

An elderly couple is walking together on a grassy hillside. The woman, on the left, is wearing a beige jacket, a bright yellow scarf, and has binoculars hanging from her neck. The man, on the right, is wearing a brown jacket, a grey scarf, and blue jeans. They are both looking towards the right, smiling. The background is a vast, hazy landscape of rolling hills covered in dense forests with autumn-colored foliage. The sky is overcast and misty.

THE POWER OF tomorrow

Engaging the TCR to Transform
the Treatment of Solid Tumors

Corporate Presentation

May 2022

TCR²
THERAPEUTICS

Forward Looking Statements

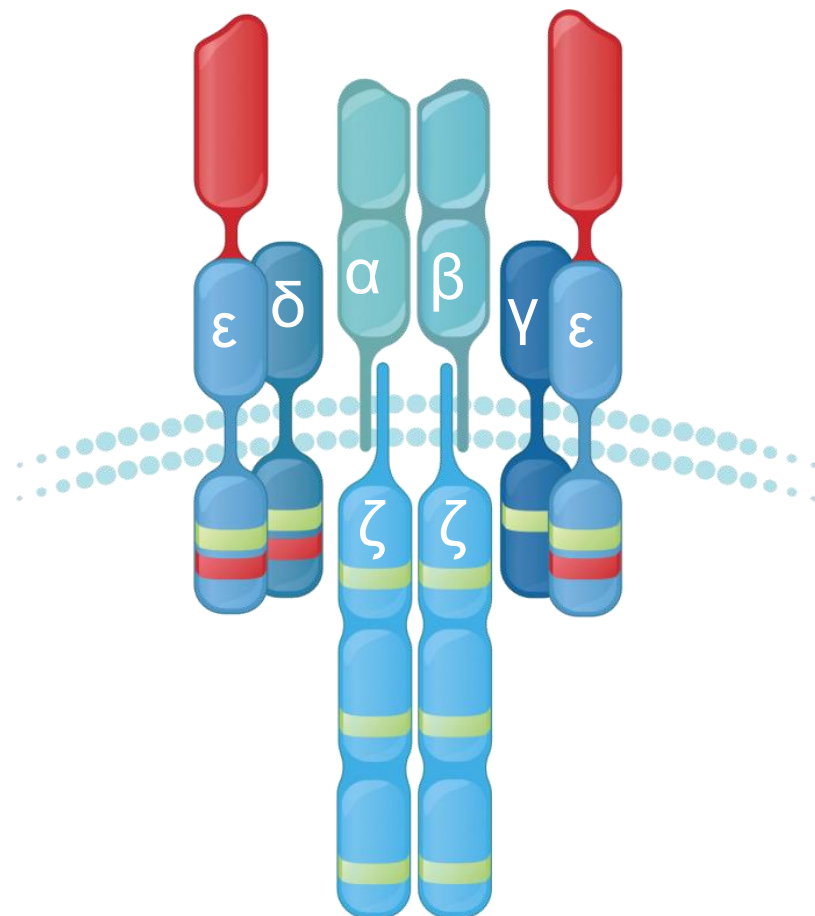
This presentation has been prepared by TCR² Therapeutics Inc. (“we,” “us,” or “our”) and contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995 and other federal securities laws. Forward-looking statements are neither historical facts nor assurances of future performance. Instead, they are based on our current beliefs, expectations and assumptions regarding the future of our business, future plans and strategies, our development plans, our clinical results and other future conditions. All statements, other than statements of historical facts, contained in this presentation, including express or implied statements regarding our expectations for the Phase 2 clinical trial of gavo-cel and the Phase 1/2 clinical trial of TC-510, including expected progress and timing of updates; our expectations for the safety and efficacy of, and enhancements to, gavo-cel, TC-510 and our other product candidates including compared to other T-cell therapy approaches; our expectations regarding the estimated patient populations and related market opportunities in gavo-cel’s, TC-510’s and our other product candidates’ targeted indications; our expectations regarding manufacturing of gavo-cel, TC-510 and our other product candidates; our expectations regarding our development programs and IND-enabling studies; our expectations regarding expansion opportunities for our TRuC platform; and our expectations regarding our financial position are forward-looking statements. These statements are based on management’s current expectations and beliefs and are forward-looking statements which involve risks and uncertainties that could cause actual results to differ materially from those discussed in such forward-looking statements.

Such risks and uncertainties include, among others: uncertainties inherent in clinical studies and in the availability and timing of data from ongoing clinical studies; whether interim results from a clinical trial will be predictive of the final results of a trial; the possibility that positive results from preclinical studies and correlative studies may not necessarily be predictive of the results of our planned clinical trials, including the Phase 2 clinical trial of gavo-cel and Phase 1/2 clinical trial of TC-510; the risk that the results from

the Phase 2 clinical trial of gavo-cel and Phase 1/2 clinical trial of TC-510 will not support further development and marketing approval; the risk that we may be unable to gain approval of gavo-cel, TC-510 and our other product candidates on a timely basis, if at all; the risk that we have over-estimated the potential patient population for our product candidates, if approved; the risk that the current COVID-19 pandemic will impact our clinical trials and other operations; and the other risks set forth under the caption “Risk Factors” in our most recent Annual Report on Form 10-K for the year ended December 31, 2021, as filed with the SEC on March 22, 2022, as updated in our most recent Quarterly Report on Form 10-Q for the quarter ended March 31, 2022, as filed with the SEC on May 15, 2022, and in our future filings with the SEC available at the SEC’s website at www.sec.gov. New risks and uncertainties may emerge from time to time, and it is not possible to predict all risks and uncertainties. You should not place undue reliance on any forward-looking statements, which speak only as of the date they are made.

While we may elect to update these forward-looking statements at some point in the future, we assume no obligation to update or revise any forward-looking statements except to the extent required by applicable law. Although we believe the expectations reflected in such forward-looking statements are reasonable, we can give no assurance that such expectations will prove to be correct. Accordingly, readers are cautioned not to place undue reliance on these forward-looking statements. No representations or warranties (expressed or implied) are made about the accuracy of any such forward-looking statements.

Innovating the Natural Power of the TCR for Solid Tumors



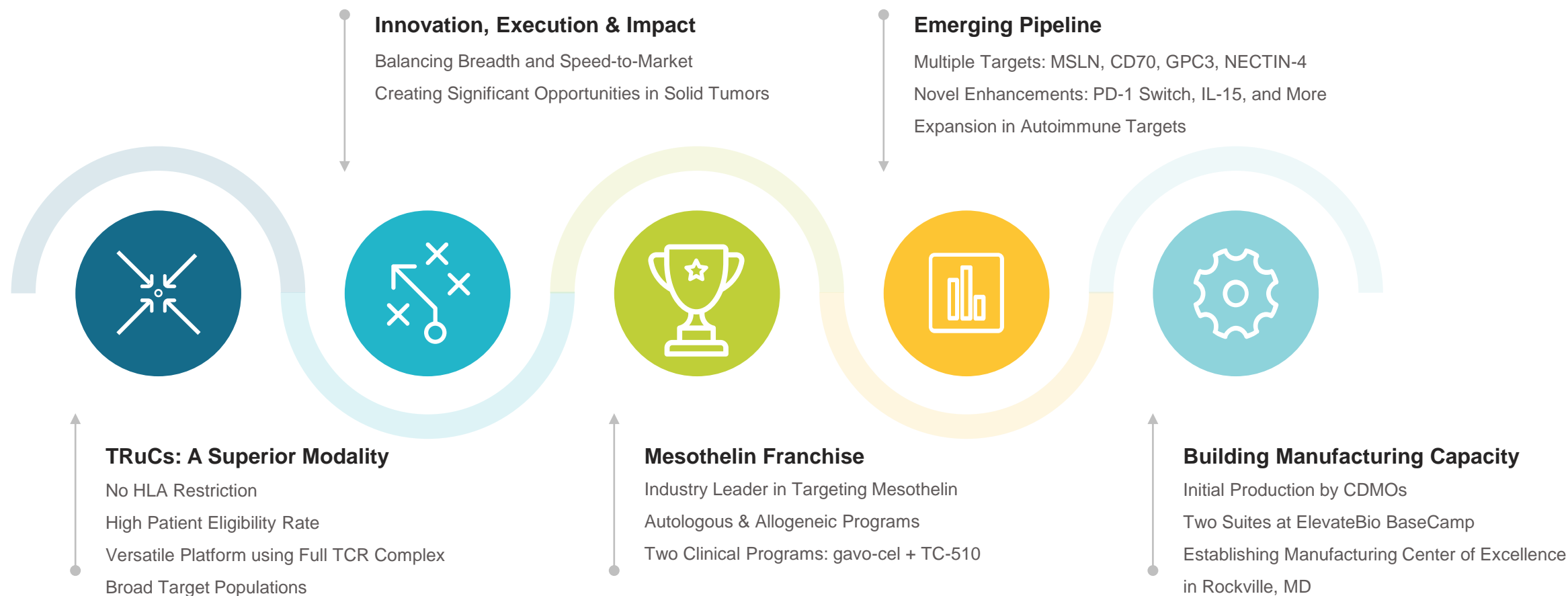
TRuC® Platform
(T Cell Receptor Fusion Construct)

