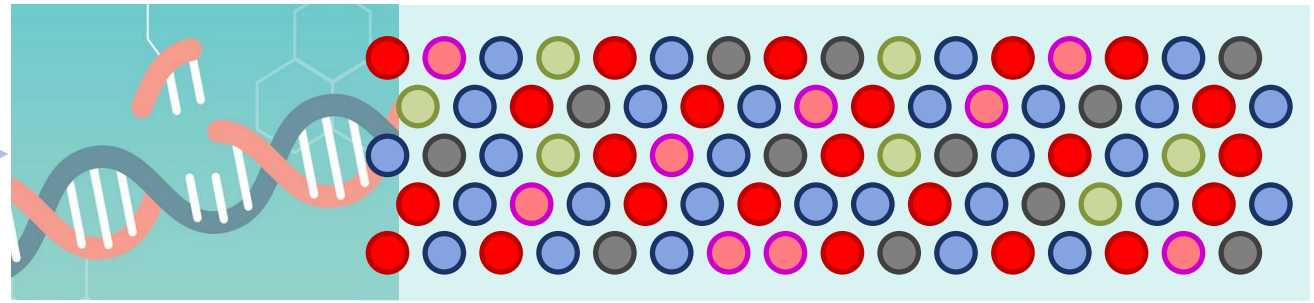
First Innings of Cell Therapy Development

Batch-to-Batch Engineering is Expensive and Results in Significant Product Heterogeneity

Each manufacturing batch is comprised of millions of variable engineering events in primary T cells

Healthy Donor or Patient

Apheresis



Product

Patient

Specificity (CAR) *+ Compatibility (TCR KO)* *+ Homing*

Off-target *Null*

T-Cell Exhaustion

How do we build on early successes and transition from a heterogenous process to the cost-effective delivery of optimized cell products?

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Changing the Game in Cell-based Cancer Immunotherapy

The Potential to Select, Characterize and Renewably Use a Single Cell

What if we had the opportunity to renewably use a <u>single</u> cell?

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Changing the Game in Cell-based Cancer Immunotherapy

Universal, Off-the-Shelf Cell Products Derived from Renewable Master Cell Lines

Key Features	Cell Therapy 1.0 and 2.0	Cell Therapy 3.0
Cell Source	Patient and Donor Cells	Renewable Master Cell Line
Genetic Engineering	Random & Variable	Uniform & Complete
Characterization	Imprecise	Well-defined
Product Identity	Heterogeneous	Homogeneous
Manufacturing	Limited Dose Availability	Off-the-Shelf Availability
Cost-per-Dose	High	Low
Dosing	Single Dose	Multiple Doses / Multiple Cycles
Overall Paradigm	**Process-centric**	**Product-centric**

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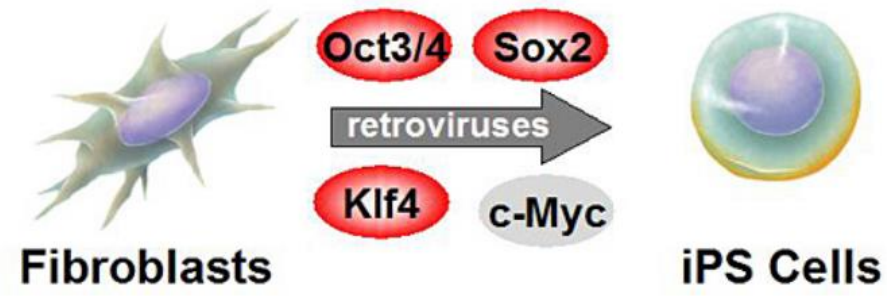
Human Induced Pluripotent Stem Cells (iPSCs)

Reprogramming Adult Somatic Cells to a Pluripotent State

Generation of Human iPSCs

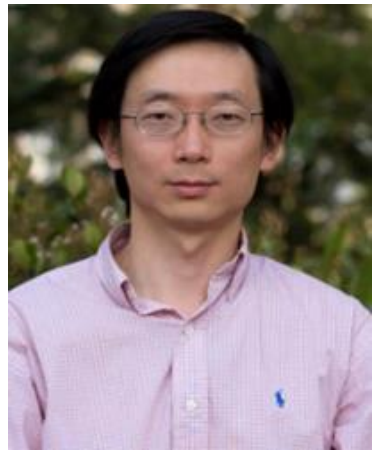


Mouse iPS cells reported in 2006

Human iPS cells reported in 2007

Fate Scientific Founders

Rudolf Jaenisch, MD



Sheng Ding, PhD

Whitehead Institute

The Scripps Research Institute®

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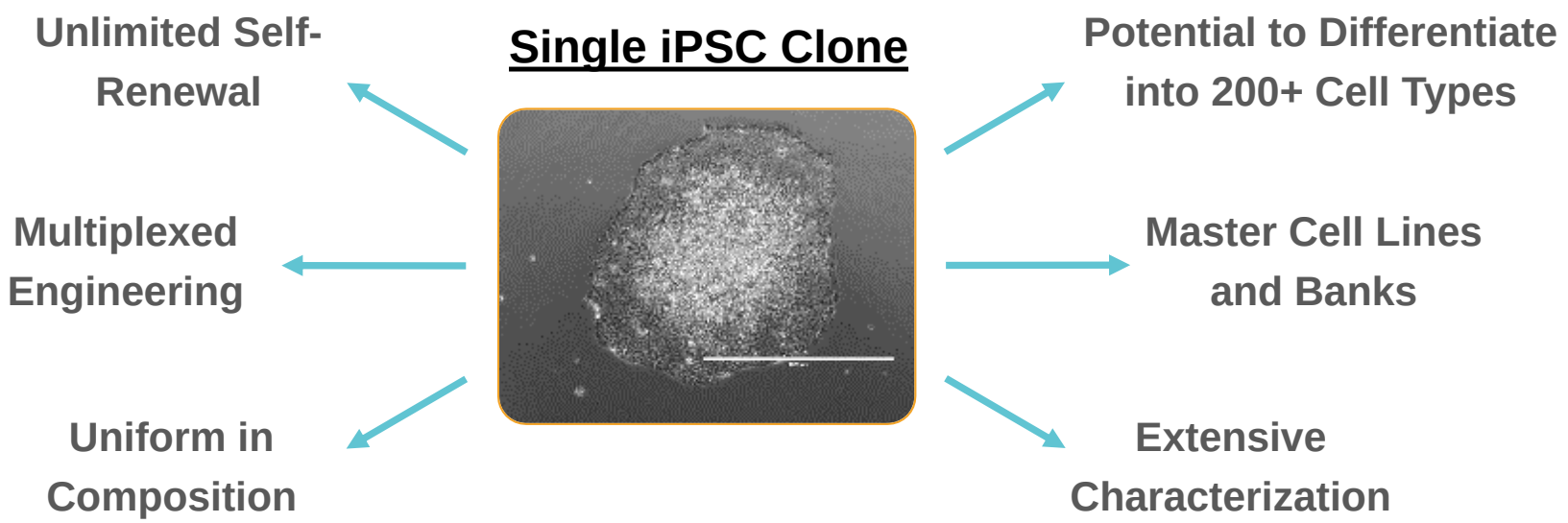
Unique Advantages of Human iPSCs

Isolation, Characterization & Selection of a Single iPSC Clone

A Single Human Induced Pluripotent Stem Cell (iPSC)

A renewable source for making cells



Fate Therapeutics' iPSC product platform is supported by an IP portfolio of 100+ issued patents and 100+ pending patent applications

