Off-the-shelf Cell-based Cancer Immunotherapy

Developing First-of-kind Cell Products using Clonal Master iPSC Lines

June 2020

www.fatetherapeutics.com
Forward-Looking Statements

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Patient-derived CAR-T Cell Immunotherapy

First Innings of Cell Therapy Development

Impaired Starting Material | Random & Variable Engineering | Complex Logistics
Heterogeneous Drug Product | Expensive | Single-dose Limitation

"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
# Changing the Game in Cell-based Cancer Immunotherapy

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

<table>
<thead>
<tr>
<th>Key Features</th>
<th>Cell Therapy 1.0 and 2.0</th>
<th>Cell Therapy 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Source</td>
<td>Patient and Donor Cells</td>
<td>Renewable Master Cell Line</td>
</tr>
<tr>
<td>Genetic Engineering</td>
<td>Random &amp; Variable</td>
<td>Uniform &amp; Complete</td>
</tr>
<tr>
<td>Characterization</td>
<td>Imprecise</td>
<td>Well-defined</td>
</tr>
<tr>
<td>Product Identity</td>
<td>Heterogeneous</td>
<td>Homogeneous</td>
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<tr>
<td>Manufacturing</td>
<td>Limited Dose Availability</td>
<td>Off-the-Shelf Availability</td>
</tr>
<tr>
<td>Cost-per-Dose</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Dosing</td>
<td>Single Dose</td>
<td>Multiple Doses / Multiple Cycles</td>
</tr>
<tr>
<td>Overall Paradigm</td>
<td>Process-centric</td>
<td>Product-centric</td>
</tr>
</tbody>
</table>
Unique Advantages of Human iPSCs

Single-cell Isolation, Characterization & Selection

A Single Human Induced Pluripotent Stem Cell (iPSC)
A renewable source for making cell products

- Unlimited Clonal Expansion
- Multiplexed Engineering
- Extensive Characterization
- Single iPSC Clone
- Potential to Differentiate into 200+ Cell Types
- Master Cell Lines and Banks
- Uniform in Composition

Fate Therapeutics’ iPSC product platform is supported by an IP portfolio of 300+ issued patents and 150+ pending patent applications
iPSC Product Platform
Disruptive Approach Enabling Mass Production of Universal NK Cell and T-Cell Products

Induced Pluripotent Stem Cells

Multiplexed Gene Engineering (one-time event)

Single-Cell Sorting & Clonal Selection

iPSC Expansion & Banking

Clonal Master Engineered iPSC Bank

‘On-Demand’ Delivery to Reach More Patients

iT Cells

iNK Cells

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.
# iPSC Product Platform

## Ownership and Full Control of cGMP Manufacturing

<table>
<thead>
<tr>
<th>FT500 Cell Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identity, CD45+</td>
</tr>
<tr>
<td>Identity, CD45+CD56+</td>
</tr>
<tr>
<td>Viability</td>
</tr>
<tr>
<td>Residual iPSCs</td>
</tr>
<tr>
<td>Packaging</td>
</tr>
<tr>
<td>Availability</td>
</tr>
<tr>
<td>Administration</td>
</tr>
<tr>
<td>Delivery</td>
</tr>
</tbody>
</table>

- **Uniformly-engineered cell product**
- **Cryopreserved with high post-thaw viability**
- **Potential for thousands of doses per campaign**
- **Low-cost per dose cGMP production**
- **On-demand availability for broad patient accessibility**

Launch First Facility in 3Q19 / Second Facility Under Construction
iPSC-derived NK Cell Franchise
### Off-the-Shelf, iPSC-derived Cell-based Cancer Immunotherapy Franchise