We Are Solving the Translation of Cell Therapies to Solid Tumors with a New Modality: **TRuC-T Cells**

- ✓ Comprehensive T cell activation through **integration with full TCR complex**
- ✓ **No HLA restriction** supports broad patient access
- ✓ **Versatile platform** with flexibility to add enhancements
- ✓ **Multiple high-value indications** across oncology and autoimmune

Where We Are Going

TCR²'s 2022 Trajectory and Beyond



Advancing a Diverse Pipeline of Solid Tumor Programs

| Target | Indication(s) | Program | Enhancement / Combo | Discovery | Lead Optimization | IND Enabling | Phase 1/2 | Phase 2/3 | |
|------------|--|----------|----------------------|-------------|-------------------|--------------|-----------|-----------|--|
| Oncology | | | | | | | | | |
| Autologous | | | | | | | | | |
| MSLN | Ovarian cancer, NSCLC, MPM, Cholangiocarcinoma | gavo-cel | Checkpoint inhibitor | | | | | | |
| MSLN | Ovarian cancer, NSCLC, MPM, Cholangiocarcinoma | gavo-cel | | | | | | | |
| MSLN | Solid tumors | TC-510 | | PD-1 switch | | | | | |
| CD70 | Renal cell carcinoma | TC-520 | | IL-15 | | | | | |
| GPC3 | Solid tumors | | | | | | | | |
| Nectin-4 | Solid tumors | | | | | | | | |
| Allogeneic | | | | | | | | | |
| MSLN | Solid tumors | gavo-cel | IL-15 / PD-1 switch | | | | | | |
| CD70 | Renal cell carcinoma | TC-520 | IL-15 / PD-1 switch | | | | | | |
| Autoimmune | | | | | | | | | |
| Autologous | | | | | | | | | |
| HLA-A*02 | Solid organ transplant / GvHD | | | | | | | | |

MSLN, mesothelin; NSCLC, non-small cell lung cancer; MPM, mesothelioma; GvHD, Graft versus Host Disease

