THE POWER OF *tomorrow*

Engaging the TCR to Transform the Treatment of Solid Tumors

Corporate Presentation

January 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 1/2 clinical trial of gavo-cel, our expectations for the safety and efficacy of our product candidates and enhancements, including gavo-cel, compared to current T-cell therapy approaches, our expectations regarding the estimated patient populations and related market opportunities in gavo-cel's targeted indications, our expectations regarding manufacturing of our product candidates, our expectations regarding our development programs, 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 1/2 clinical trials of gavo-cel; the risk that the results from the Phase 1/2 clinical trials of gavo-cel will not support further development and marketing approval; the risk that we may be unable to gain approval of gavo-cel 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, 2020, as filed with the SEC on March 16, 2021, as updated in our most recent Quarterly Report on Form 10-Q for the quarter ended September 30, 2021, as filed with the SEC on November 10, 2021, 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.

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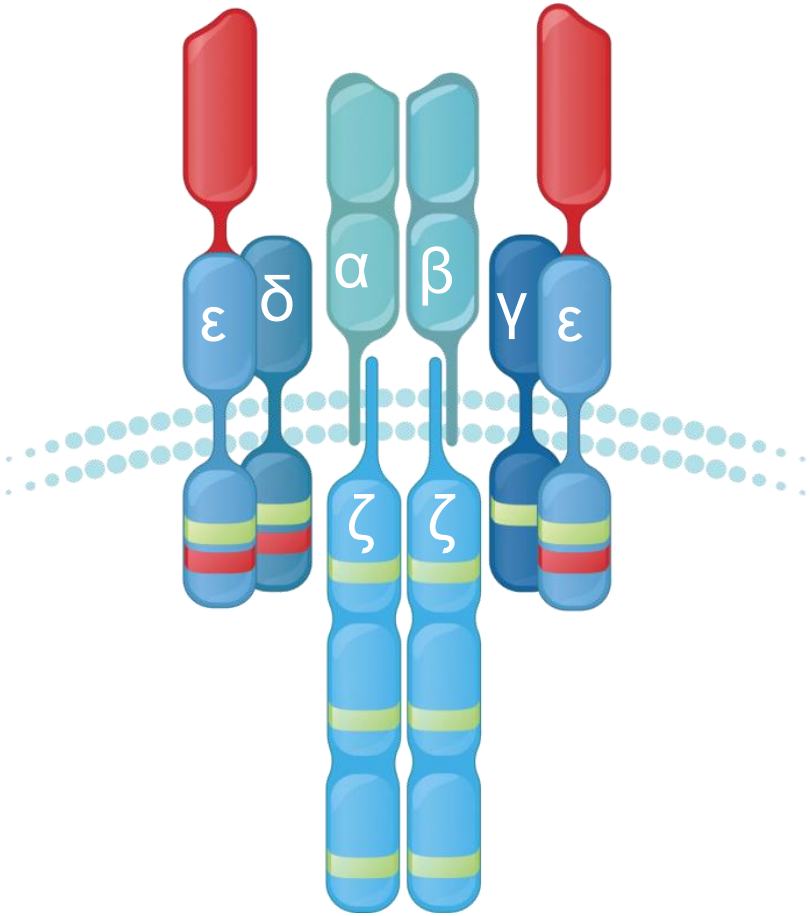
Powering the Full TCR for Solid Tumor Therapies



TRuC® Platform
(**T** Cell **R**eceptor F**u**sion **C**onstruct)

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

TCR, T cell receptor; HLA, human leukocyte antigen

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We Have a Significant Opportunity in the Solid Tumor Market

Targeting Solid Tumors

90%

of all cancers are solid tumors

Using the Full TCR

4

cell therapies have clinical validation in solid tumors – all use the TCR

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IOVANCE BIOTHERAPEUTICS
Adaptimmune
immatics

Lead Program POC

3/3

clinical responses seen in all tumor types treated

Broad Opportunities

~$5.0B

Potential global peak sales* from gavo-cel targeted indications

Mesothelioma
Ovarian cancer
Non-small cell lung cancer
Cholangiocarcinoma

*Consensus based on average analyst estimates covering the company

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2021 Was a Year of Critical Execution

Building the Solid Tumor T Cell Company

GAVO-CEL
Completed Phase 1 dose escalation

GAVO-CEL
Selected a RP2D of $1x10^8$ cells/m^2

GAVO-CEL
Clinical responses in 3 tumor types shown at ESMO

PIPELINE
Published preclinical data on:
CD70
IL-15 enhanced TRuCS
TRuC Tregs
Allogeneic TRuCs

COLLABORATIONS
Bristol Myers Squibb
+
Arbor Biotechnologies

MANUFACTURING
Hired Chief Technical Officer
Established manufacturing center of excellence in Maryland

RP2D, recommended Phase 2 dose; Tregs, regulatory T cells

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Our Value Creation Strategy in 2022