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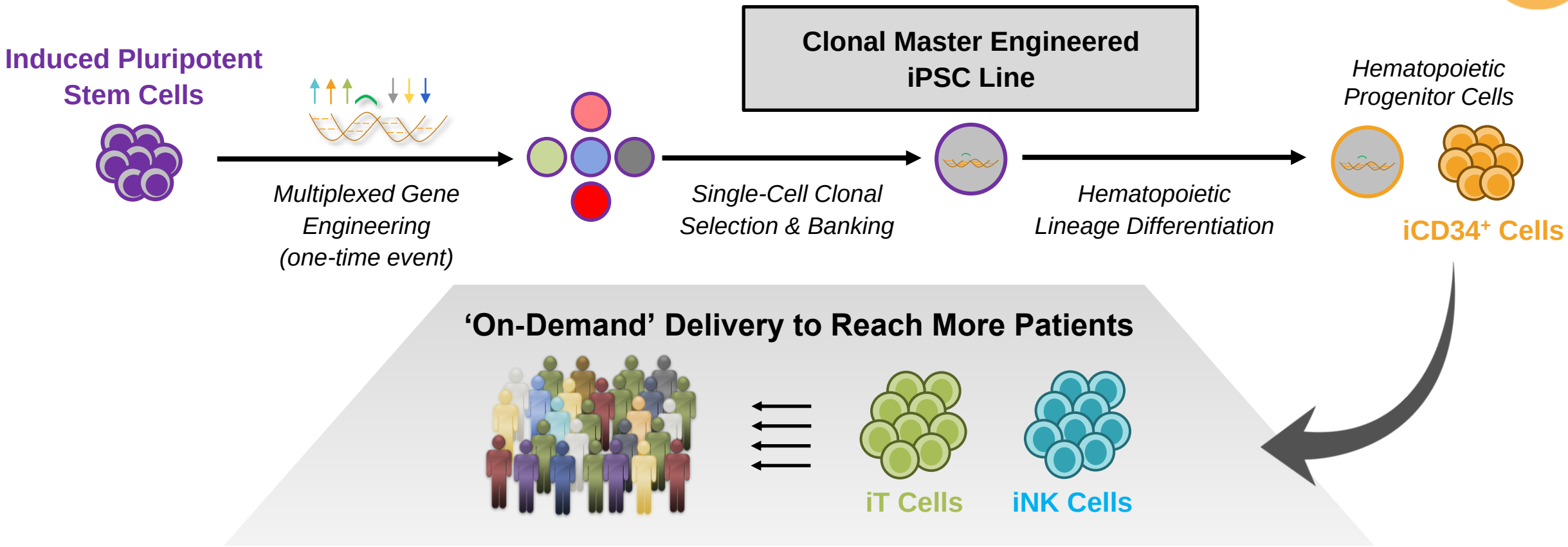
Off-the-Shelf Cell-based Cancer Immunotherapy

iPSC Product Platform for Mass Production of Universal NK Cell and T-Cell Products



Clonal master iPSC lines are a renewable cell source that can be repeatedly used to mass-produce homogeneous, cryopreserved cell product in a cost-effective manner

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Off-the-Shelf Cell-based Cancer Immunotherapy

Systematic Build of Industry-Leading iPSC-derived NK Cell Product Pipeline

Universal, Off-the-Shelf NK Cell Cancer Immunotherapy Pipeline

Clonal Master iPSC Line	Synthetic Biology	FT500	FT516	FT596	FT538	FT576
Multi-faceted Innate Immunity		✓	✓	✓	✓	✓
+ High-Affinity, Non-cleavable 158V CD16	*Augment mAb therapy*		✓	✓	✓	✓
+ IL-15 Receptor Fusion	*Enhance NK cell function*			✓	✓	✓
+ CAR Insertion	*Target tumor-associated antigen*			CD19		BCMA
+ CD38 Knock-out	*Resist CD38-mediated fratricide*				✓	✓
	Total # of Synthetic Elements	**0**	**1**	**3**	**3**	**4**

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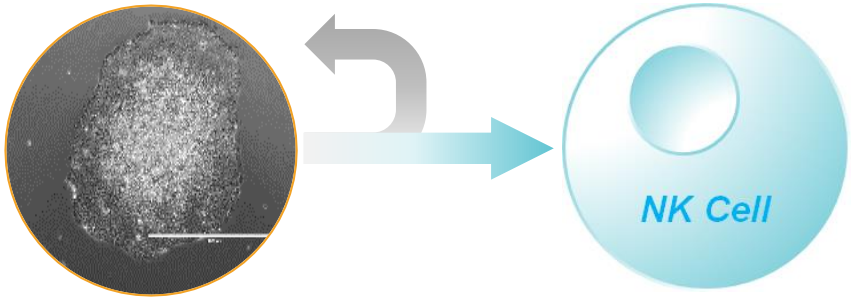
FT500 Universal, Off-the-Shelf NK Cell Product Candidate

Multi-faceted Innate Immune Function

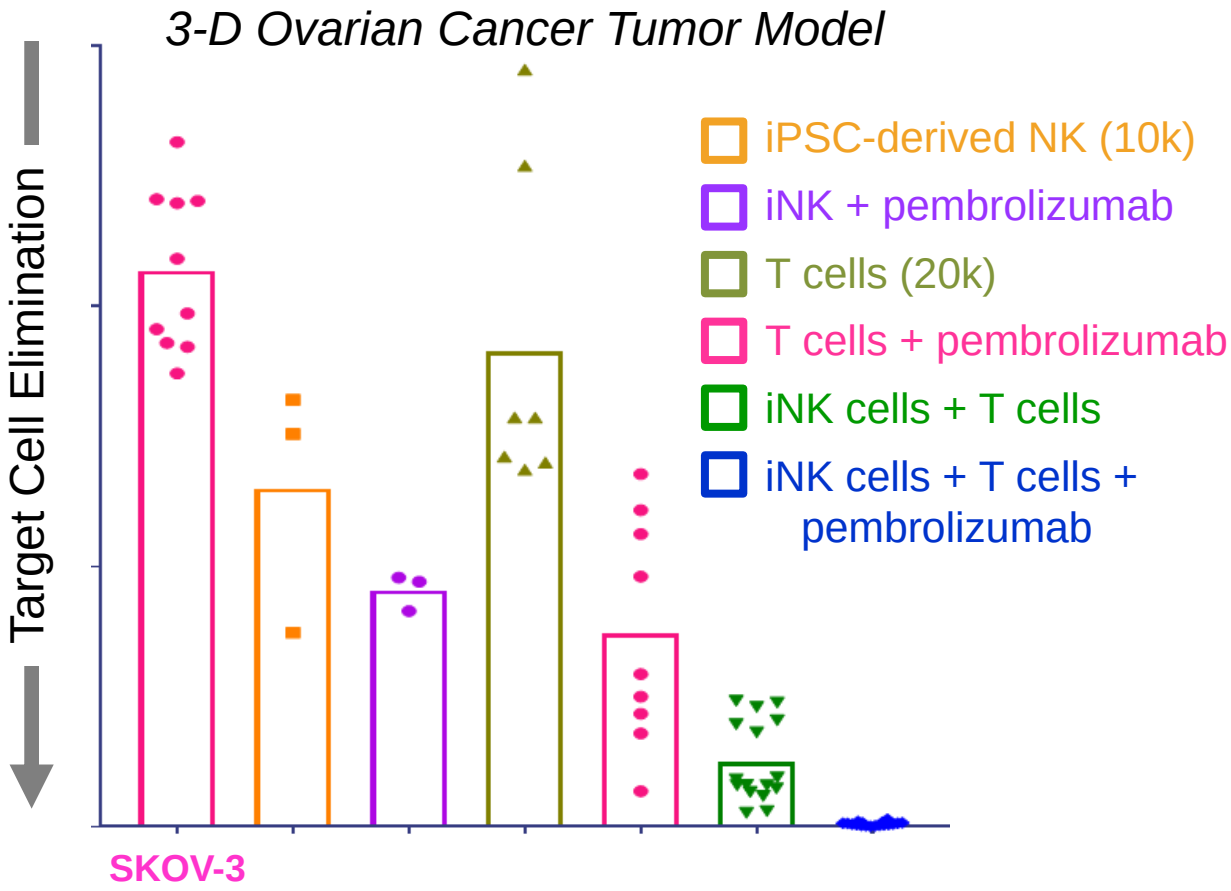


Master iPSC Line **FT500**

- High levels of expression of potent activating receptors (NKG2D, NKp30/40/46)
- High levels of secretion of cytolytic proteins (perforin and granzyme B)
- Low levels of expression of checkpoint receptors (PD-1, LAG-3 and TIGIT)