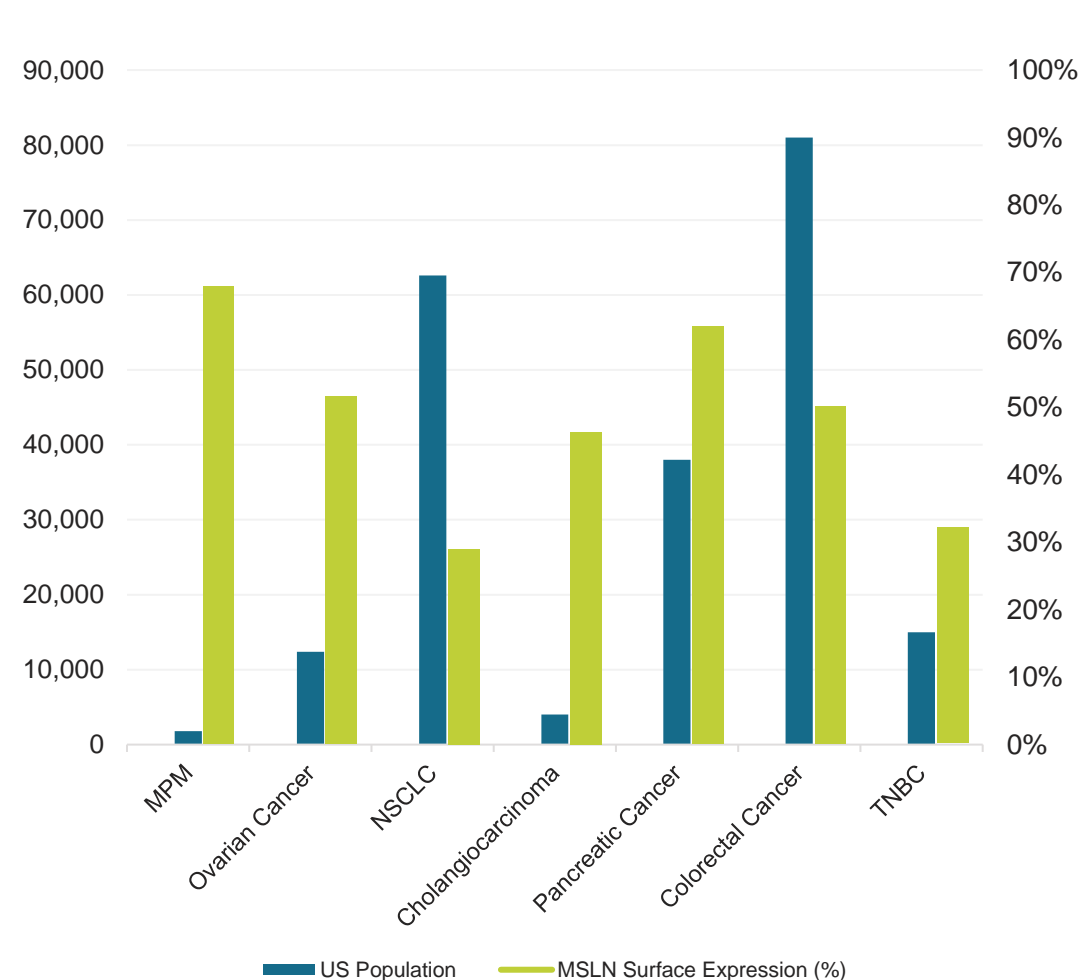


Leading the Way with gavo-cel

Stage of Development: Phase 2

The Significant Mesothelin Solid Tumor Market

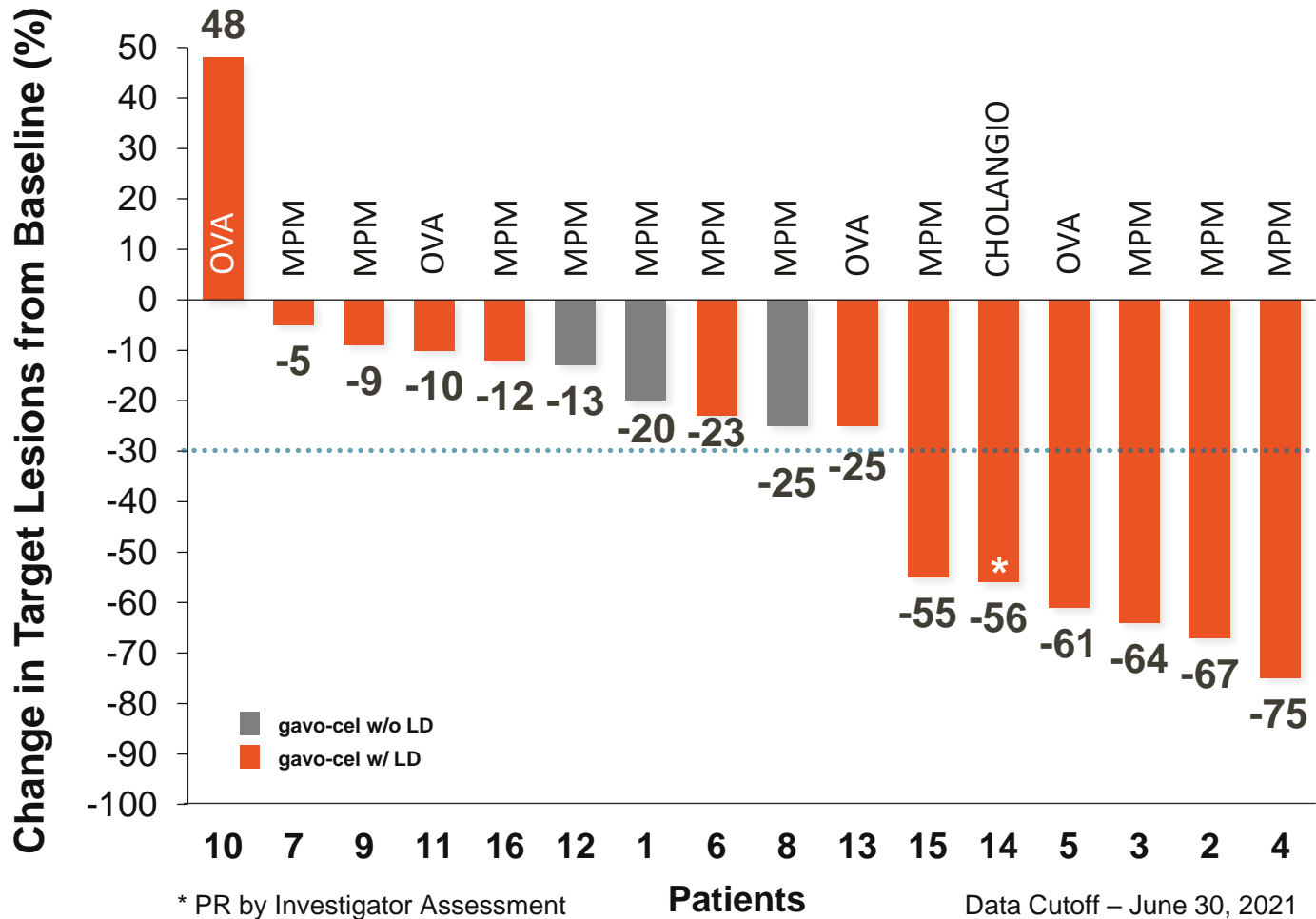
~215,000 Patients Across Multiple Target Indications



| Indication | Population | MSLN Expression | Program(s) | POC |
|--------------------|------------|-----------------|--------------------|---|
| MPM | 1,800 | 76% | gavo-cel TC-510 | Orphan Drug Designation 4 PRs (3 RECIST PRs) 5.9 mPFS (months) 11.2 mOS (months) |
| Ovarian Cancer | 12,400 | 58% | gavo-cel TC-510 | 1 PR (RECIST PR) |
| NSCLC | 62,600 | 31% | gavo-cel | |
| Cholangiocarcinoma | 4,000 | 50% | gavo-cel | Orphan Drug Designation |
| Pancreatic Cancer | 38,000 | 66% | TC-510 | |
| Colorectal Cancer | 81,000 | 55% | TC-510 | |
| TNBC | 15,000 | 26% | TC-510 | |

Consistent Tumor Regression in Patients with gavo-cel

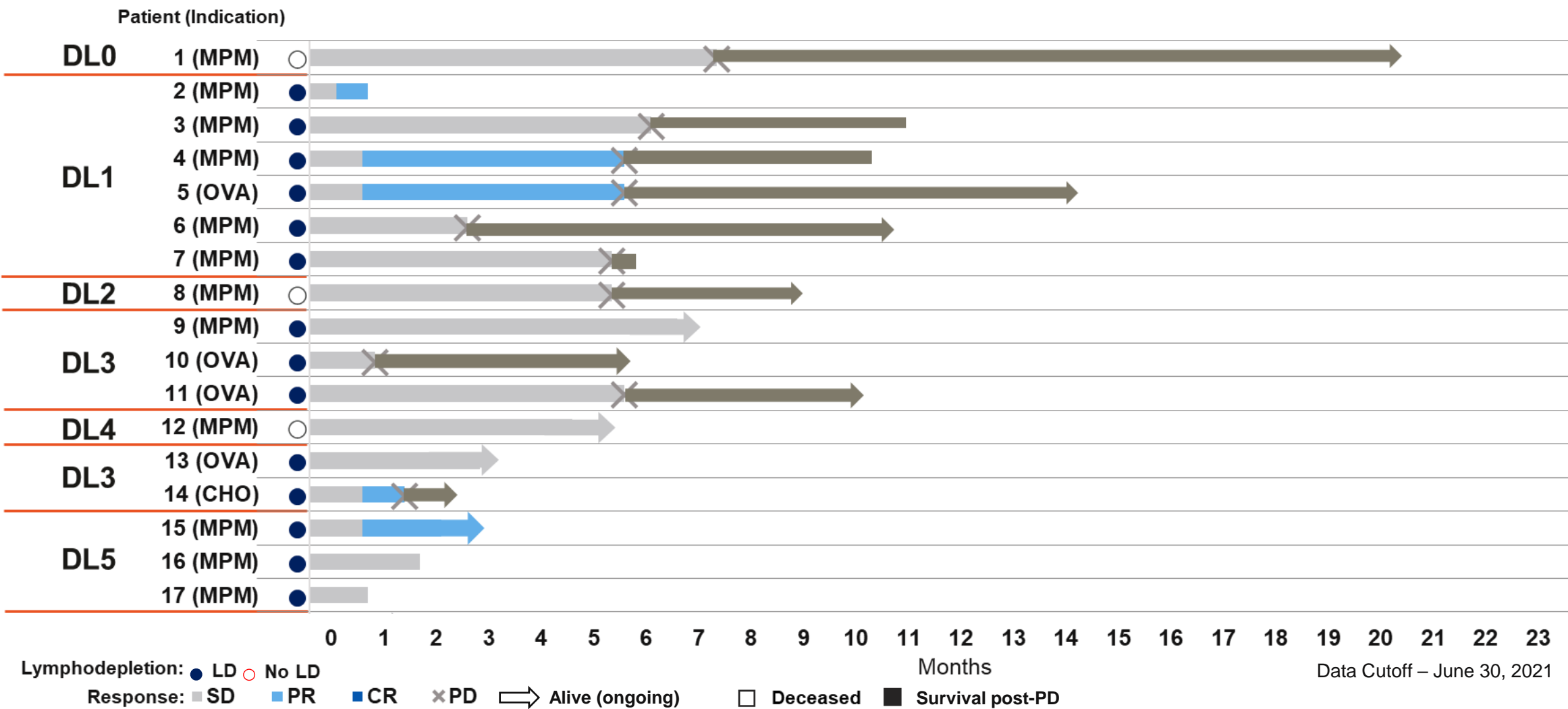
Overall Response Rate 25%, Disease Control Rate 81%



| | All | gavo-cel + LD |
|--------------------|-----|---------------|
| DCR | 81% | 77% |
| ORR (independent) | 25% | 31% |
| ORR (investigator) | 31% | 38% |
| MPM ORR | 27% | 38% |

DCR = PR or SD lasting at least 3 months

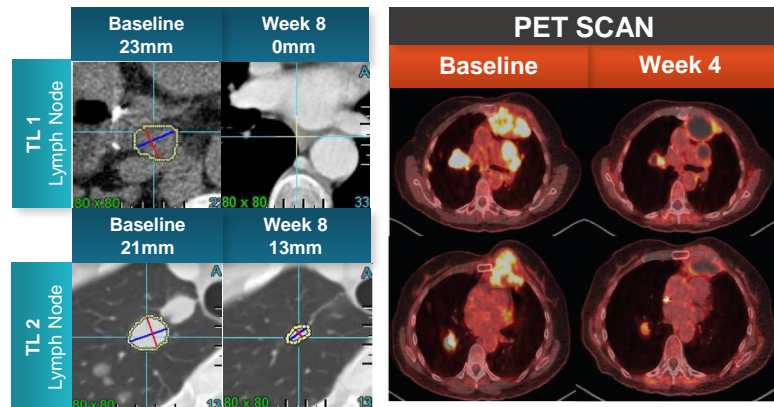
Patient Response and Follow-up as of June 30, 2021