Building the Solid Tumor T Cell Company

Expand gavo-cel Activity

SRT identified RP2D at $1x10^8/m^2$

Phase 2 initiation in 1H22 in MPM and ovarian

Clinical collaboration with BMS to boost signal with PD-1 inhibitors

Accelerate Allogeneic Lead

Integrate advanced nuclease technology through Arbor collaboration

Identification of lead candidate in 2022

Put First TRuC Enhancement in Patients

TC-510 (PD-1 Switch) interim data in 2H22

TC-520 (IL-15) IND-enabling studies in 2022

Partner Key Pipeline Programs

CD70 and GPC3 TRuC-T cells available

Preclinical TRuC-Treg POC presents first non-oncology opportunity

SRT, safety review team; MPM, malignant pleural mesothelioma; BMS, Bristol Myers Squibb; Treg, regulatory T cell

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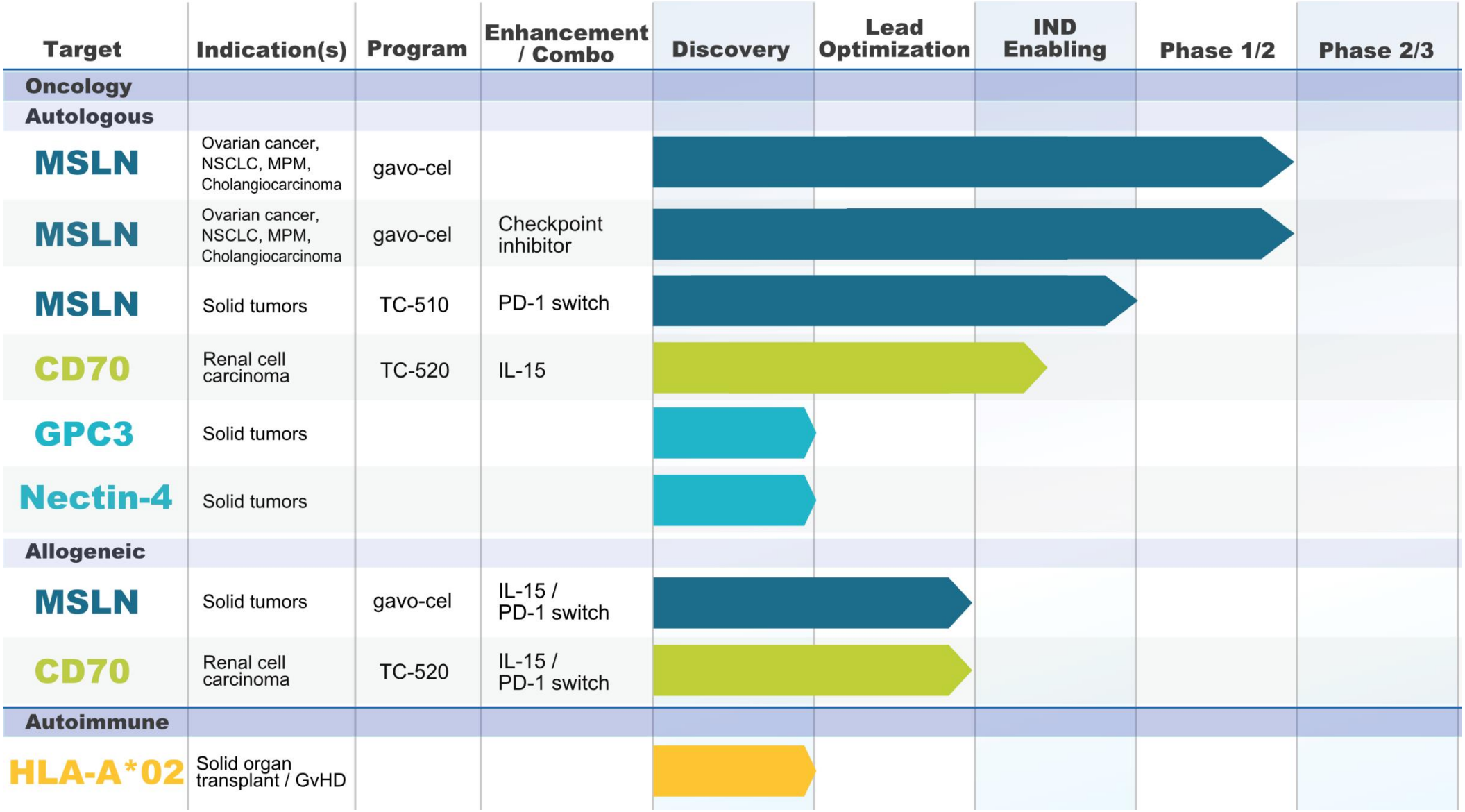
Advancing a Diverse Pipeline of Solid Tumor Programs