Target cell recognition via stress ligands and non-self MHC-I expression

Bridging Innate and Adaptive Immunity



FT500 Universal, Off-the-Shelf NK Cell Product Candidate

100s of Cryopreserved Doses in Single GMP Campaign from Master iPSC Line

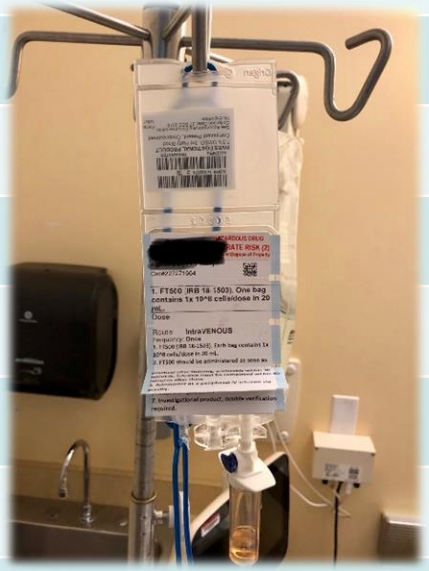
Low-cost per Dose GMP Production of Homogeneous Cell Product

GMP Manufacturing Site

Molecular and Cellular Therapeutics

University of Minnesota

FT500 Cell Product	
Identity, CD45+	100%
Identity, CD45+CD56+	98%
Viability	80%
Residual iPSCs	Not detected
Packaging	Cryopreserved
Storage	Clinical sites
Administration	Thaw-and-infuse ‘on demand’
Delivery	Outpatient setting



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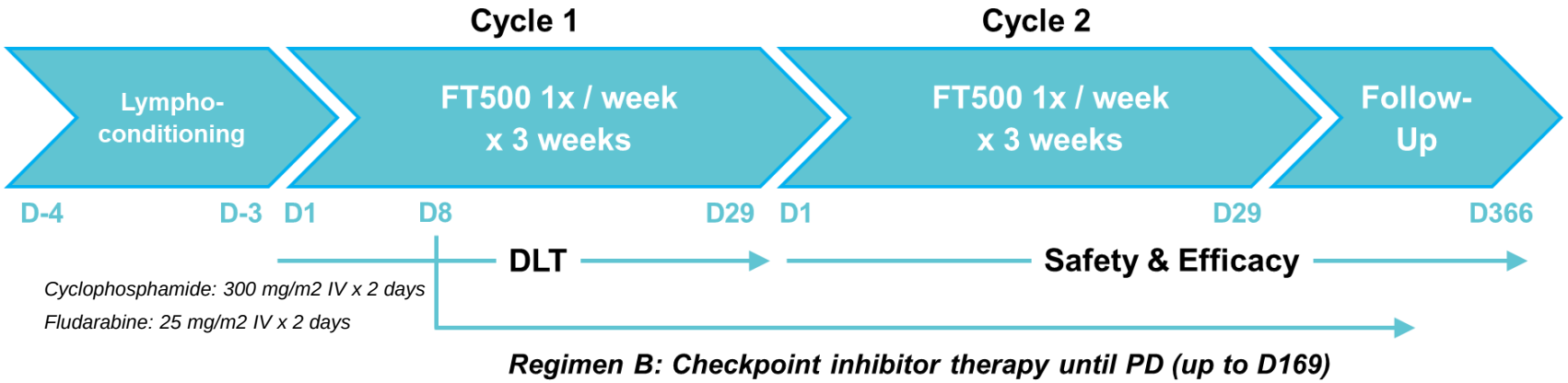
FT500 Universal, Off-the-Shelf NK Cell Product Candidate

Phase 1 Study Design: Multiple Doses over Multiple Cycles for Advanced Solid Tumors

First-ever Clinical Trial in U.S. of iPSC-derived Cell Therapy



Regimen A – Monotherapy*

- Salvage therapy for advanced solid tumors
- Dose Escalation: 100M and 300M cells per dose
- Dose Expansion: up to 10 subjects

Regimen B – Checkpoint Inhibitor (CPI) Combination*

- Progressed or failed CPI for advanced solid tumors
- Dose Escalation: 100M and 300M cells per dose + CPI
- Dose Expansion: up to 30 subjects

KEYTRUDA® (pembrolizumab) Injection 100 mg OPDIVO® (nivolumab) TECENTRIQ® atezolizumab

*If a CR, PR or SD ≥ 24 weeks is observed, up to 10 subjects with that specific tumor type may be added to Dose Expansion

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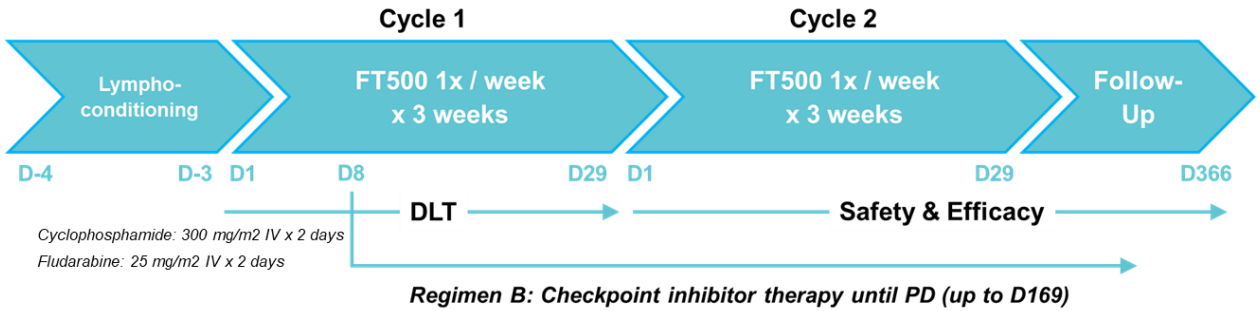
FT500 Universal, Off-the-Shelf NK Cell Product Candidate

Phase 1 Study Design: Multiple Doses over Multiple Cycles for Advanced Solid Tumors

First-ever Clinical Trial in U.S. of iPSC-derived Cell Therapy



Regimen A – Monotherapy

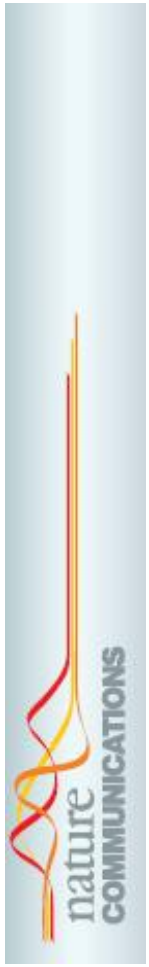
- DL1 = 100M cells per dose (n=3)
  - All 3 subjects received 6 doses
  - No reported DLTs
- DL2 = 300M cells per dose
  - Subjects treated

Regimen B – Checkpoint Inhibitor (CPI) Combination

- DL1 = 100M cells per dose
  - Subjects treated

FT500 Patient Enrichment Strategy in CPI Resistant Patients

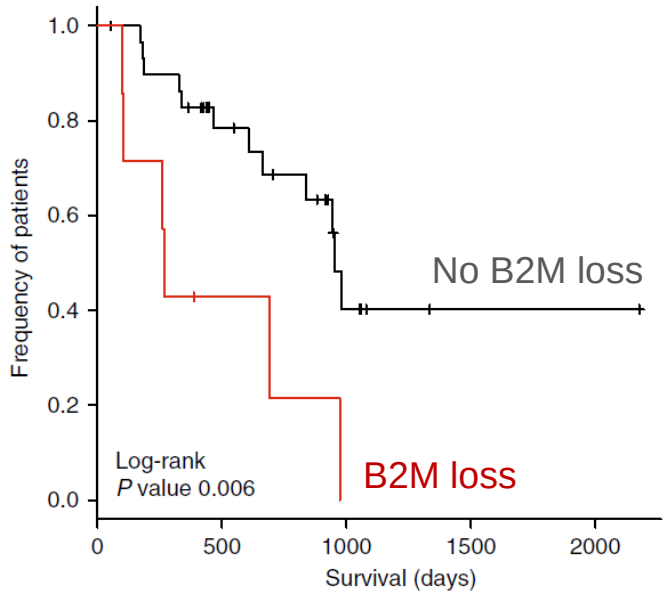
Regimen B: Rescue Therapy for Patients with Loss-of-Function Mutations