<table>
<thead>
<tr>
<th>Product</th>
<th>Cell Type</th>
<th>Engineered Functionality</th>
<th>Indication</th>
<th>R&amp;D</th>
<th>Preclinical</th>
<th>Clinical</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hematologic Malignancies</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT516</td>
<td>iNK</td>
<td>hnCD16</td>
<td>AML</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT516</td>
<td>iNK</td>
<td>hnCD16</td>
<td>BCL + mAb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT596</td>
<td>iNK</td>
<td>hnCD16 + IL15-RF + CAR19</td>
<td>BCL and CLL ± mAb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT638</td>
<td>iNK</td>
<td>hnCD16 + IL15-RF + CD38-KO</td>
<td>AML</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT538</td>
<td>iNK</td>
<td>hnCD16 + IL15-RF + CD38-KO</td>
<td>MM + mAb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT576</td>
<td>iNK</td>
<td>hnCD16 + IL15-RF + CD38-KO + CAR-BCMA</td>
<td>MM ± mAb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT819</td>
<td>IT</td>
<td>TRAC-targeted CAR19 + TCR-KO</td>
<td>Hematologic Malignancies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Advanced Solid Tumors</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FT500</td>
<td>iNK</td>
<td>Non-engineered</td>
<td>Advanced Solid Tumors + CPB</td>
<td></td>
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<tr>
<td>FT516</td>
<td>iNK</td>
<td>hnCD16</td>
<td>Advanced Solid Tumors + mAb</td>
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<td></td>
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<tr>
<td>FT###</td>
<td>iNK and IT</td>
<td>Multiplexed engineered CAR-MICA/B</td>
<td>Advanced Solid Tumors</td>
<td></td>
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<tr>
<td><strong>Cancer Immunotherapy Collaborations</strong></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Janssen</td>
<td>iNK and IT</td>
<td>Multiplexed engineered CAR-targeted</td>
<td>Up to 4 cancer antigens</td>
<td></td>
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<tr>
<td>ONO</td>
<td>IT</td>
<td>Multiplexed engineered CAR-targeted</td>
<td>Up to 2 cancer antigens</td>
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</table>

**Abbreviations:**
- **iPS** = induced pluripotent stem cell
- **INK** = iPSC-derived NK cell
- **IT** = iPSC-derived T cell
- **hnCD16** = high-affinity, non-cleavable CD16 Fc receptor
- **IL15-RF** = IL-15/IL-15 receptor fusion
- **CD38-KO** = CD38 knock-out
- **CAR** = chimeric antigen receptor
- **mAb** = monoclonal antibody
- **CPB** = checkpoint blockade therapy
- **AML** = Acute myelogenous leukemia
- **BCL** = B-cell lymphoma
- **CLL** = Chronic lymphocytic leukemia
- **MM** = Multiple myeloma

**Note:** This table represents a subset of the iPSC-derived cell-based cancer immunotherapy franchise, highlighting the diversity in engineered functionalities and indications for both hematologic and advanced solid tumors.
### Universal, Off-the-Shelf NK Cell Cancer Immunotherapy Pipeline

<table>
<thead>
<tr>
<th>Clonal Master iPSC Line</th>
<th>Synthetic Biology</th>
<th>FT500</th>
<th>FT516</th>
<th>FT596</th>
<th>FT538</th>
<th>FT576</th>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<td>+ High-Affinity, Non-cleavable CD16</td>
<td>Augment mAb therapy</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>+ IL-15 Receptor Fusion</td>
<td>Enhance NK cell function</td>
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<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
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<tr>
<td>+ CAR Insertion</td>
<td>Target tumor-associated antigen</td>
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<td>CD19</td>
<td></td>
<td></td>
<td>BCMA</td>
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<td>+ CD38 Knock-out</td>
<td>Resist CD38-mediated fratricide</td>
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<td>3</td>
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<td>4</td>
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</tbody>
</table>

**Six INDs Allowed by FDA for FT500, FT516, FT596 and FT538**

**IND Submission for FT576 Planned for 4Q20**
FT500 Off-the-Shelf NK Cell Product Candidate

Assessment of Safety & Tolerability of Novel Cell Therapy Treatment Paradigm

Assess Novel Paradigm

- First-ever U.S. clinical study of iPSC-derived cell
- Universal starting material (e.g., no patient matching)
- Multi-dose, multi-cycle treatment strategy
- One-time, outpatient lympho-conditioning
- No exogenous cytokine support