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

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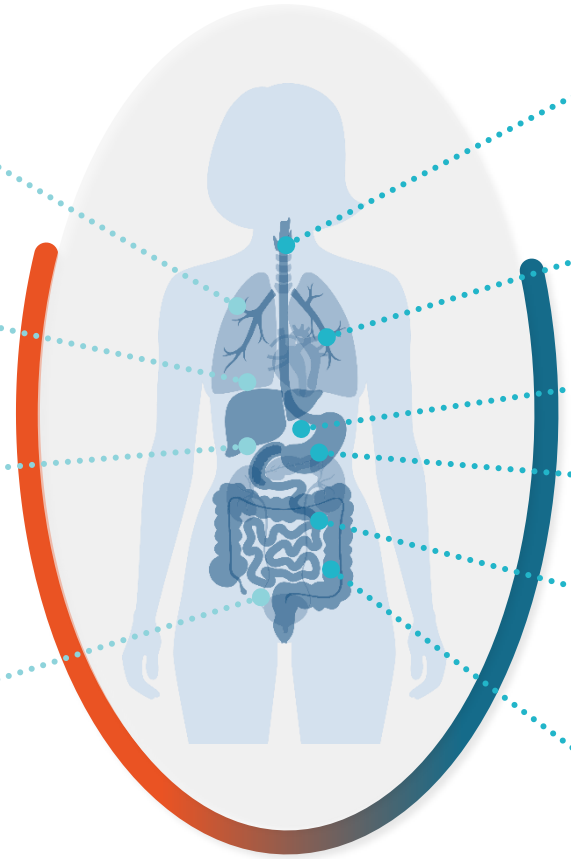
Leading the Way with gavo-cel

Stage of Development: Phase 1/2

Mesothelin Solid Tumors Represent a Significant Market

~240,000 Patients Across Multiple Indications



Malignant Pleural Mesothelioma — 76%
Population: 2,100
✓ **Orphan Drug Designation**
Potential Accelerated Approval

Non-Small Cell Lung Cancer — 31%
Population: 61,000

Cholangiocarcinoma — 50%
Population: 4,000
✓ **Orphan Drug Designation**
Potential Accelerated Approval

Ovarian Cancer — 58%
Population: 13,000

Esophageal Cancer — 30%
Population: 5,000

Triple Negative Breast Cancer — 36%
Population: 15,000

Pancreatic Cancer — 66%
Population: 38,000

Gastric Cancer — 40%
Population: 11,000

Endometrial Cancer — 20%
Population: 13,000

Colorectal Cancer — 55%
Population: 81,000

Percent of Patients with Mesothelin Surface Expression

Refs: Inaguma 2017, SEER Statistics 2020, Morello 2016, Tozbikian 2014

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Gavo-cel by the Numbers

46% **Patients Eligible for gavo-cel Based on Current Mesothelin Threshold**

3/3 Clinical Activity in All Tumor Types Treated	**6** Partial Responses by Target Lesion Assessment	**4** RECIST PRs in MPM (3) & Ovarian Cancer (1)
81% Disease Control Rate (DCR)	**5.9** mPFS (months) for MPM Patients	**11.2** mOS (months) for MPM Patients

LD, Lymphodepletion; PR, Partial Response; ORR, Overall Response Rate; MTD, maximum tolerated dose; MPM, malignant pleural mesothelioma

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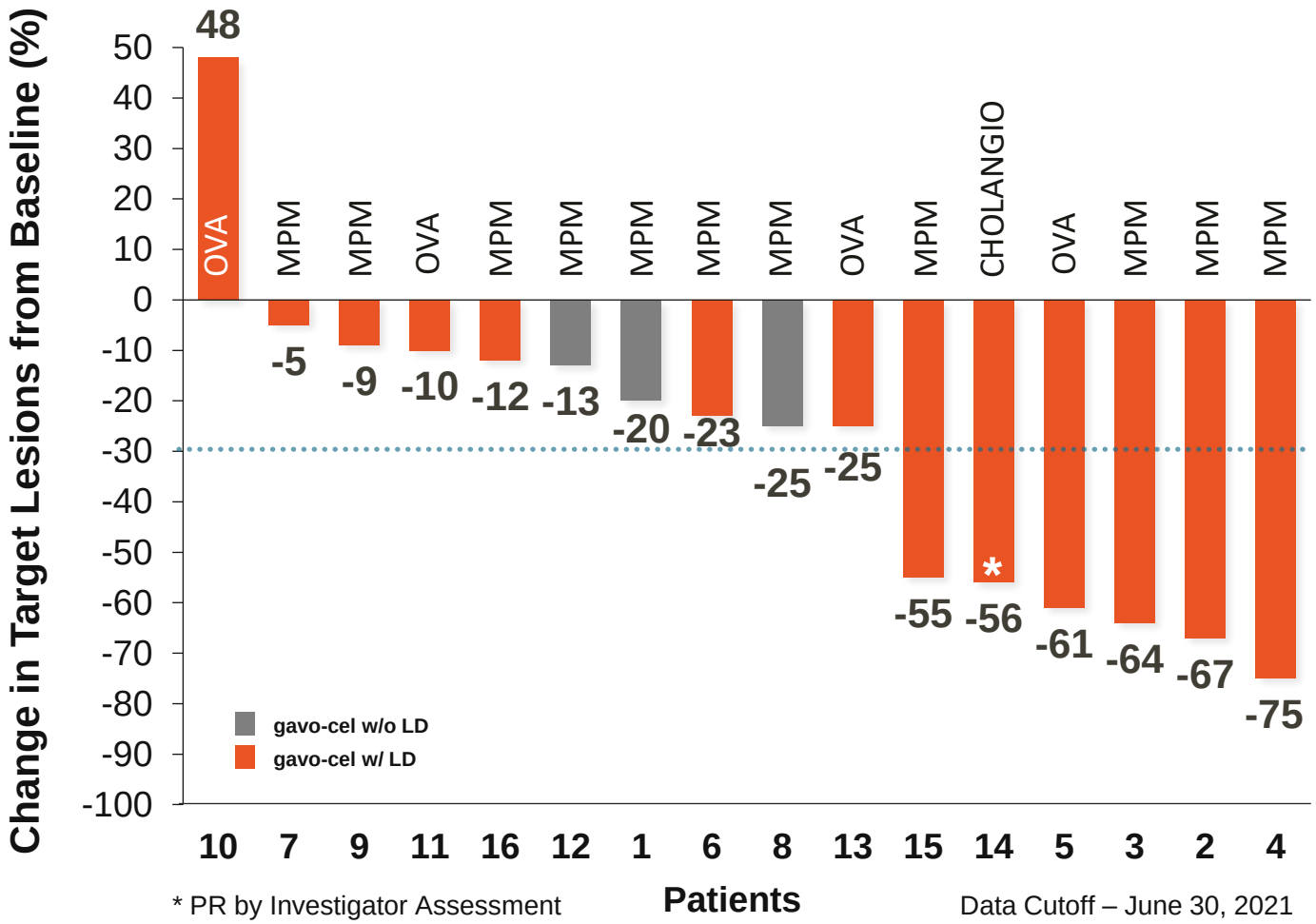
Consistent Tumor Regression in Patients with gavo-cel