Phase 1 Case Studies

Patient 15 (MPM)

DL5 ($5 \times 10^8/m^2$) + LD



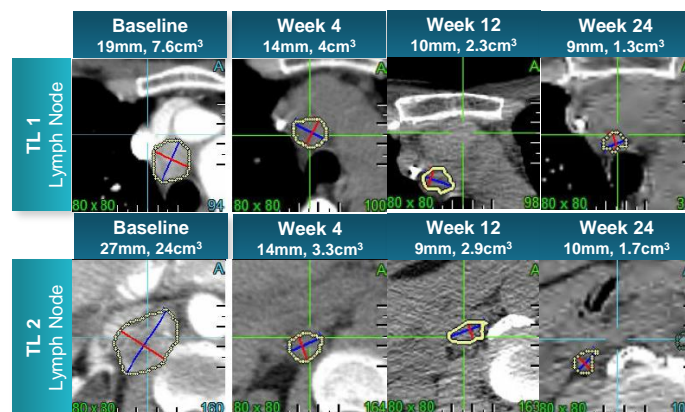
66-year-old female
Relapsed pleural mesothelioma

Failed 4 prior lines of therapy, including nivolumab/ipilimumab and anti-MSLN ADC

- ✓ Partial Response (RECIST v1.1)
- ✓ Tumor Regression (55%)

Patient 5 (Ovarian)

DL1 ($5 \times 10^7/m^2$) + LD



70-year-old female
High grade, Stage IV serous ovarian cancer

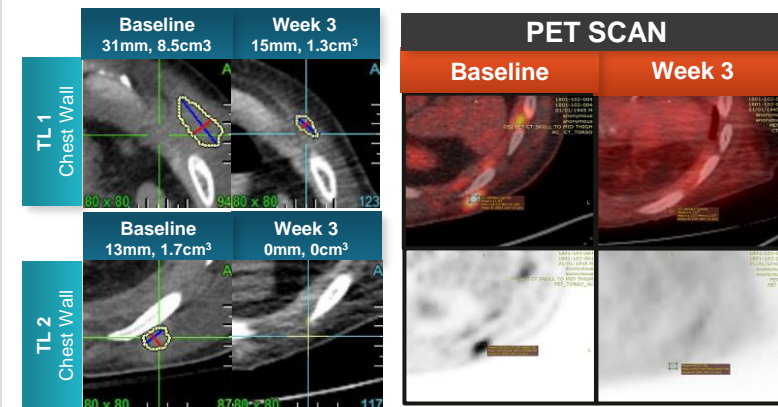
TP53^{R248Q}, CCNE1 amplified, wild type BRCA1/2

Failed 6 prior lines of therapy
Platinum resistant

- ✓ Partial Response (RECIST v1.1)
- ✓ Tumor Regression (61%)

Patient 2 (MPM)

DL1 ($5 \times 10^7/m^2$) + LD



74-year-old male
Epithelioid pleural mesothelioma

Extensive surgery Feb 2018 → PD
Pembrolizumab Sep 2018 → PD
Carboplatin/pemetrexed Apr 2019 (x4) → PD

- ✓ Partial Response (RECIST v1.1)
- ✓ Tumor Regression (67%)
- ✓ Complete Metabolic Response

Mesothelioma Represents a Significant Market for gavo-cel

- MPM is a devastating disease that is highly aggressive and represents a majority of mesothelioma cases
- Existing treatment options are limited
 - Second-line treatments have limited PFS (2-4 months) and OS (9-12 months) benefit
- Bristol Myers Squibb clinical trial collaboration aims to boost gavo-cel activity with PD-1 inhibitors
- Most advanced mesothelin program with minimal pipeline competition
 - gavo-cel clinical data (ORR 38%) in 6th line compares favorably to established 2nd line treatment



Prevalence

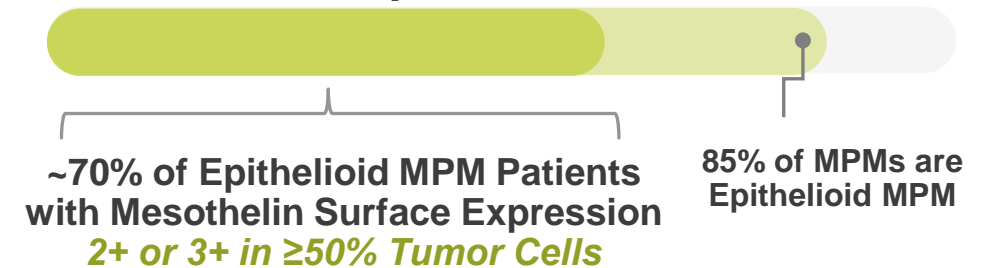
U.S. Population: 1,800

Est. Gavo-cel Opportunity: 1,200

EU Population: 3,000

Est. Gavo-cel Opportunity: 1,900

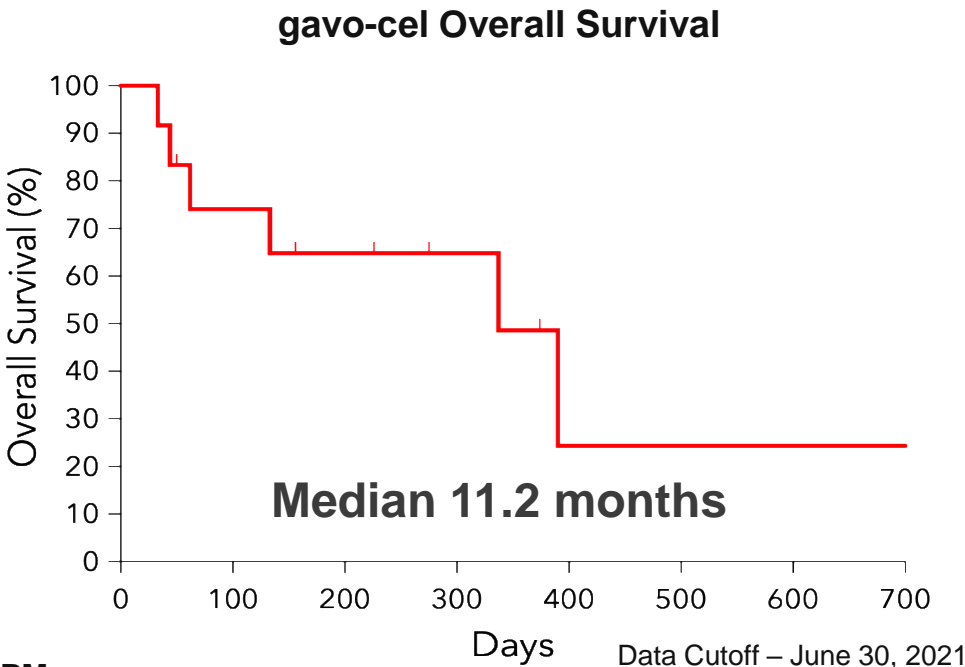
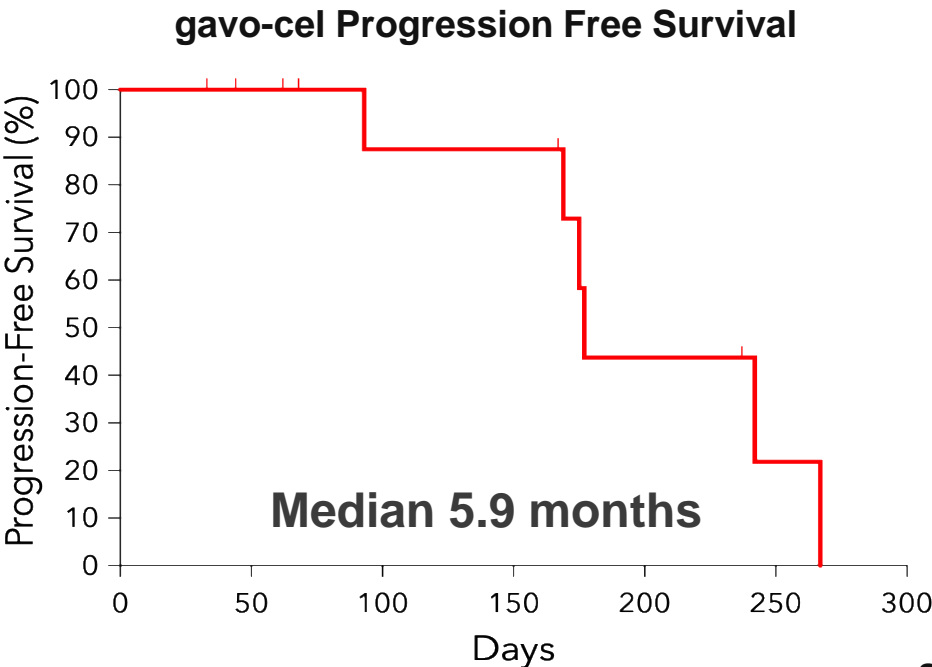
Mesothelin Expression