DOI: 10.1038/s41467-017-01062-w

Resistance to checkpoint blockade therapy through inactivation of antigen presentation

Survival



- ✓ MHC Class I expression on tumor cells is required for detection and destruction by T cells
- ✓ Loss or down-regulation of MHC Class I is a major tumor escape mechanism in solid tumors
- ✓ MHC Class I null tumor cells are highly susceptible to killing by NK cells
- ✓ Several tumor cell mutations, including in B2M gene, disrupt MHC Class 1 expression
- ✓ B2M mutations are enriched in patients who are resistant to checkpoint blockage (~30%) and are associated with poor survival

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FT500 Universal, Off-the-Shelf NK Cell Product Candidate

Phase 1 Study: Key Objectives

Proprietary Learnings Accruing to our iPSC-derived Product Pipeline

- **Safety**
  - First-ever iPSC-derived cell therapy to undergo clinical investigation in U.S.
  - Regimen B includes novel combination of iPSC-derived NK cell with checkpoint inhibitor therapy
- **Tolerability**
  - Off-the-shelf, cryopreserved, thaw-and-infuse (unmatched) cell product
  - Multiple doses over multiple cycles (3 doses per cycle; 2 cycles) administered in outpatient setting
- **Biomarkers**
  - Dose durability, including variance over dosing schedule
  - Anti-cell immunogenicity
  - FT500 infiltration of tumor / tumor remodeling
  - Endogenous T-cell and cytokine response
- **Patient Conditioning**
  - Lympho-conditioning regimen
  - Cytokine support

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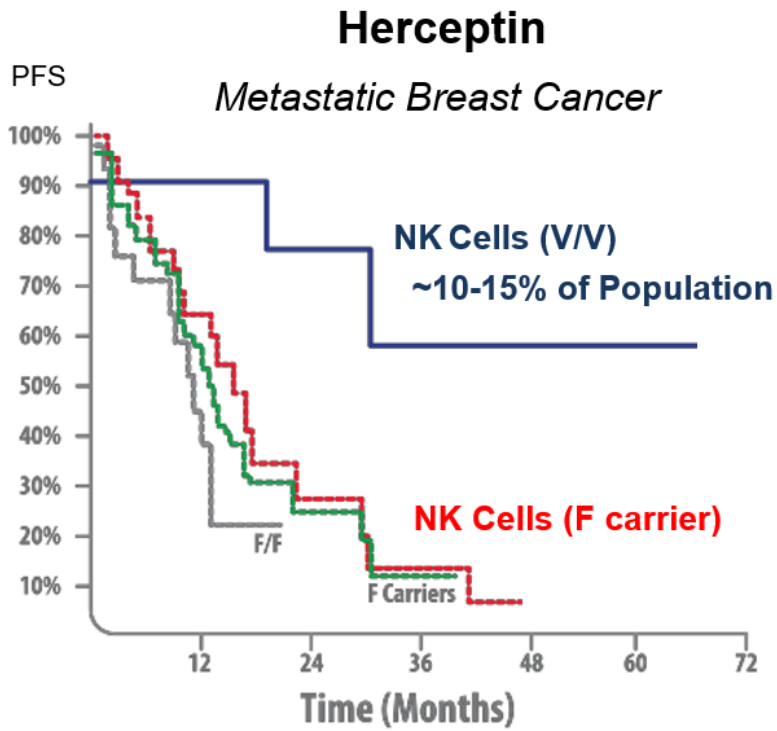
FT516 NK Cell Expression of Naturally-Occurring CD16

Fc Receptor Mediates Antibody-Dependent Cellular Cytotoxicity (ADCC)

- CD16 mediates antibody-dependent cellular cytotoxicity (ADCC), a potent anti-tumor mechanism by which NK cells recognize, bind and kill antibody-coated cancer cells
- CD16 occurs in two variants: high (158V) or low (158F) affinity for the Fc domain of IgG1 antibodies
  - Only ~15% of patients are homozygous for 158V
  - Numerous clinical studies with FDA-approved tumor-targeting antibodies, including rituximab, trastuzumab and cetuximab, have demonstrated that patients homozygous for 158V have improved clinical outcomes
- CD16 has been shown to undergo considerable down-regulation in cancer patients and shedding in the tumor microenvironment, which can significantly limit endogenous NK cell activity and inhibit anti-tumor activity



Musolino et al, J. Clin Oncol, 26, 1789, 2008

How to bring the 158V CD16 NK cell experience to all patients?

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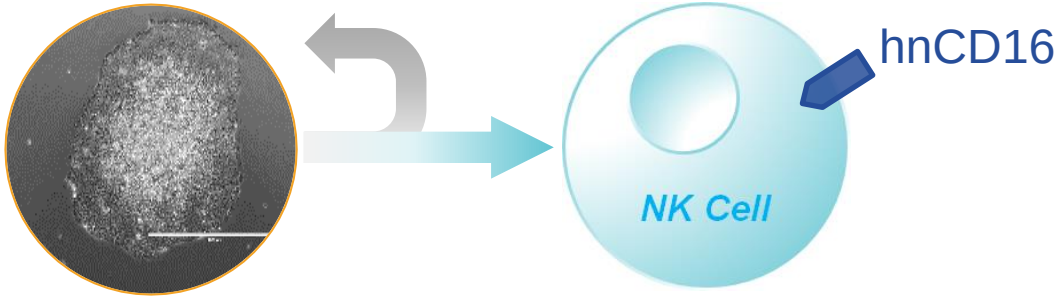
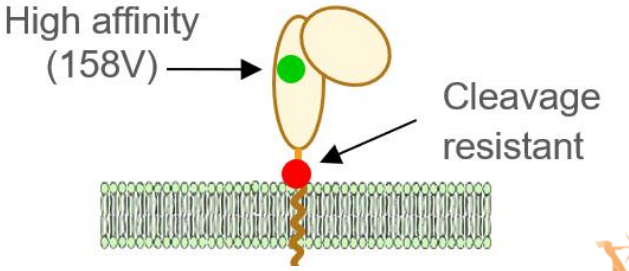
FT516 Universal, Off-the-Shelf hnCD16 NK Cell Product Candidate

High-Affinity 158V Engagement with Monoclonal Antibody for Enhanced ADCC



Engineered Master iPSC Line

FT516 + mAb



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

Rituxan Rituximab

DARZALEX (daratumumab)

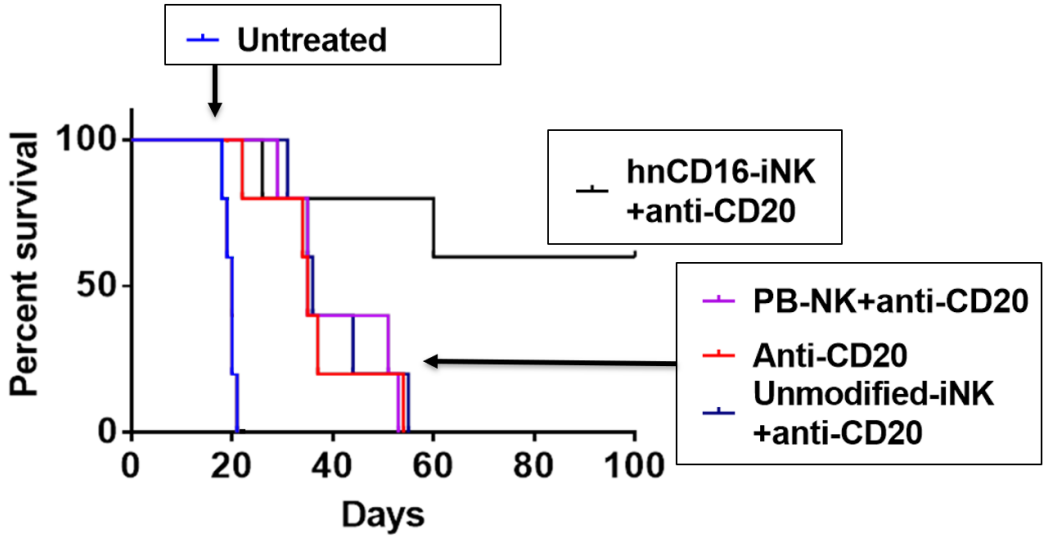
Herceptin trastuzumab

ERBITUX Cetuximab

AVASTIN bevacizumab

Enhanced Survival *In Vivo* with Rituximab

Mouse model of human lymphoma (Raji cells)