Key Clinical Read-outs

- FT500 safety and tolerability (DLTs, AEs)
- Immune-mediated toxicities (GvHD, CRS)

Key Molecular Read-outs

- Immune cell recovery
- Endogenous cytokine response (GvHD, CRS)
- Anti-product immunogenicity
**FT500 Off-the-Shelf NK Cell Product Candidate**

*Phase 1 Dose Escalation in Advanced Solid Tumors*

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### Phase 1 Dose Escalation Design in Advanced Solid Tumors

**3 doses per cycle over 2 cycles**

- **Cy**: 300 mg/m² IV x 2 days
- **Flu**: 25 mg/m² IV x 2 days
  
  Prior to Cycle 1 only

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- **Regimen A**: Monotherapy
  - Salvage setting with patients having progressed or failed all FDA-approved therapies

- **Regimen B**: Combination with checkpoint inhibitor (CI) therapy
  - Tumor types where CIs are approved
  - Salvage setting with patients having progressed or failed CIs

- **Two dose levels**
  - 100M cells / dose and 300M cells / dose x up to 6 doses
### FT500 Phase 1 Dose Escalation – Key Clinical Read-outs

**Regimen A Monotherapy – Safety, Tolerability, Best ORR, and Disposition**

<table>
<thead>
<tr>
<th>Cohort / Cell Dose</th>
<th>Subject #</th>
<th># Lines of Prior Therapy</th>
<th>FT500 Doses Received</th>
<th>Safety</th>
<th>Disposition</th>
<th>Best Overall Response</th>
<th>Days on Study</th>
<th>Reason for Study Discontinuation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A1 100M cells / dose</strong></td>
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<td>3</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>SD</td>
<td>94</td>
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<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>iUPD</td>
<td>94</td>
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<tr>
<td></td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>SD</td>
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<tr>
<td><strong>A2 300M cells / dose</strong></td>
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<td>4</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>SD</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>SD</td>
<td>55</td>
</tr>
<tr>
<td></td>
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<td>2</td>
<td>3</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>iUPD</td>
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<tr>
<td></td>
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<td>4</td>
<td>6</td>
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<td>None</td>
<td>None</td>
<td>iUPD</td>
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<td>5</td>
<td>4</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>iUPD</td>
<td>90</td>
</tr>
</tbody>
</table>

* Per iRECIST  
SD = stable disease  
iUPD = immune unconfirmed progressive disease  
iCPD = immune confirmed progressive disease

As of 28 November 2019 data cutoff. Database is not locked and final data are subject to change.
## FT500 Phase 1 Dose Escalation – Key Clinical Read-outs

**Regimen B CI Combination – Safety, Tolerability, Best ORR, and Disposition**

<table>
<thead>
<tr>
<th>Cohort / Cell Dose</th>
<th>Subject #</th>
<th># Lines of Prior Therapy</th>
<th>FT500 Doses Received</th>
<th>Safety</th>
<th>Disposition</th>
<th>Days on Study</th>
<th>Reason for Study Discontinuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1&lt;sup&gt;a&lt;/sup&gt; 100M cells / dose</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>None</td>
<td>None</td>
<td>SD</td>
<td>76</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>SD</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>iUPD</td>
<td>85</td>
</tr>
<tr>
<td>B2&lt;sup&gt;b&lt;/sup&gt; 300M cells / dose</td>
<td>1</td>
<td>4</td>
<td>6</td>
<td>None</td>
<td>None</td>
<td>SD</td>
<td>On-study</td>
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<td>None</td>
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<td>3</td>
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<td>6</td>
<td>None</td>
<td>None</td>
<td>iUPD</td>
<td>72</td>
</tr>
</tbody>
</table>

* Per iRECIST  
SD = stable disease  
iUPD = immune unconfirmed progressive disease  
iCPD = immune confirmed progressive disease