Overall Response Rate 25%, Disease Control Rate 81%



* PR by Investigator Assessment

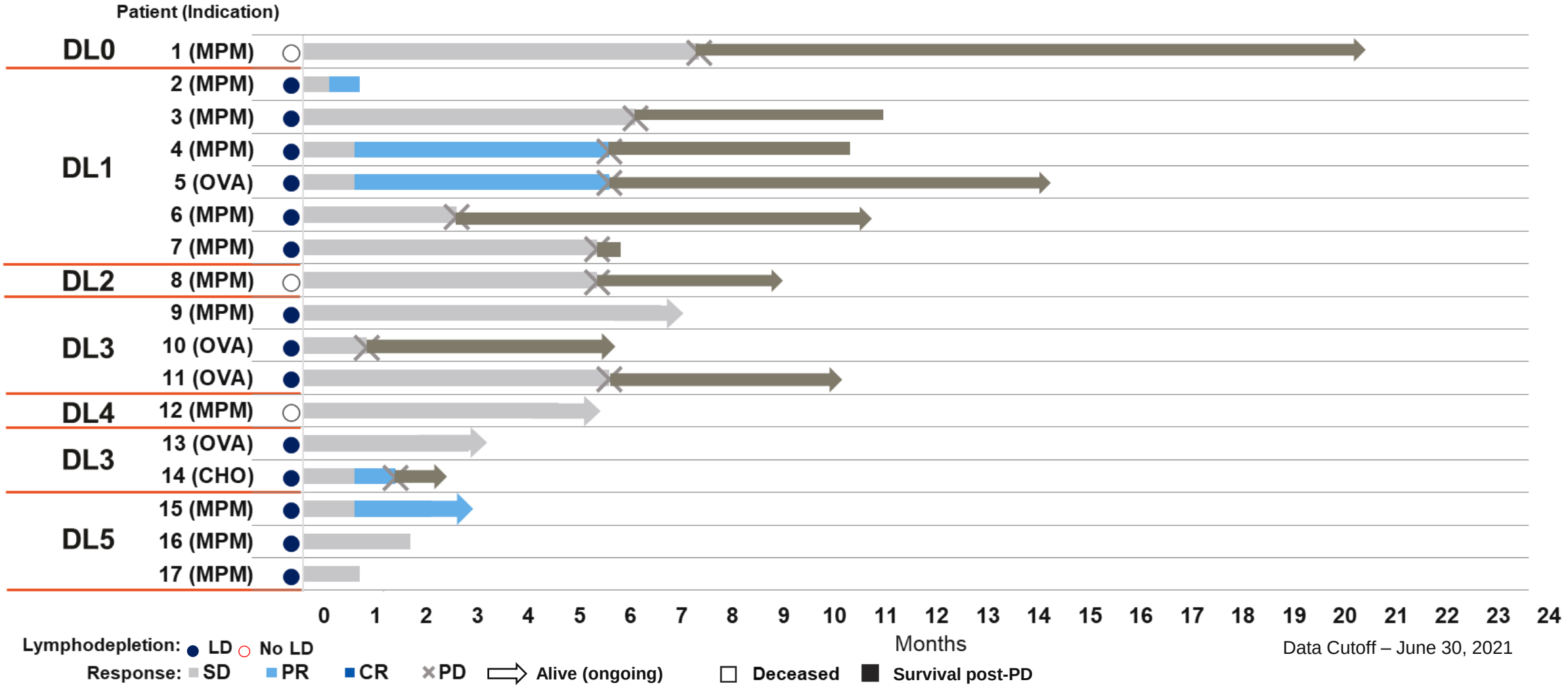
Data Cutoff – June 30, 2021

	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

MPM, malignant pleural/peritoneal mesothelioma; OVA, ovarian cancer; CHOLANGIO, cholangiocarcinoma; DL, dose level; LD, lymphodepletion; DCR, disease control rate; ORR, overall response rate