Median survival time for FT516 + anti-CD20 was not reached at Day 100

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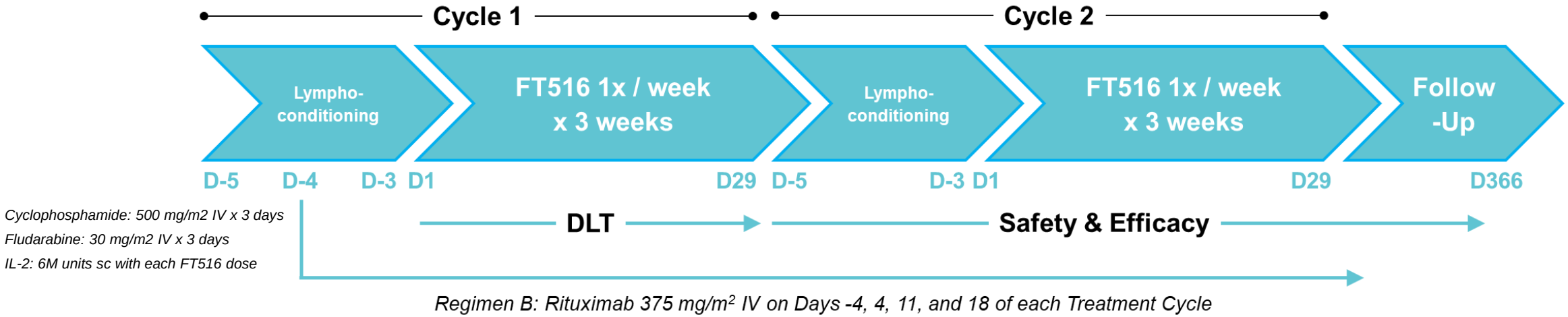
FT516 Universal, Off-the-Shelf hnCD16 NK Cell Product Candidate

Phase 1 Study Design: Multiple Doses over Multiple Cycles for AML & Lymphoma

First-ever Clinical Trial in World of Engineered iPSC-derived Cell Therapy



Cyclophosphamide: 500 mg/m2 IV x 3 days
Fludarabine: 30 mg/m2 IV x 3 days
IL-2: 6M units sc with each FT516 dose

Regimen B: Rituximab 375 mg/m^2 IV on Days -4, 4, 11, and 18 of each Treatment Cycle

Regimen A – Monotherapy

- Relapsed / refractory AML
- Dose Escalation: 90M, 300M, 900M cells per dose
- Dose Expansion: up to 15 subjects

Regimen B – Rituximab Combination Rituxan Rituximab

- Relapsed / refractory B-cell lymphoma
- Dose Escalation: 30M, 90M, 300M, 900M cells per dose + mAb
- Dose Expansion: up to 15 subjects

IND Allowed, FT516 Manufacture Complete, Preparing for First Patient

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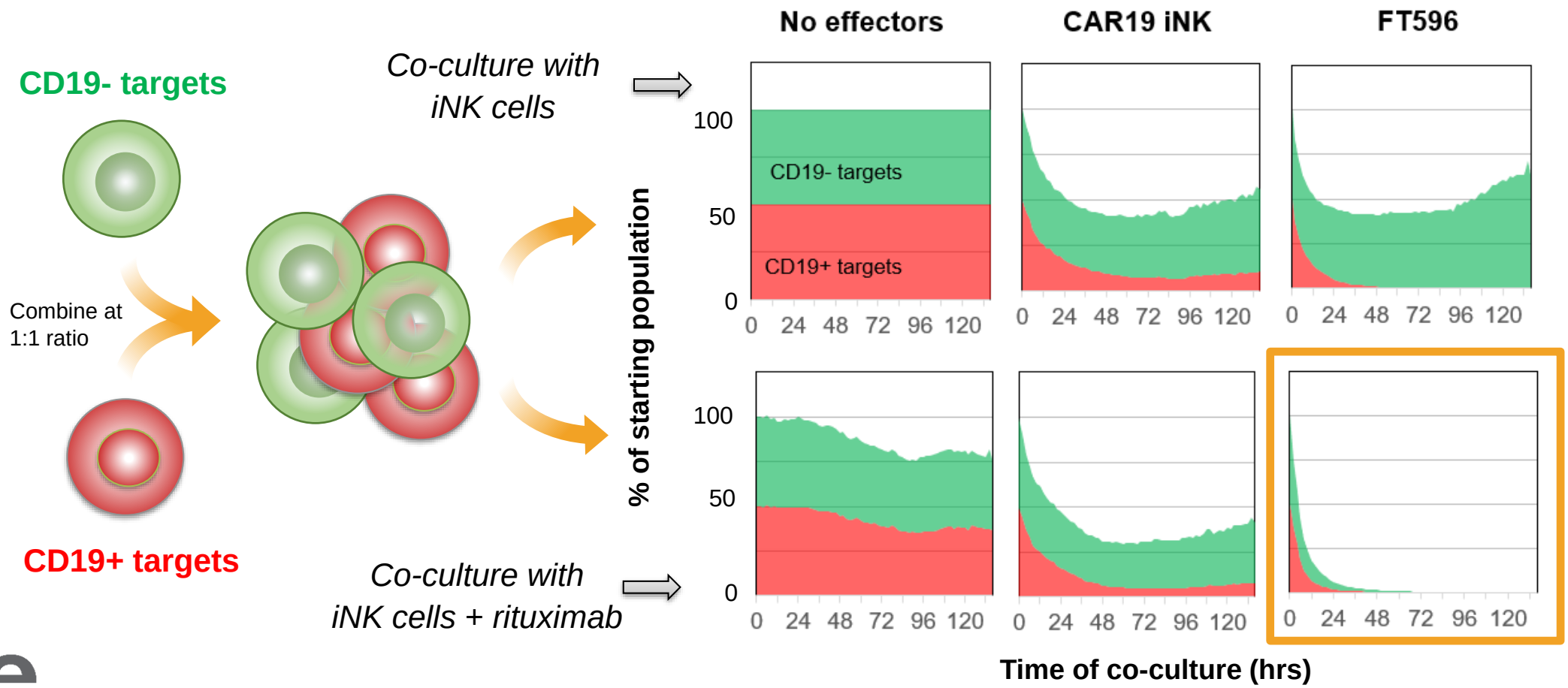
Targeting Multiple Tumor-associated Antigens