---

<sup>a</sup> B1 As of 28 November 2019 data cutoff.  
<sup>b</sup> B2 Not included in 28 November 2019 data cutoff; as reported by investigator.  
Database is not locked and final data are subject to change.
FT500 Phase 1 Dose Escalation – Key Clinical Read-outs

Summary Findings

Treatment with Universal, Off-the-Shelf, iPSC-derived NK Cell Cancer Immunotherapy Showed Favorable Safety and Was Well Tolerated

As of a November 28, 2019 data cutoff:

- All patients received ≥3 doses of FT500 in outpatient setting
- No DLTs
- No FT500-related SAEs or Grade ≥3 AEs
- No immune-related AEs (e.g., CRS, neurotoxicity, or GVHD)
- No treatment discontinuations due to AEs
FT500 is a Universal, Off-the-Shelf, iPSC-derived NK Cell Cancer Immunotherapy administered with Multiple Doses to Patients without Matching

- Immune cell recovery
  - Do iNK cells negatively impact hematopoietic recovery following lympho-conditioning?

- Endogenous cytokine response
  - Is there molecular evidence of immunotoxicity (e.g., CRS, neurotoxicity and/or GvHD)?

- Anti-product immunogenicity
  - T-cell mediated: Do anti-product T-cell clones expand and become dominant?
  - B-cell mediated: Are anti-product antibodies raised?
**FT500 Phase 1 Dose Escalation – Key Molecular Read-outs**

**Summary Findings**

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**Administration of Multiple Doses of FT500 to Patients without Matching Was Safe and Well Tolerated without Eliciting Host Immune Rejection**

As of a November 28, 2019 data cutoff:

- Healthy endogenous immune cell recovery following multi-dose FT500 treatment
- No biomarker evidence of sub-clinical CRS, neurotoxicity, or GvHD
- Endogenous T-cell response to FT500 is not indicative of T-cell mediated immune rejection
- Anti-FT500 antibody assessment is not indicative of B-cell mediated immune rejection

*Outpatient lympho-conditioning regimen: Cy (300 mg/m²) x Flu (25 mg/m²) x 2 days prior to Cycle 1 only*

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As of 28 November 2019 data cutoff. Database is not locked and final data are subject to change.
FT500 Phase 1 Dose Expansion

Overcome Resistance to Checkpoint Inhibitor Therapy in Non-Small Cell Lung Cancer

Target Loss of MHC-I Tumor Escape Mechanism in Regimen B2 (n=15)

NK cells have the unique ability to recognize and kill cancer cells that have down-regulated MHC Class I, a major tumor escape mechanism.

- Loss or down-regulation of MHC Class I is a major tumor escape mechanism in patients having progressed / failed checkpoint inhibitor therapy.
- 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.
## Universal, Off-the-Shelf NK Cell Cancer Immunotherapy Pipeline

<table>
<thead>
<tr>
<th>Clonal Master iPSC Line</th>
<th>Synthetic Biology</th>
<th>FT500</th>
<th>FT516</th>
<th>FT596</th>
<th>FT538</th>
<th>FT576</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-faceted Innate Immunity</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>+ High-Affinity, Non-cleavable CD16</td>
<td>Augment mAb therapy</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>+ IL-15 Receptor Fusion</td>
<td>Enhance NK cell function</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>+ CAR Insertion</td>
<td>Target tumor-associated antigen</td>
<td>CD19</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ CD38 Knock-out</td>
<td>Resist CD38-mediated fratricide</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of Synthetic Elements</td>
<td></td>
<td>0</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
FT516 Off-the-Shelf hnCD16 NK Cell Product Candidate

**CD16 Fc Receptor Mediates Antibody-Dependent Cellular Cytotoxicity (ADCC)**

- CD16 is an activating receptor expressed on NK cells
  - 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 have demonstrated that patients homozygous for 158V have improved clinical outcomes

- CD16 shedding in the tumor microenvironment can significantly limit NK cell anti-tumor activity