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



Mesothelioma Represents a Significant Market for gavo-cel

~$500M Consensus Global Peak Sales of Gavo-cel*

- MPM is a devastating disease that is highly aggressive and represents a majority of mesothelioma cases
- Existing treatment options are extremely 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: 2,100
Est. Gavo-cel Opportunity: 1,300

EU Population: 3,000
Est. Gavo-cel Opportunity: 1,900

Mesothelin Expression

~70% of Epithelioid MPM Patients with Mesothelin Surface Expression
2+ or 3+ in ≥50% Tumor Cells

85% of MPMs are Epithelioid MPM

Refs: gavo-cel Phase 1/2 clinical trial, Inaguma 2017, SEER Statistics 2020, Morello 2016, Tozbikian 2014

MPM, mesothelioma; PFS, progression free survival; OS, overall survival; ORR, overall response rate

*Consensus based on average analyst estimates covering the company

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gavo-cel Clinical Development Plan Goes Beyond MPM

Pursuing Speed and Breadth of Opportunity

PHASE 2 GOAL:

DEEPER, MORE DURABLE RESPONSES IN EARLIER LINES OF THERAPY

SRT identified RP2D at $1x10^8/m^2$

MPM: fastest route to registrational trial

Ovarian to follow quickly, refined admission criteria allows treatment of NSCLC patients

Phase 2 Trial Modifications

- Lower currently high, stringent mesothelin threshold for NSCLC and cholangiocarcinoma
- Evaluating impact of PD-1 axis in 2022: combination with Opdivo/Yervoy and TC-510 (PD1xCD28 switch)
- Treatment of earlier line patients and ability to redose
- Ability to move faster without staggering rules and all patients being lymphodepleted

SRT, Safety Review Team; LD, Lymphodepletion; RP2D, Recommended Phase 2 dose; MPM, Malignant Pleural/Peritoneal Mesothelioma; NSCLC, Non-Small Cell Lung Cancer

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TC-510: PD1xCD28 Switch

Stage of Development: IND-Enabling

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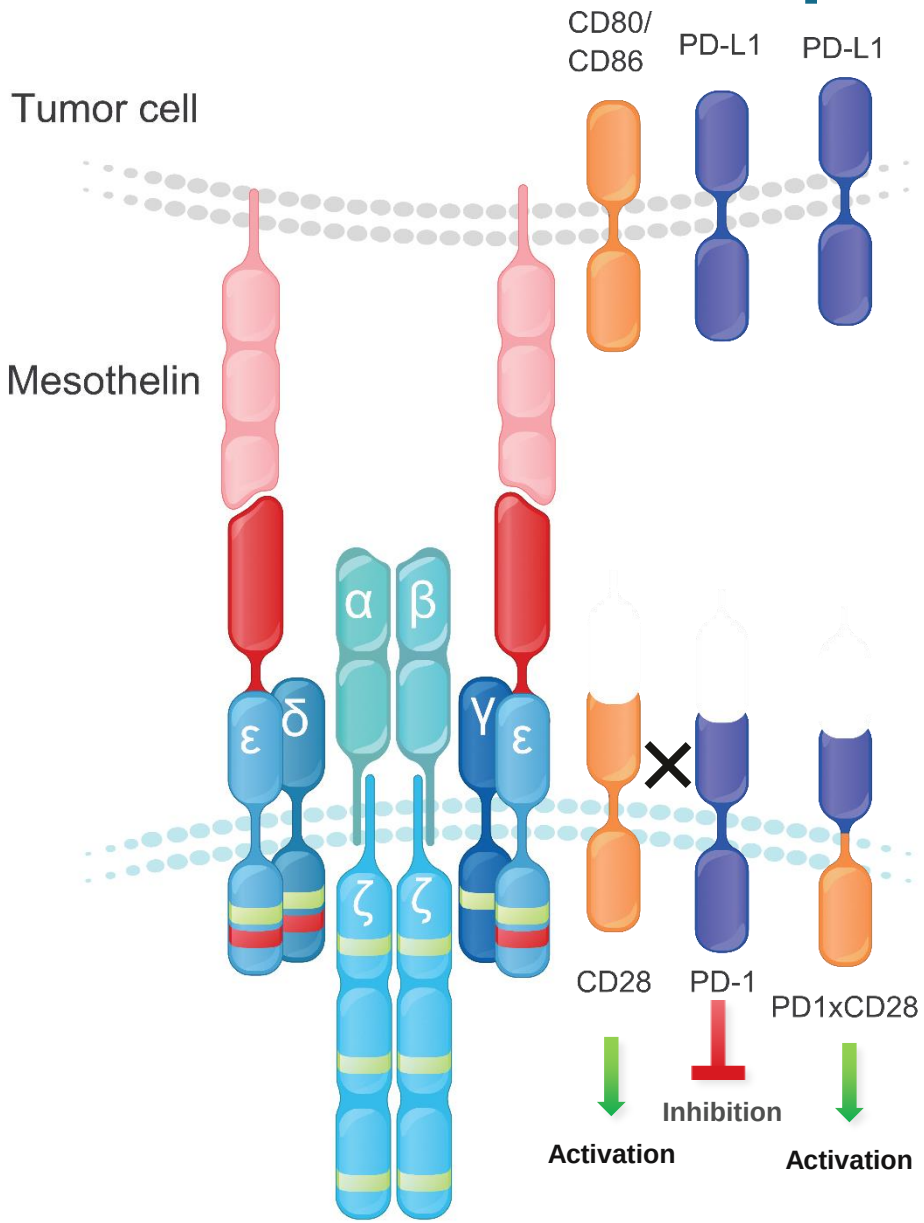
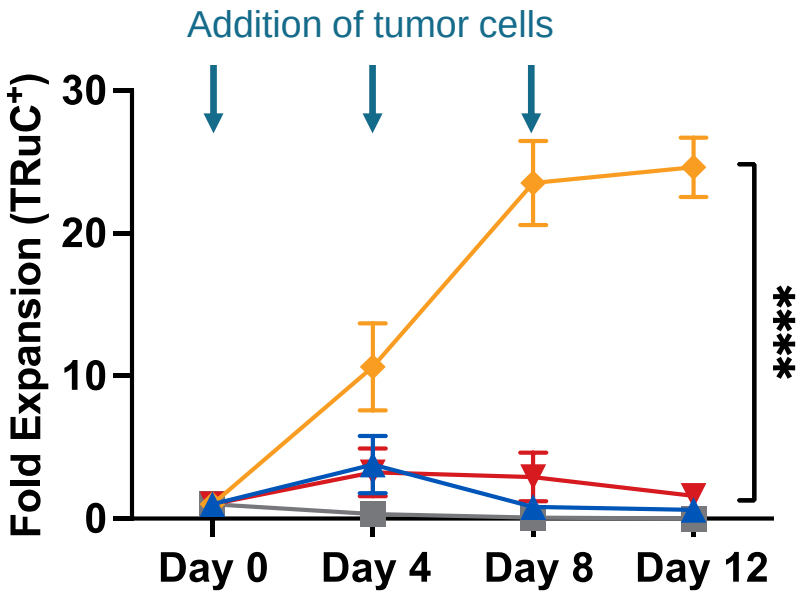
Enhancing gavo-cel with a PD1xCD28 Switch Receptor