Leveraging hnCD16 + CAR to Address Tumor Heterogeneity and Antigen Escape

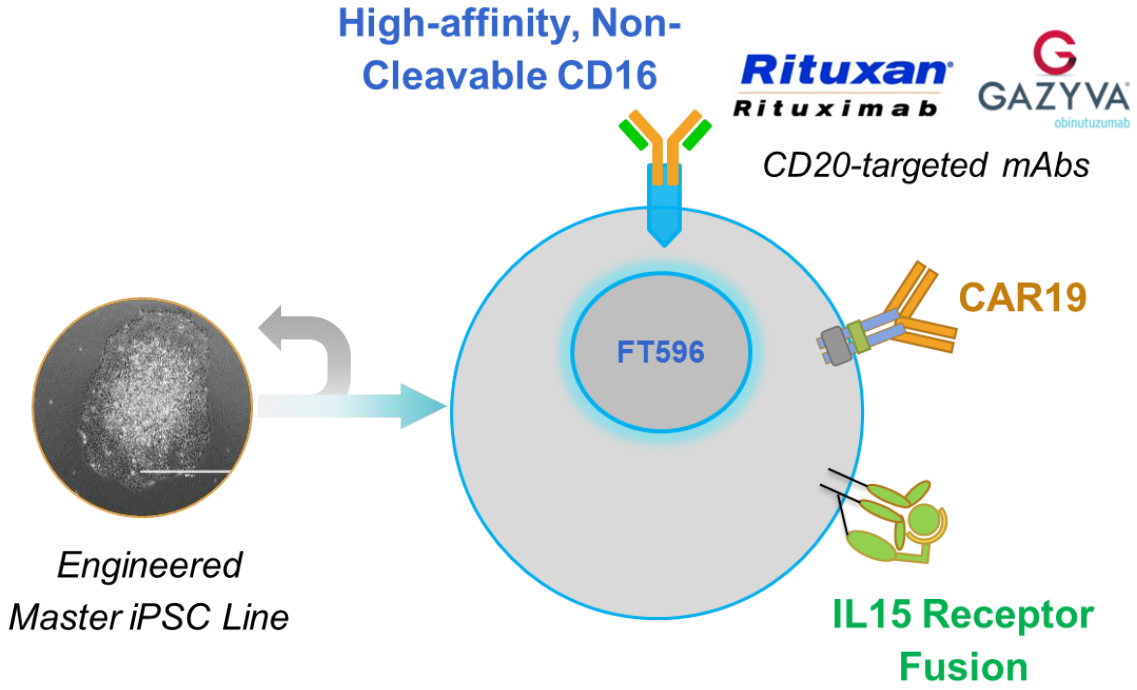
Proprietary approach to drive deeper, more durable responses



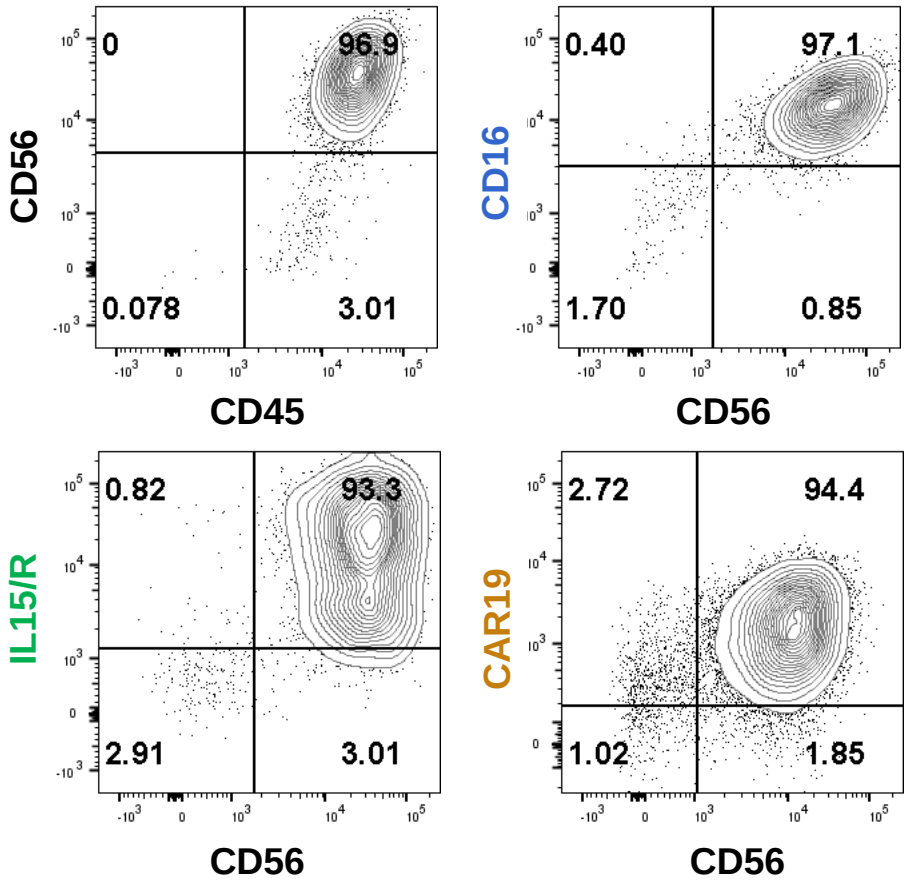
FT596 Universal, Off-the-Shelf Multi-Targeted CAR19 NK Cell Product

Potential Best-in-Class Product for B-cell Malignancies

Three Synthetic Elements: hnCD16 + CAR19 + IL15RF



Uniformly Engineered Product Profile

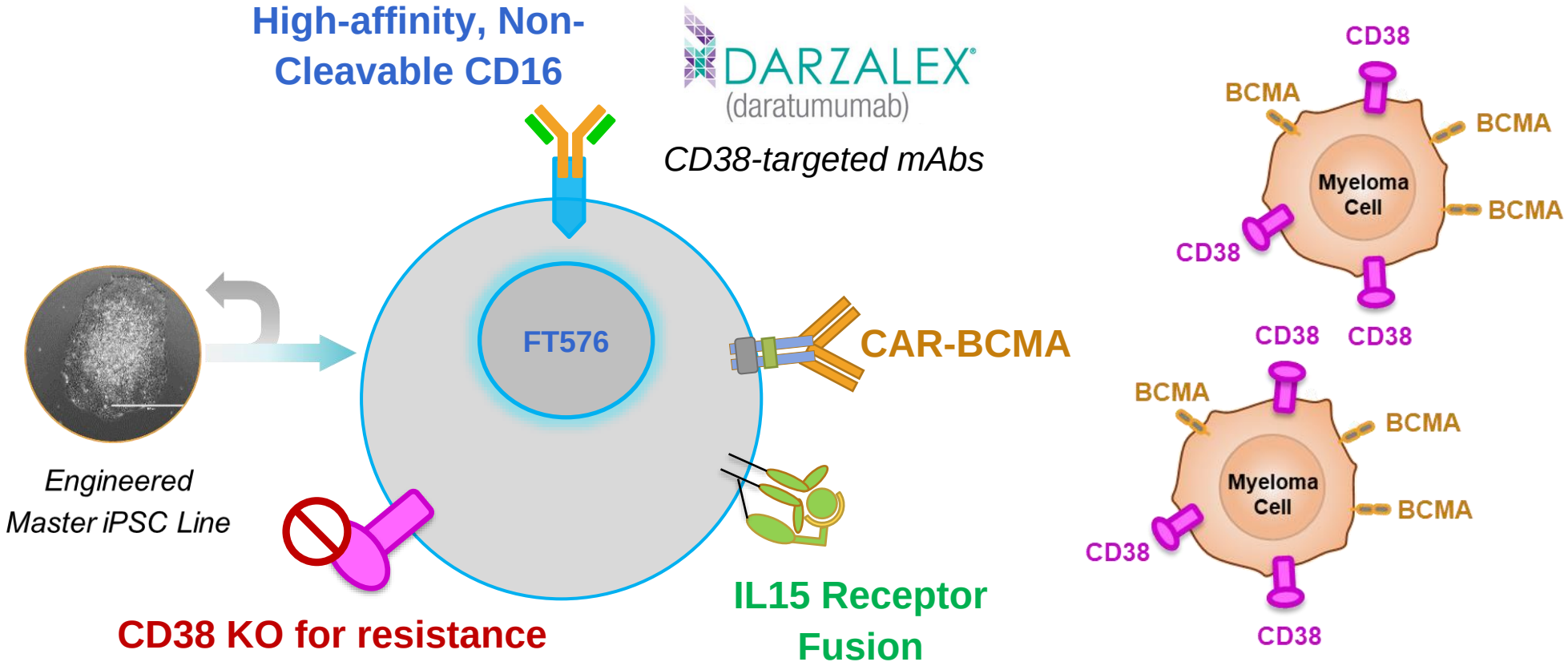


Planned IND Submission for Mid-2019

FT576 Universal, Off-the-Shelf Multi-Targeted CAR-BCMA NK Cell Product

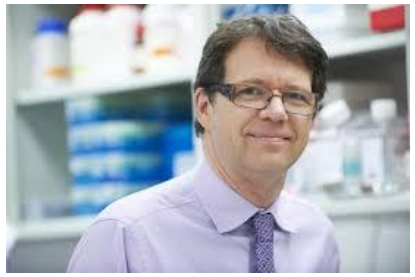
Potential Best-in-Class Product for Multiple Myeloma