**How to bring the 158V CD16 NK cell experience to all patients?**
FT516 Off-the-Shelf hnCD16 NK Cell Product Candidate

High-Affinity 158V, Non-Cleavable CD16 Fc Receptor for Enhanced ADCC

FT516

hnCD16

High-affinity, Non-Cleavable CD16

NK Cell

Engineered Master iPSC Line

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

FT516

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

Pluripotent stem cell–derived NK cells with high-affinity noncleavable CD16a mediate improved antitumor activity

Huang Zhu,1 Robert H. Blum,1 Ryan Bjordahl,1 Svetlana Gaidarova,1 Paul Rogers,2 Tom Tong Lee,3 Ramezy Abujurair,2 Gregory B. Bonello,2 Jianming Wu,1 Pei-Fang Tsai,2 Jeffrey S. Miller,1 Bruce Walcheck,1 Bahram Valamehr,7 and Dan S. Kaufman1

blood 6 FEBRUARY 2020
FT516 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

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

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

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
FT516 Off-the-Shelf hnCD16 NK Cell Product Candidate

First Clinical Observations in Regimen A for Patients with AML

Patient 1

- Refractory to multiple lines of therapy
- Early disease assessment following the first three doses of FT516 with IL-2 cytokine support showed:
  - No morphologic evidence of leukemia in the bone marrow
  - Recovery of neutrophils (>1,000 per µL)
- Protocol-defined response assessment following completion of the second 30-day cycle of FT516 showed stable disease
  - Patient successfully bridged to haploidentical HSCT

Patient 2

- Received three prior lines of therapy and was most recently refractory to experimental therapy
- Protocol-defined response assessment following completion of the second 30-day cycle of FT516 showed stable disease

No DLTs, no FT516-related SAEs, and no events of cytokine release syndrome, neurotoxicity, or graft-versus-host disease were reported by investigators in either patient
## Universal, Off-the-Shelf NK Cell Cancer Immunotherapy Pipeline

<table>
<thead>
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FT596 Off-the-Shelf Multi-Targeted CAR NK Cell Product Candidate
Potential Best-in-Class Cell-based Cancer Immunotherapy for B-cell Malignancies

First-ever Cell Therapy Engineered with Three Active Anti-tumor Modalities Cleared for U.S. Clinical Investigation

**High-affinity, Non-Cleavable CD16**

- **hnCD16**: High-affinity 158V, non-cleavable CD16 Fc receptor that has been modified to augment antibody-dependent cellular cytotoxicity by preventing CD16 down-regulation and enhancing CD16 binding to tumor-targeting antibodies

- **CAR19**: Chimeric antigen receptor optimized for NK cell biology, which contains a NKG2D transmembrane domain, a 2B4 co-stimulatory domain and a CD3-zeta signaling domain, that targets B-cell antigen CD19

- **IL-15RF**: Interleukin-15 receptor fusion, a potent cytokine complex that promotes survival, proliferation and trans-activation of NK cells and CD8 T cells
FT596 Supported by Clinical POC with Donor-derived CAR19 NK Cells
M.D. Anderson Cancer Center, Katy Rezvani, M.D., Ph.D. (NCT03056339)

**The NEW ENGLAND JOURNAL of MEDICINE**

Use of CAR-Transduced Natural Killer Cells in CD19-Positive Lymphoid Tumors

- First-in-human clinical trial testing the safety and efficacy of cord blood-derived CAR NK cells
  - Transduced with CAR19 (28z) / IL15 (secreted) / iCas9 (suicide)
- Treated 11 patients with r/r B-cell malignancies
  - 3 dose levels (0.1M, 1.0M, 10M cells / kg)
- CR in 8/11 patients
  - CRs observed at all dose levels
  - CRs observed across all disease sub-types
- No CRS / neurotoxicity

NEJM 2020;382:545-53.