- PD1xCD28 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 PD1xCD28 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

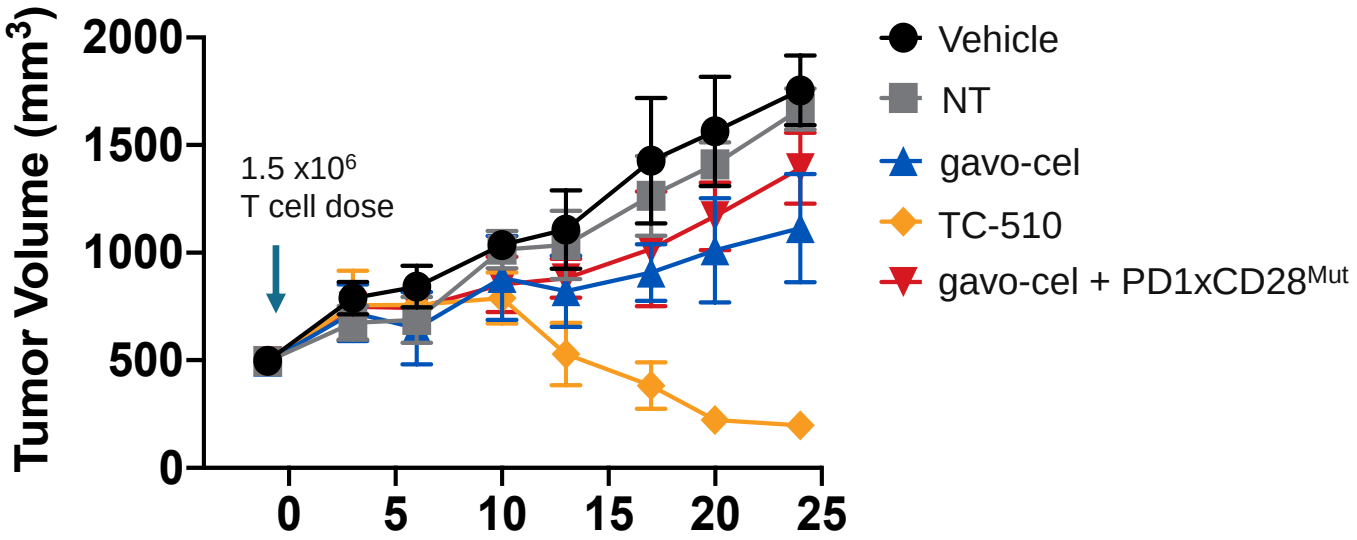


Against Tumors with High PD-L1 Expression, TC-510 Shows Enhanced Proliferation and Superior Efficacy