Refs: gavo-cel Phase 1/2 clinical trial, Inaguma 2017, SEER Statistics, Morello 2016, Tozbikian 2014

Emerging Competitive Profile with gavo-cel in MPM

gavo-cel in MPM Patients: ORR 38%, PFS 5.9 Months, OS 11.2 Months

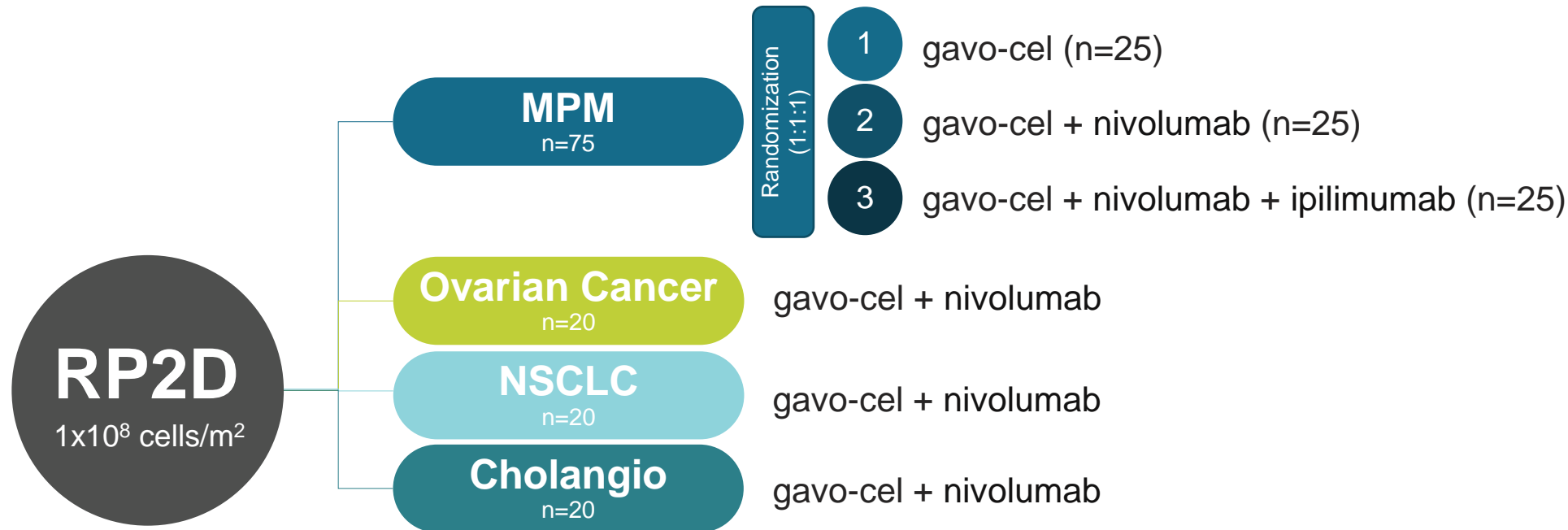


| Second Line MPM (Post Platinum-Based Frontline Therapy) | | | | |
|--|----|---------|----------|---------|
| Monotherapy | n | ORR (%) | PFS (mo) | OS (mo) |
| Vinorelbine vs Supportive Care ¹ | 98 | 3.1 | 4.2 | 9.3 |
| | 56 | 1.8 | 2.8 | 9.1 |
| Pembrolizumab vs Vinorelbine or Gemcitabine ² | 73 | 22 | 2.5 | 10.7 |
| | 71 | 6 | 3.4 | 12.4 |