*** FATE is not affiliated with product candidate or clinical study ***
FT596 Uniformly-engineered, Well-characterized Product Profile
Derived from Clonal Master Engineered iPSC Line

Clonal Master iPSC Line
derived from a single iPSC engineered with three functional elements

1x10^6 iPSCs

1x10^{12} iNKs

High-affinity, Non-Cleavable CD16

CD20-targeted mAbs

FT596 Product Profile

IL15 Receptor Fusion

FT596

CD56

CD16

0.40

97.1

0.078

3.01

1.70

0.85

93.3

3.01

CD45

CD56

IL15RF

CAR

2.72

94.4

1.02

1.85

2.91
FT596 Monotherapy Anti-tumor Activity \textit{In Vivo}

\textbf{Durable Anti-Leukemia and Anti-Lymphoma Activity in Various Xenograft Mouse Models}

**Monotherapy**

\textbf{Leukemia xenograft NSG immunodeficient mouse model}

- NALM6 (i.v.)
- FT596 (i.v.)
- \textbf{control} Tumor Only (NALM6) Tumor + FT596

\begin{tabular}{c c c c c c}
  D2 & D7 & D11 & D15 & D21 & \\
  ![Images for day 2, 7, 11, 15, 21] & ![Images for day 2, 7, 11, 15, 21] & ![Images for day 2, 7, 11, 15, 21] & ![Images for day 2, 7, 11, 15, 21] & ![Images for day 2, 7, 11, 15, 21] & \\
\end{tabular}

\textbf{Tumor Burden and Control}

\begin{tabular}{c c c}
  Total Flux [photons/sec] & 10^{-11} & 10^{-10} & 10^{-9} & 10^{-8} & 10^{-7} & 10^{-6} & 10^{-5} & 10^{-4} & 10^{-3} & 10^{-2} & 10^{-1} \\
  Days Post Tumor Transplant & 1 & 7 & 11 & 15 & 21 & 28 & 37 & 43 & 61 & & & \\
  NALM6 & & & & & & & & & & & & \\
  FT596 & & & & & & & & & & & & \\
\end{tabular}

\textbf{Survival Curve}

\begin{tabular}{c c}
  Percent survival & 100 & 50 & 0 \\
  Day post primary tumor & 0 & 20 & 40 & 60 & 80 & & & & & & \\
  NALM6 & & & & & & & & & & & & \\
  FT596 & & & & & & & & & & & & \\
\end{tabular}
FT596 Combination Anti-tumor Activity *In Vivo*

*Durable Anti-Leukemia and Anti-Lymphoma Activity in Various Xenograft Mouse Models*

**Combination**

*Lymphoma xenograft NSG immunodeficient mouse model*

![Graph showing Tumor Burden and Control](image-url)

**FT596** (i.v.)

Raji (i.v.)

Rituximab

**D0**

Control

Raji

Raji + Rituximab

FT596 + Raji + Rituximab

**D2**

**D7**

**D15**

**D22**

**Tumor Burden and Control**

- Red: Tumor (Raji)
- Blue: Rituximab
- Purple: FT596 + Rituximab

*Graph key*
FT596 Universal, Off-the-Shelf Multi-antigen Targeted CAR NK Cell

Phase 1 Study Design in Relapsed / Refractory B-cell Lymphoma and CLL

Phase 1 Dose Escalation – Monotherapy and mAb Combination

Combination with mAb in CLL

Combination with mAb in B-cell Lymphoma

Monotherapy in B-cell Lymphoma

### Dose Escalation (3x3)

- Multi-antigen targeting
- Single-antigen targeting

### Dose Expansion
FT596 Universal, Off-the-Shelf Multi-antigen Targeted CAR NK Cell
First Clinical Observations in Regimen A Monotherapy

**Patient 1 (single dose of 30M FT596 cells as a monotherapy)**
- Treated with 4+ lines of therapy for relapsed / refractory diffuse large B-cell lymphoma (DLBCL)
- Most recently had disease progression following CD19-targeting CAR T-cell therapy (axicabtagene ciloleucel)
- Day 29 protocol-defined response assessment showed progressive disease (PD)