Expansion upon Repeated Stimulation



Anti-Tumor Activity in Mouse Model



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

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Allogeneic TRuCs

Stage of Development: Lead Optimization

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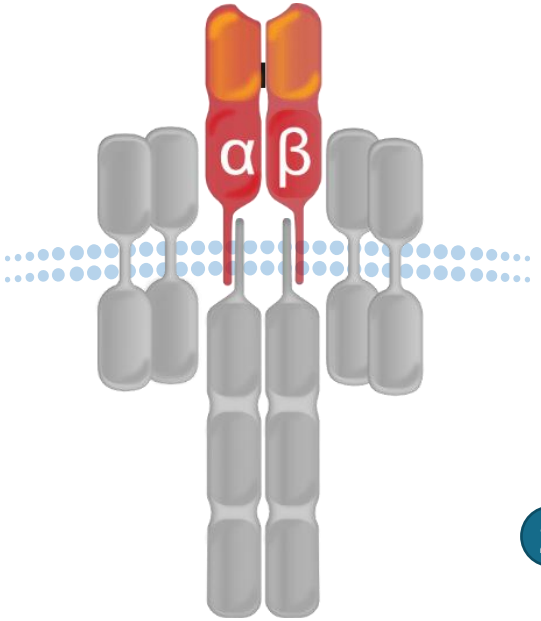
Allo TRuC-T Cells Generated in a Two-Step Process

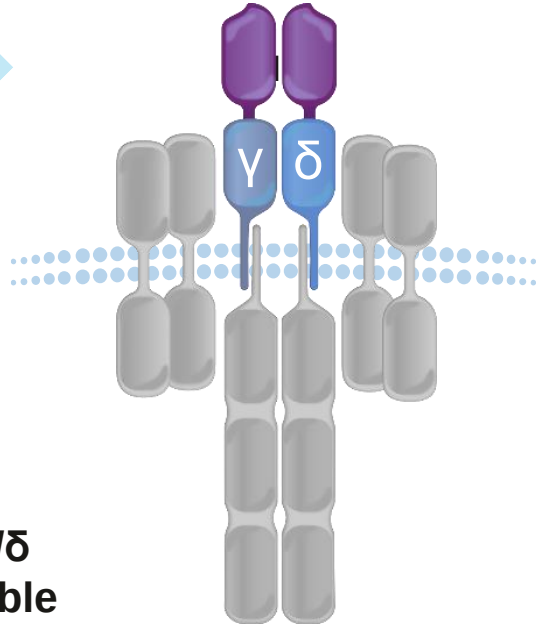
Natural TCR (Alloreactive)

Natural TCRα_v and β_v domains

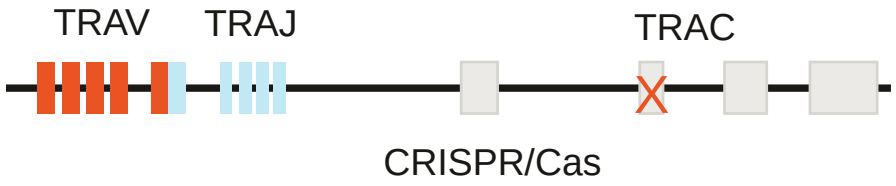


TRuC TCR (Not alloreactive)

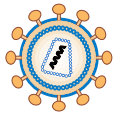
sdAb binder



1 **Knocking-out TRAC locus to delete TCR**



2 **Introduction of mouse TCRα/β or human TCRγ/δ constant regions tethered to sdAb binder to enable TCR assembly**