Four Synthetic Elements: hnCD16 + CAR-BCMA + IL15RF + CD38KO



Universal, Off-the-Shelf CAR T-Cell Product Candidates

Memorial Sloan Kettering Collaboration



Dr. Michel Sadelain, MD, PhD

Director, Center for Cell Engineering
Memorial Sloan Kettering Cancer Center

LETTERS

nature biotechnology

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

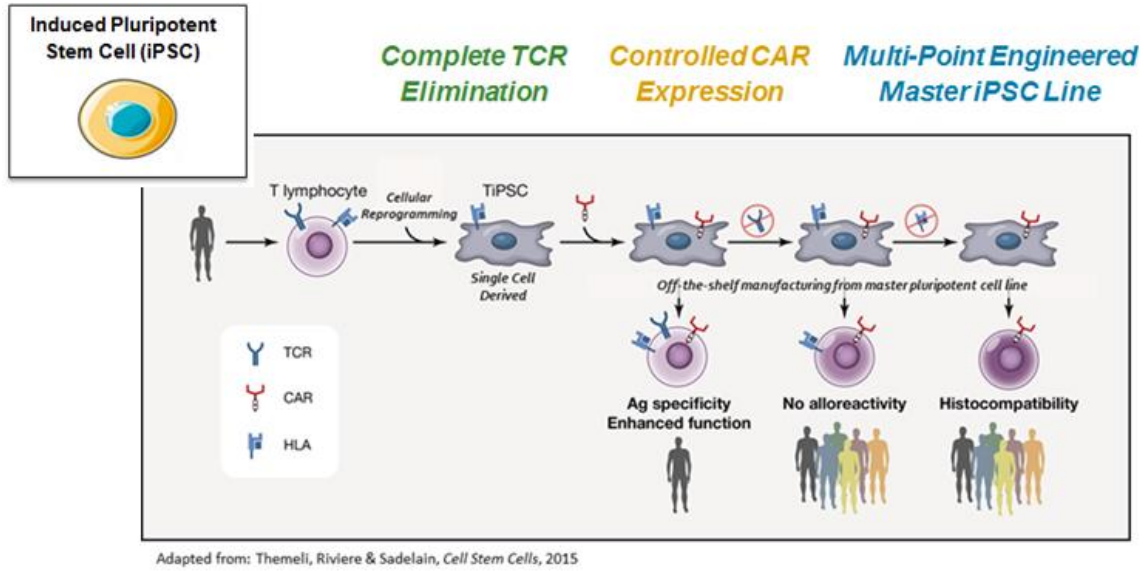
Cell Stem Cell

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."



Adapted from: Themeli, Riviere & Sadelain, *Cell Stem Cells*, 2015

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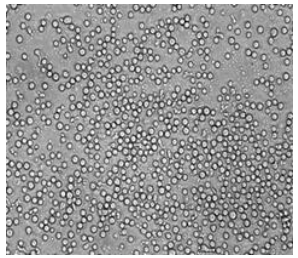
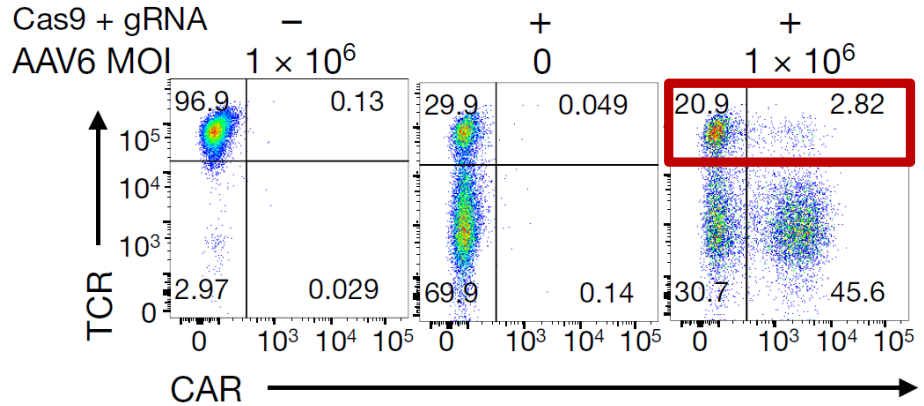
FT819 TRAC-encoded CAR 1XX Expression

Engineering Primary T Cells vs. Single iPSC Clone for TCR Elimination

CRISPR Engineering: TCR Disruption + TRAC-encoded CAR Expression

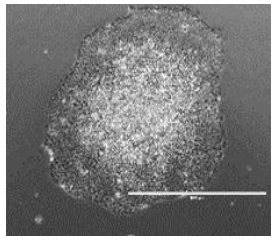
Primary T Cell Batch



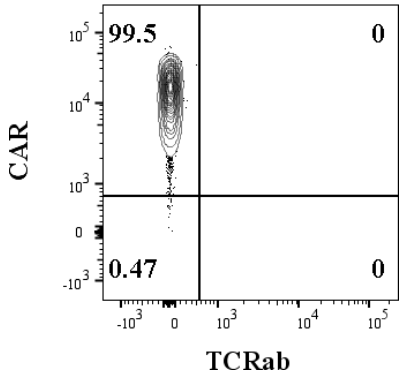


- ✓ **20% of T cells express allo-reactive TCR**
- ✓ **Only 45% of T cells have TCR KO + CAR expression**

Single iPSC Clone



CAR-iT cell Profile

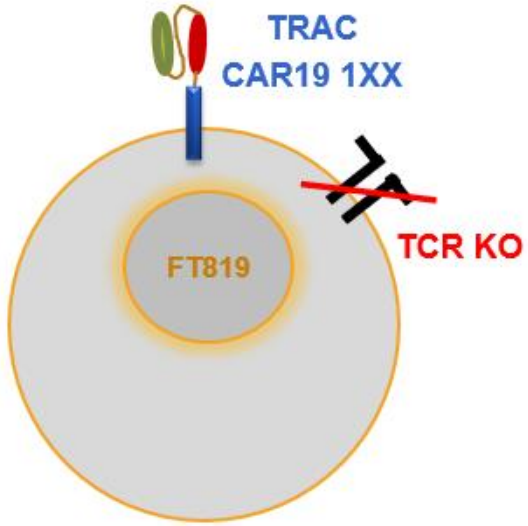


- ✓ **Complete elimination of TCR expression**
- ✓ **Uniform and controlled CAR expression through TRAC**