**Patient 2 (single dose of 30M FT596 cells as a monotherapy)**
- Treated with 4+ lines of therapy for relapsed / refractory diffuse large B-cell lymphoma (DLBCL)
- Most recently refractory to experimental combo therapy comprised of expanded allogeneic NK cells, IL-2, and rituximab
- Day 29 protocol-defined response assessment showed partial response (PR)
  - >70% reduction in standardized uptake value (SUV) and >50% reduction in tumor size by PET-CT
  - Peak FT596 cell expansion detected at Day 8 (~1800 transgene copies / µg DNA)
  - Seeking consent from FDA to re-treat with single-dose of 30M FT596 cells

*No DLTs, no FT596-related SAEs, and no events of cytokine release syndrome, neurotoxicity, or graft-versus-host disease were reported by investigators in either patient*
Off-the-Shelf, iPSC-derived NK Cell Cancer Immunotherapy Franchise
Systematic Build of Industry-Leading iPSC-derived NK Cell Product Pipeline

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Universal, Off-the-Shelf NK Cell Cancer Immunotherapy Pipeline
FT538 Off-the-Shelf hnCD16 CD38-KO NK Cell Product Candidate
Combination with anti-CD38 mAb for Multiple Myeloma

Overcome Endogenous NK Cell Deficiencies for Optimized ant-CD38 Activity in Myeloma

- **hnCD16**: High-affinity 158V, non-cleavable CD16 Fc receptor that has been modified to augment antibody-dependent cellular cytotoxicity by preventing CD16 down-regulation and enhancing CD16 binding to tumor-targeting antibodies.

- **CD38-KO**: Deletion of CD38 to eliminate anti-CD38 antibody mediated NK cell fratricide; shown to improve NK cell fitness and potency through optimization of metabolic signaling.

- **IL-15RF**: Interleukin-15 receptor fusion, a potent cytokine complex that promotes survival, proliferation and trans-activation of NK cells and CD8 T cells.

*IND Allowed by FDA for AML Monotherapy and for MM Combination with daratumumab*
FT538 Off-the-Shelf hnCD16 CD38-KO NK Cell Product Candidate
Enhanced Cytotoxicity vs. PB NK Cells in a Serial Stimulation Cytotoxicity Assay

Overcome Endogenous NK Cell Deficiencies for Optimized ant-CD38 Activity in Myeloma

Transfer effector cells from MM.1R – Round 1 to MM.1R – Round 2
FT538 Off-the-Shelf hnCD16 CD38-KO NK Cell Product Candidate
Enhanced ADCC in Combination with anti-CD38 mAb In Vivo
### Universal, Off-the-Shelf NK Cell Cancer Immunotherapy Pipeline

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Validated CAR BCMA in diffuse large B cell lymphoma, follicular lymphoma, mantle cell lymphoma, and chronic lymphocytic leukemia

BCMA CAR T cells triggered target cell lysis with an activation threshold in the range of 100 BCMA molecules, which allowed for an efficient eradication of B-NHL cells in vitro and in vivo

Potential novel therapeutic option for patients where BCMA is expressed at low abundance or where anti-CD19 immunotherapies have failed due to antigen loss
FT576 Off-the-Shelf Multi-Targeted CAR-BCMA NK Cell Product Candidate
Potential Best-in-Class Cell-based Cancer Immunotherapy for Multiple Myeloma

CAR NK Cell Product Engineered with Four Anti-tumor Modalities

- **hnCD16**: High-affinity 158V, non-cleavable CD16 Fc receptor that has been modified to augment antibody-dependent cellular cytotoxicity by preventing CD16 down-regulation and enhancing CD16 binding to tumor-targeting antibodies
  
  ---------------------------------------------------------------

- **CAR-BCMA**: Chimeric antigen receptor optimized for NK cell biology, which contains a NKG2D transmembrane domain, a 2B4 co-stimulatory domain and a CD3-zeta signaling domain, that targets B-cell maturation antigen
  
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- **IL-15RF**: Interleukin-15 receptor fusion, a potent cytokine complex that promotes survival, proliferation and trans-activation of NK cells and CD8 T cells
  