1. Fennell et al Phase 2 VIM Study. ASCO 2021
2. Popat et al Phase 3 PROMISE-meso Study. Ann Oncol 2020

Phase 2 Expansion Cohorts in MSLN+ Solid Tumors

PATIENT POPULATION: ≤5 PRIOR LINES OF THERAPY



Key Objectives

- Primary: ORR (RECIST v1.1), DCR (ORR+SD)
- Secondary: PFS, OS

Mesothelin Expression

- MPM and Ovarian: ≥50% 2+/3+
- NSCLC and Cholangio: ≥50% 1+/2+/3+

In Collaboration with



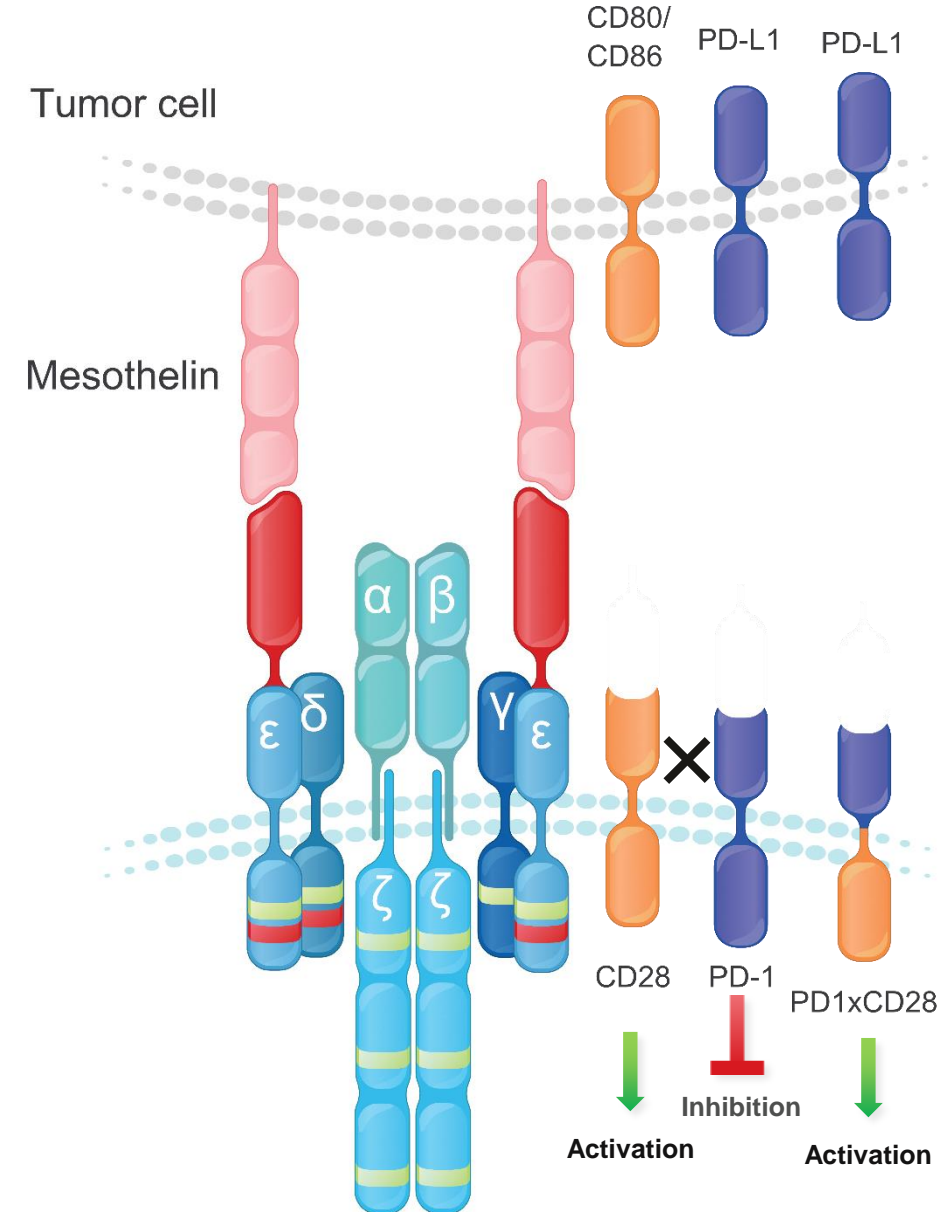


Expanding the Base

Innovating the Next Generation of TRuCs

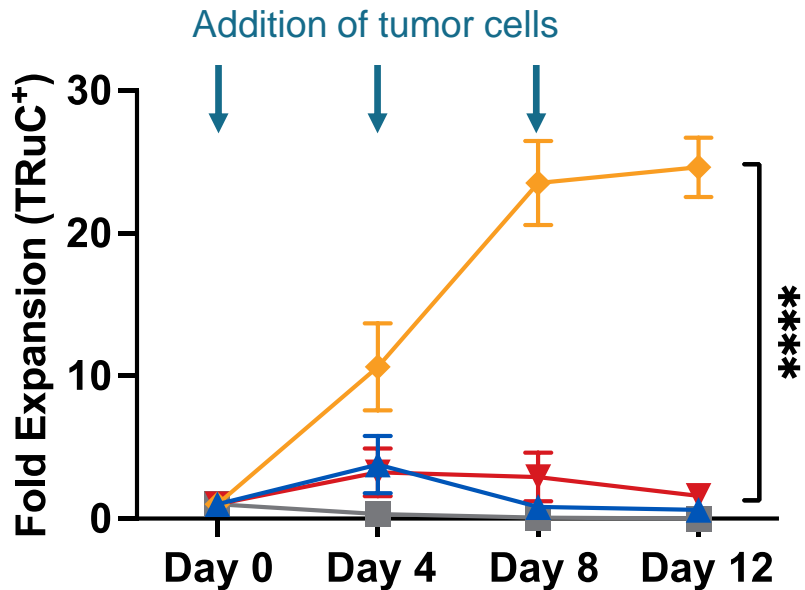
Enhancing gavo-cel with a PD-1:CD28 Switch Receptor

- PD-1:CD28 switch designed to convert PD-L1/L2 inhibitory function into a potent costimulatory signal
- Costimulation occurs only in a PD-L1/2 rich tumor microenvironment upon TRuC and PD-1 ligation resulting in a more targeted signal enhancement
- Mesothelin-targeting TRuCs that co-express a PD-1:CD28 switch in vivo featured:
 - Enhanced early TCR downstream signaling
 - Significantly increased proliferation
 - Prevented exhaustion upon repeated antigen stimulation
 - Enhances efficacy of gavo-cel against PD-L1 overexpressing tumors

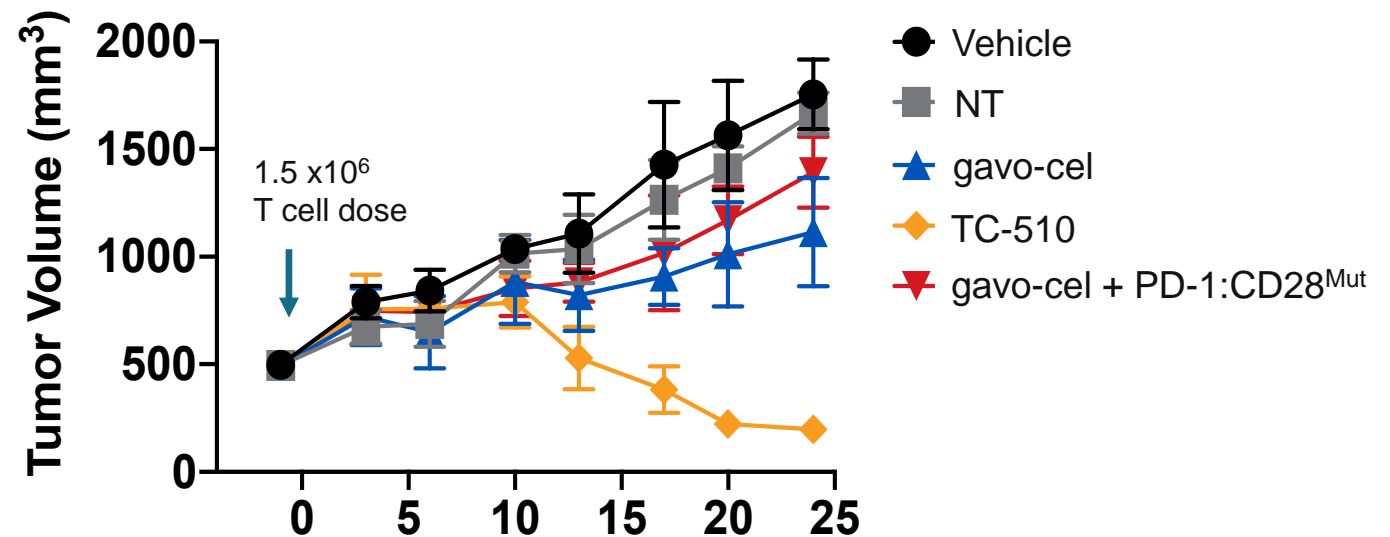


Against Tumors with High PD-L1 Expression, TC-510 Shows Enhanced Proliferation and Superior Efficacy

Expansion upon Repeated Stimulation



Anti-Tumor Activity in Mouse Model

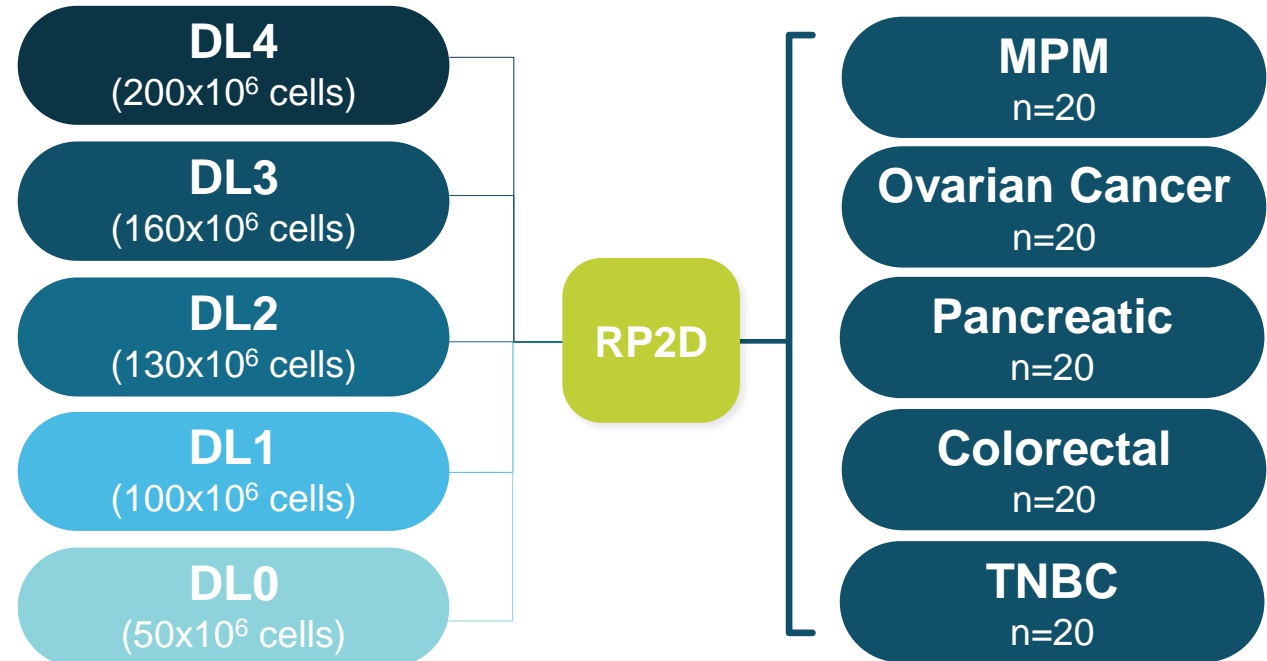
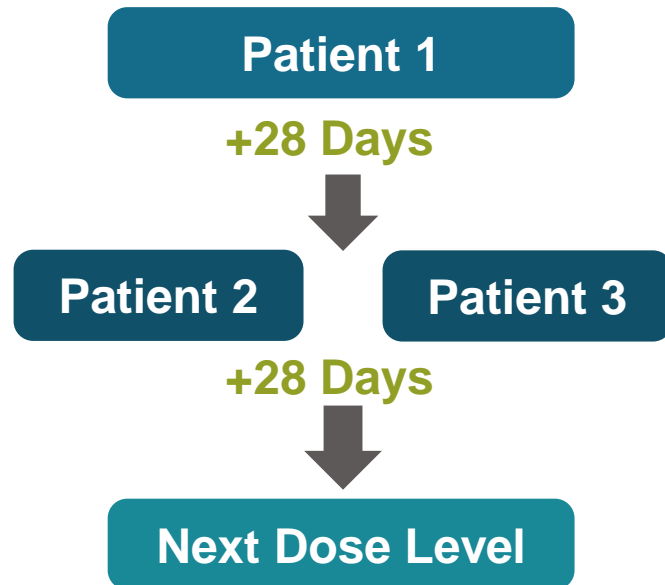