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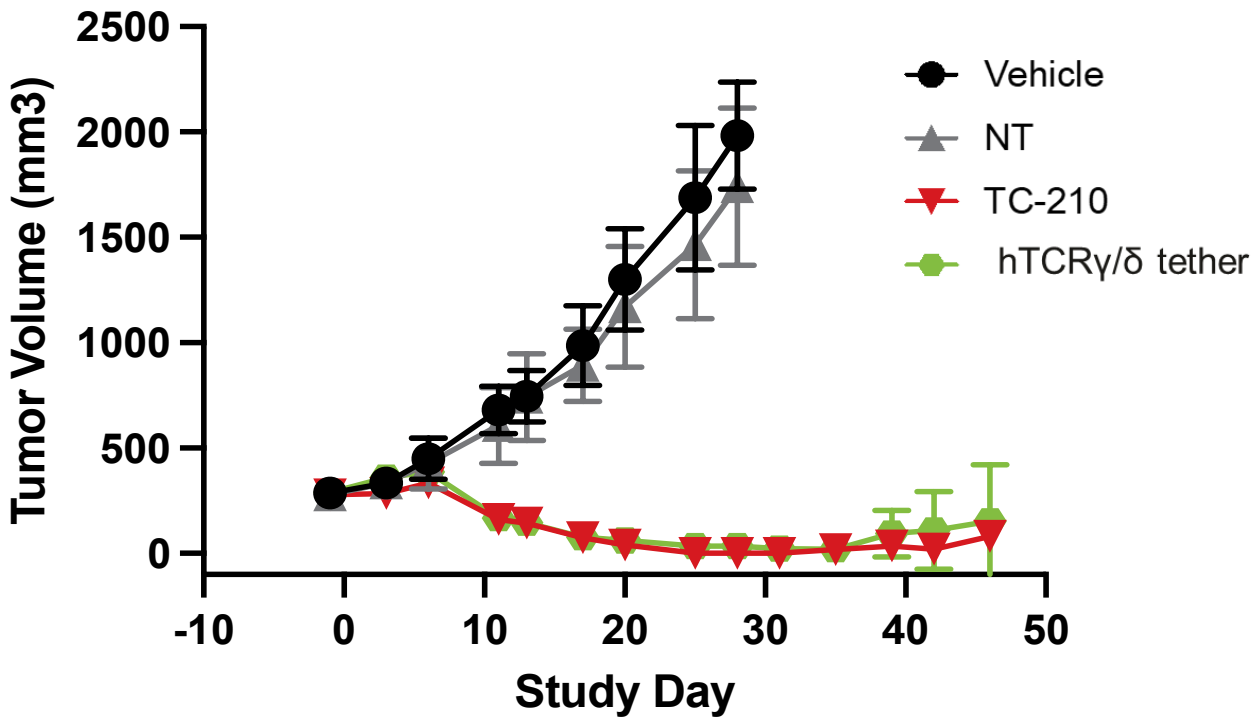
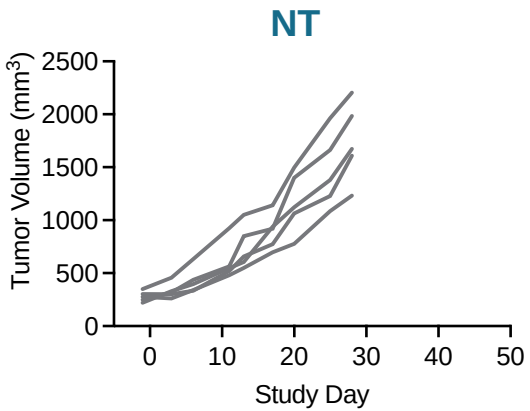
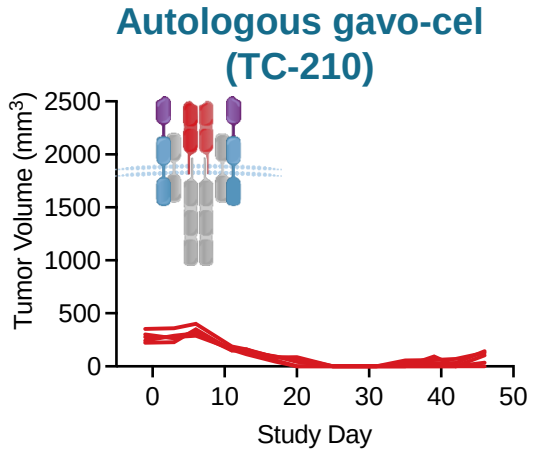
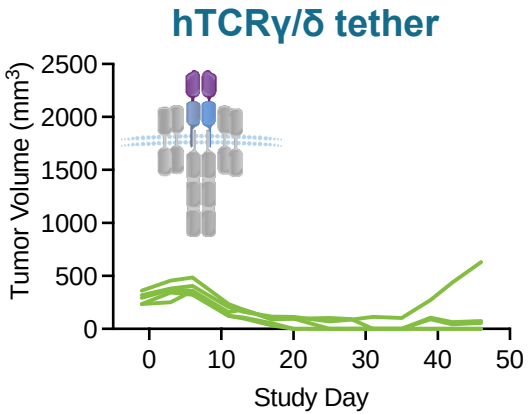
Equivalent Anti-Tumor Activity of gavo-cel with Allogeneic TRuC-T Cells









NT, non-transduced

Commitment to Partnering to Help Maximize the TRuC Platform

Bristol Myers Squibb™

- **Established October 2021**
- Clinical trial collaboration agreement to evaluate gavo-cel in combination with *Opdivo* and *Yervoy* in Phase 2 clinical trial for treatment refractory mesothelin-expressing solid tumors

arbor biotechnologies

- **Established January 2022**
- Strategic research collaboration and non-exclusive license agreement focused on development of allogeneic TRuC-T cell therapies

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Upcoming Milestones

Clinical Programs

1H22 IND filing for TC-510

1H22 Initiation of Phase 2 expansion for gavo-cel

1H22 gavo-cel Phase 1 data summary

1H22 Initiation of Phase 1 for TC-510

2H22 Interim Data Update from gavo-cel Phase 2

2H22 Interim Data Update from TC-510 Phase 1

Pipeline

2H22 IND-enabling studies for TC-520

2H22 Lead candidate identification allogeneic program

~$296M
Cash as of 3Q21

Runway into 2024

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THE POWER OF tomorrow
Engaging the TCR to Transform
the Treatment of Solid Tumors
Thank You
TCR2
THERAPEUTICS