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- **CD38-KO**: Deletion of CD38 to eliminate anti-CD38 antibody mediated NK cell fratricide; shown to improve NK cell fitness and potency through optimization of metabolic signaling

*Planned IND Submission for 4Q20*
iPSC-derived CAR T-Cell Franchise
“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.”
First-of-Kind Off-the-Shelf CAR T-cell Therapy Derived from Renewable Master iPSC Line Engineered to Uniformly Express Novel 1XX CAR19 and Knock-out TCR

1XX CAR19: Novel chimeric antigen receptor consisting of CD28 costimulatory domain and modified CD3z signaling domain for optimal effector cell persistence and anti-tumor potency

TRAC-targeted CAR: Chimeric antigen receptor integrated into the T Cell Receptor Alpha Constant region to be regulated by endogenous control of TCR expression for optimal CAR performance

TCR-KO: Bi-allelic disruption of TRAC at the clonal level for complete removal of TCR expression and the elimination for the possibility of GvHD in allogeneic setting

IND Application Recently Submitted to FDA
FT819 Off-the-Shelf CAR19 T-Cell Product Candidate

Phenotype, Proliferation and Potency

- iPSC Thaw & Maintenance
- iCD34 Differentiation
- iT Differentiation
- iT Expansion

Expansion

Potency & Specificity

- In vitro antigen specific killing – Nalm6
  - wt Nalm6
  - 19KO Nalm6

Cell number

Day of iT differentiation

% specific cytotoxicity

E:T 31.6 10 3.16 1 0.316 0.1 0.0316
FT819 Enhanced Tumor Control vs. Primary CAR T Cells
Disseminated Xenograft Model of Lymphoblastic Leukemia
FT819 Persistence in Bone Marrow vs. Primary CAR T Cells

Disseminated Xenograft Model of Lymphoblastic Leukemia
Partnerships
Janssen Cancer Immunotherapy Collaboration

Off-the-shelf, iPSC-derived CAR NK Cell and CAR T-Cell Collaboration

- FATE to incorporate Janssen proprietary antigen binding domains into iPSC-derived CAR NK- and CAR T-cells
  - Up to 4 antigen targets, including targets expressed on hematologic malignancies and solid tumors
- FATE to preclinically develop product candidates to IND submission
  - Janssen to pay for all collaboration costs
- Janssen to conduct global clinical development and commercialization
  - FATE retains a right to opt-in to 50-50 commercialization arrangement in U.S.
  - FATE primarily responsible for clinical and commercial manufacture
- FATE eligible to receive up to $3.0BN in milestones ($1.8BN in dev / reg; $1.2BN in commercial) plus double-digit royalties on commercial sales
<table>
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<th><strong>Tumor Type</strong></th>
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<th><strong>Product 2</strong></th>
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<th><strong>ONO to contribute novel TAA binder</strong></th>
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<th><strong>Preclinical Funding</strong></th>
<th><strong>Up to $70M, including $10M upfront plus $20M in committed research funding and up to an additional $40M in contingent fees</strong></th>
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<th><strong>FATE Rights</strong></th>
<th><strong>Worldwide excluding Asia</strong></th>
<th><strong>Opt-in to 50-50 clinical development and commercialization in the U.S. and Europe</strong></th>
</tr>
</thead>
</table>

| **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*
Next-Generation CRISPR Editing Technologies
MAD7 CRISPR Nuclease

- Patent-protected, RNA-guided, Class 2 Type V CRISPR nuclease isolated from *Eubacterium rectale*
- Improved features over commonly-used CRISPR-Cas9 nucleases:
  - More versatile PAM recognition domain
  - Smaller size of nuclease facilitates transfection efficiency
  - Differentiated cleavage kinetics with potential for fewer off-target edits
- MAD7 validated in FATE iPSC Product Platform
  - Efficient cleavage efficiency demonstrated in CD38, TRAC and safe harbor loci

**FATE secured license to make and use MAD7 for research, development and commercialization of iPSC-derived cell products**