MSTO-M/PDL1 model expressing high MSLN and PD-L1

TC-510 Phase 1 Trial in MSLN+ Solid Tumors

PATIENT POPULATION: ≤ 5 PRIOR LINES OF THERAPY

Each dosing cohort consists of:



Key Objectives

- Primary: Safety, establish RP2D
- Secondary: ORR (RECIST v1.1), DoR, DCR (ORR+SD), PFS, OS

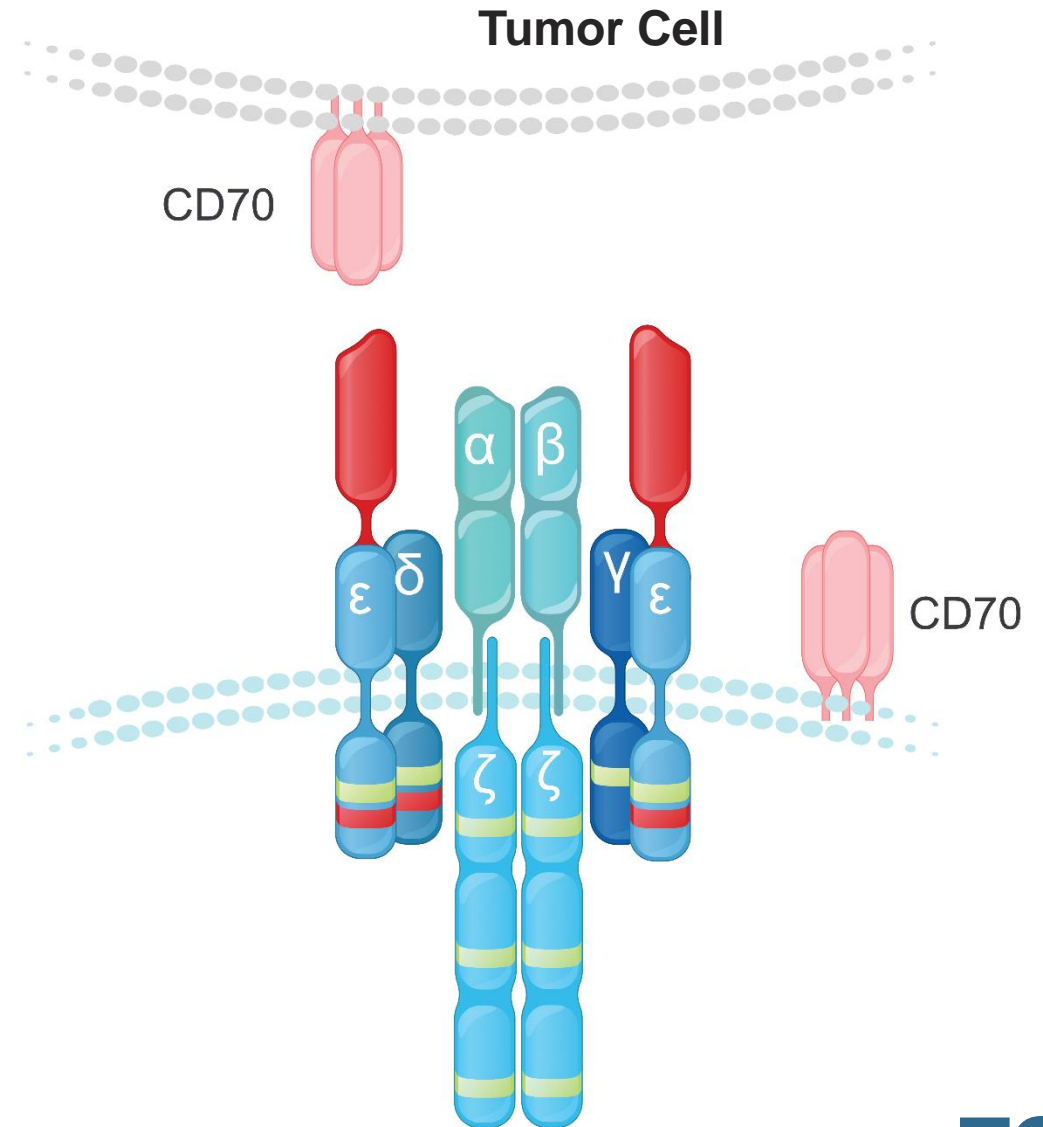
Mesothelin Expression

- $\geq 50\%$ 1+/2+/3+

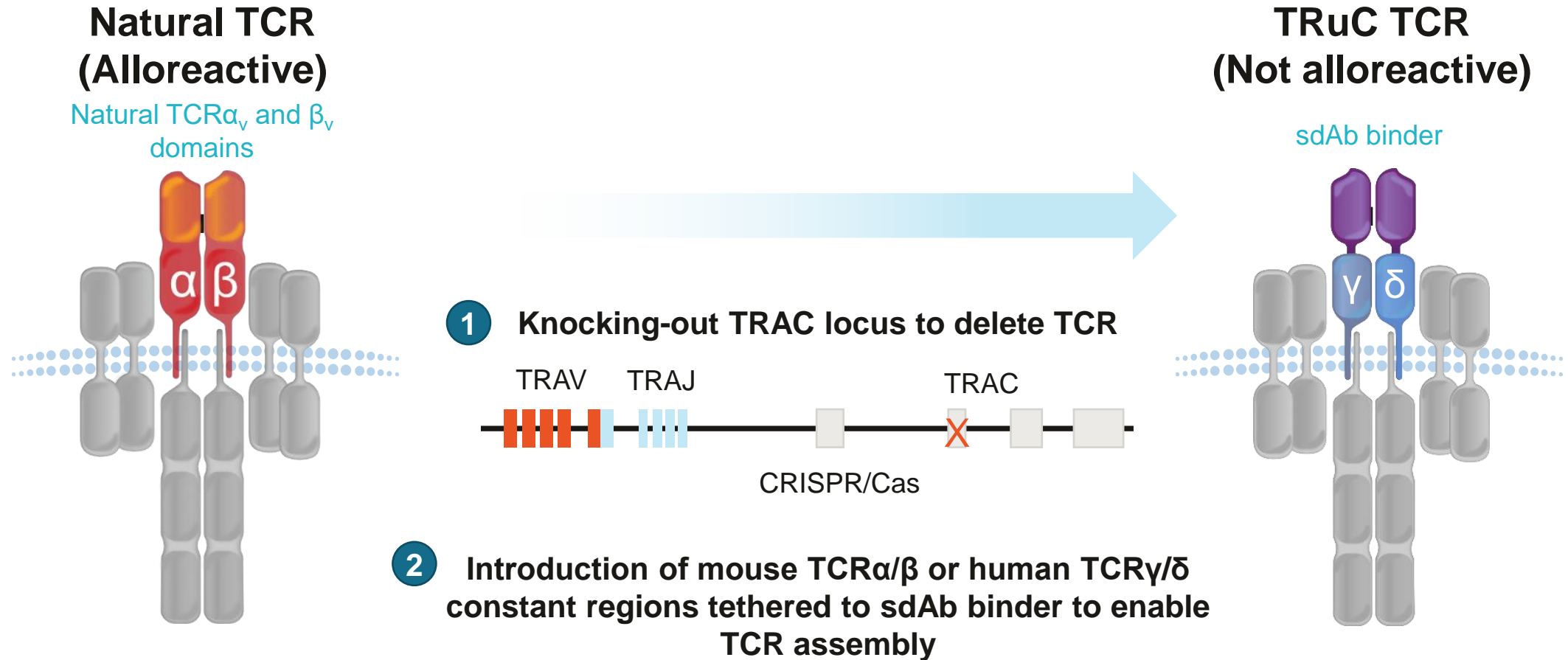
CD70: Highly Attractive Target with an Innate Fratricide Challenge