FT819 Universal, Off-the-Shelf CAR19 T-Cell Product

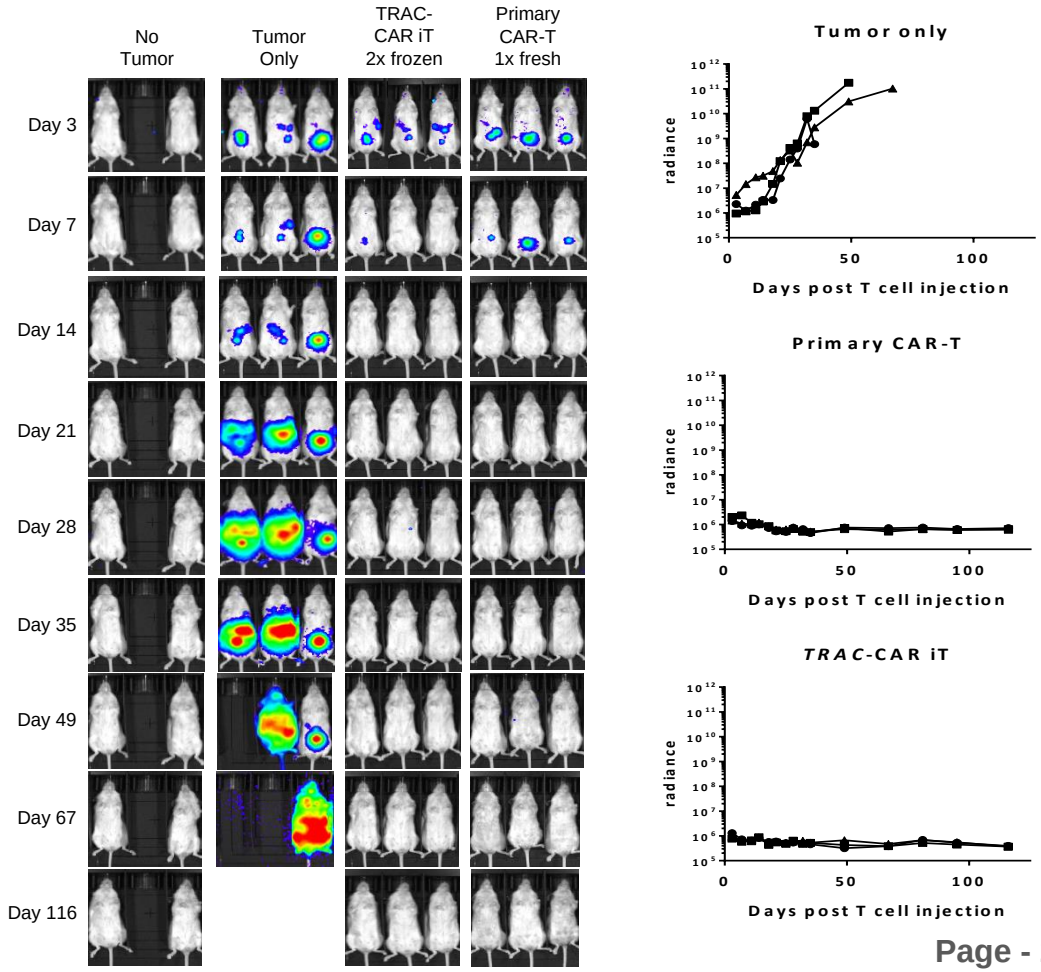
Novel CAR19 Targeted to the TRAC Locus for Improved Safety and Efficacy

Engineered CAR19 (1XX MSKCC) + TCR KO



- ✓ Novel CAR (MSKCC, 1XX) targeted to the TRAC locus for optimal activity
- ✓ Single cell derived, bi-allelic KO, iPSC clone for complete elimination of TCR mediated GvHD

Directly-infused *In Vivo* Anti-Tumor Activity



ONO Pharmaceutical Collaboration

Off-the-Shelf iPSC-derived CAR T-Cell Product Candidates

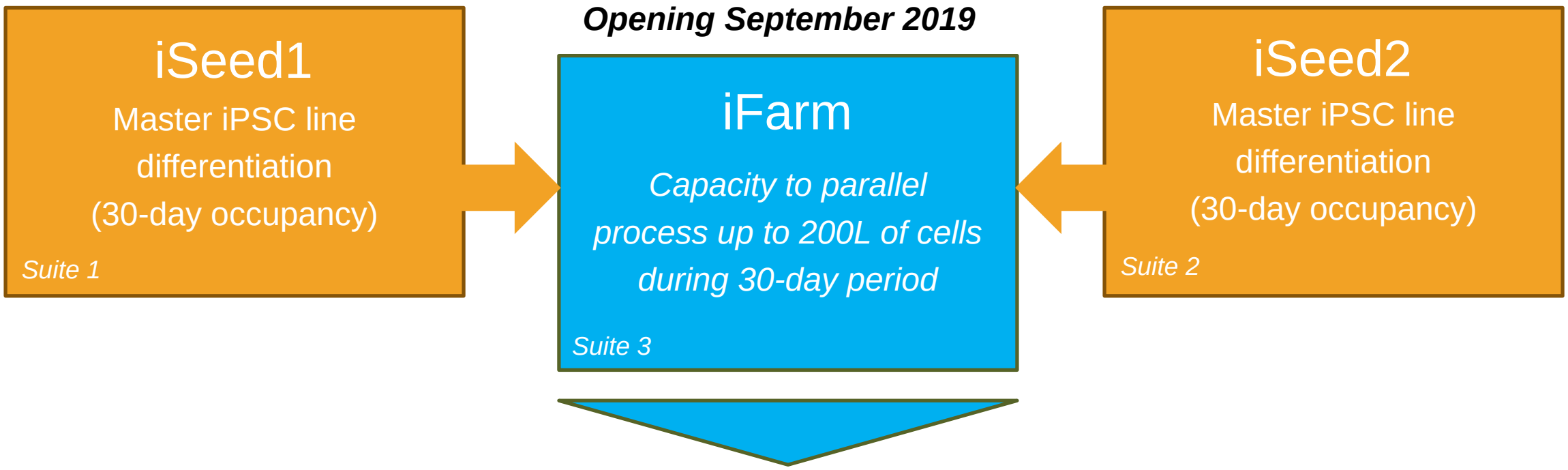
	Product 1 CAR T-cell targeting Antigen "ND"	Product 2 CAR T-cell targeting Antigen "ND"
Tumor Type	Lymphoblastic leukemia	Solid tumor
Binding Domain	FATE to contribute	ONO to contribute
Preclinical Funding	Up to $70M, including $10M upfront plus $20M in committed research funding and up to an additional $40M in contingent fees	
ONO Rights (subject to Preclinical Option Exercise)	Asia only	WW with FATE having opt-in right to develop and commercialize in the U.S. and Europe under a 50-50 profit-sharing arrangement
Post-Option Economics	Up to $285M in clinical development, regulatory and sales milestones plus royalties	Up to $895M in clinical development, regulatory and sales milestones plus royalties

ND = Not publicly disclosed

Mass Production of iPSC-derived Cellular Immunotherapies

Design of In-house Manufacturing Facility

A simple, scalable and modular GMP facility to support cost-effective production of multiple product candidates in parallel



~600 doses, across 1-2 product candidates, per month

iPSC Product Platform

Clonal Master iPSC Lines for Off-the-Shelf Cell Products

Single iPSC Clone

(Engineered) Single Pluripotent Stem Cell

- *Renewable*
- *Potential to differentiate into 200+ cell types*

Expansion & Banking

Unlimited Supply of Clonal Master iPSC Lines

Master Cell Bank → Working Cell Banks; Working Cell Banks; Working Cell Banks

Differentiation & Expansion

Thousands of Clonally-derived Doses of Cell Products

T Cell

Off-the-Shelf
Homogeneous | Multi-Dosing
(Engineered) Cell Products

NK Cell

"to reach more patients in need"

Fate THERAPEUTICS

Next-Generation Cell-based Cancer Immunotherapy

Therapeutic Vision for Long-Term Durable Responses

Intervention Strategy	Profile of Next-Generation Cell Products
Early	• **Differentiated safety profile** • **Well-tolerated regimens**
Often	• **Multi-dose, multi-cycle treatments** • **Cost-effective manufacture**
Combinations	• **Augment established agents' MOA** • **Incorporate and deliver multiple MOAs**

Fate THERAPEUTICS

Financial Summary

As of March 31, 2019

Three Months Ended March 31, 2019	
Revenue	$2.6M
Operating Expense, Adjusted [1]	$19.2M
Cash & Cash Equivalents	$183.5M
Employees	125
Total Shares Outstanding [2]	79.3M

[1] Excludes non-cash stock-based compensation expense of approximately $3.9M.

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

Fate THERAPEUTICS

Better Cells For Better Therapies™