Up to 141,000 Patients Expressing CD70 in the US

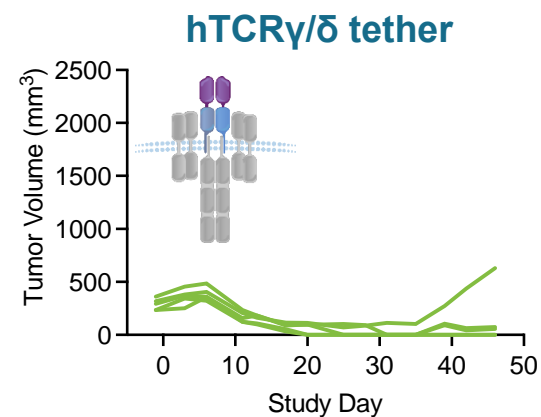
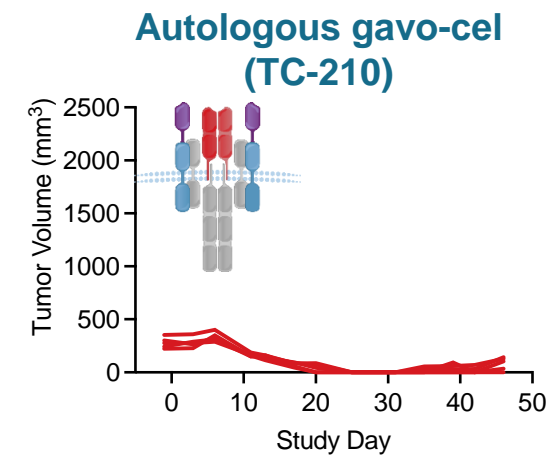
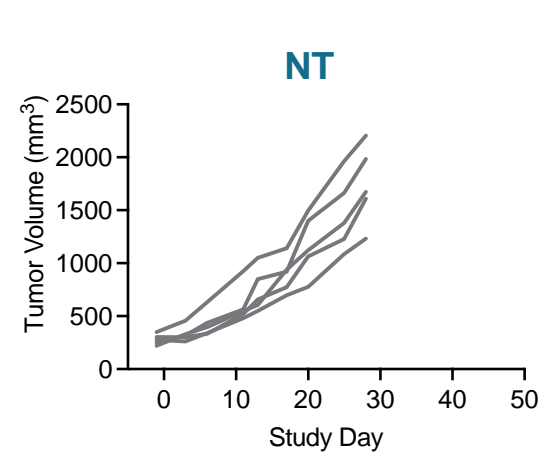
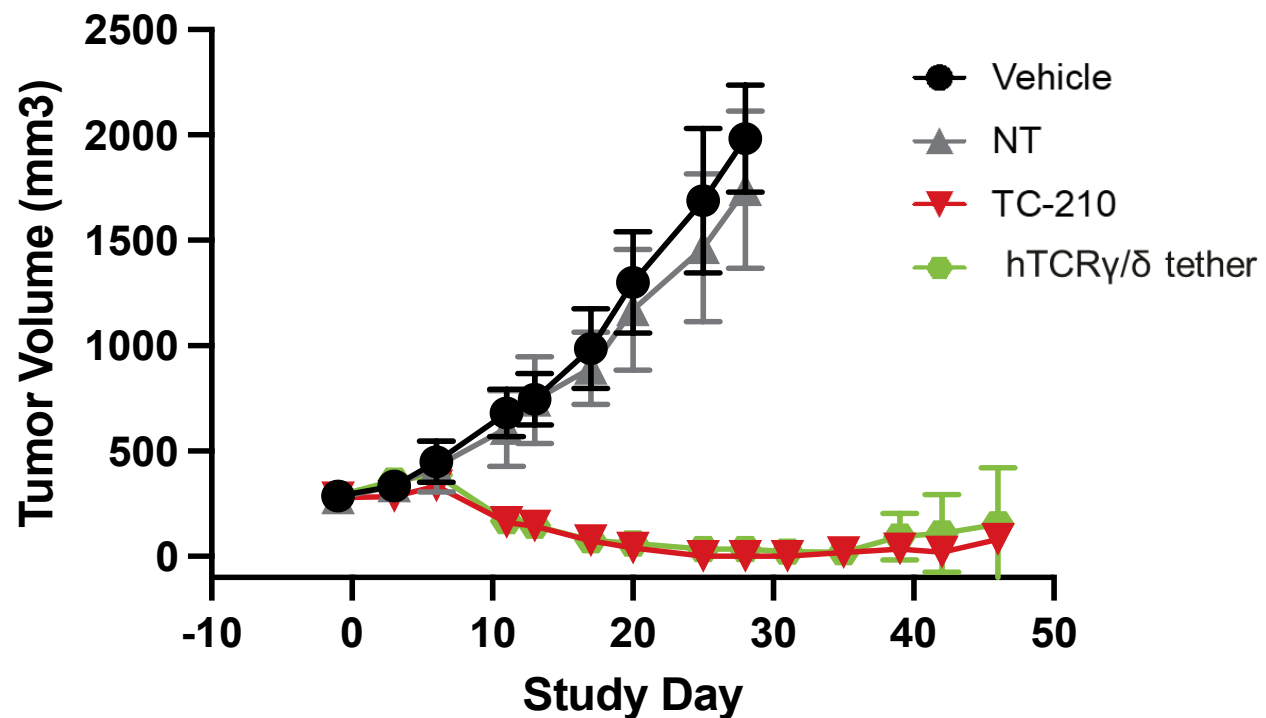
- Versatile tumor target: expressed in hematological malignancies (AML, lymphoma) and solid tumors (RCC, NSCLC, OC)
 - Expression in normal cells limited to a subset of activated T cells, B cells, and dendritic cells
 - Expression in activated T cells renders CD70-directed T cell therapies susceptible to fratricide
- Clinically validated: POC demonstrated in AML with αCD70 mAb in AML (argenx)
- Path to first-in-class autologous CD70 cell therapy
 - Most advanced CAR-T programs by Allogene and CRISPR are allogeneic targeting RCC



Allo TRuC-T Cells Generated in a Two-Step Process



Equivalent Anti-Tumor Activity of gavo-cel with Allogeneic TRuC-T Cells



Upcoming Milestones

Clinical Programs

July 2022 gavo-cel Phase 1 dataset

2H22 Update from gavo-cel Phase 2 trial

2H22 Update from TC-510 Phase 1 trial

Pipeline

2H22 Initiate IND-enabling studies for TC-520

2H22 Lead candidate identification allogeneic program

~\$232M

Cash as of 1Q22

**Runway
into 2024**



THE POWER OF tomorrow

Engaging the TCR to Transform
the Treatment of Solid Tumors

- investors@tcr2.com
- partnering@tcr2.com
- info@tcr2.com

Thank You

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