Ziopharm ONCOLOGY

38th Annual JP Morgan Healthcare Conference

16 January 2020

Forward Looking Statements

This presentation contains certain forward-looking information about Ziopharm Oncology, Inc. that is intended to be covered by the safe harbor for "forward-looking statements" provided by the Private Securities Litigation Reform Act of 1995, as amended. Forward-looking statements are statements that are not historical facts, and in some cases can be identified by terms such as "may," "will," "could," "expects," "plans," "anticipates," and "believes." These statements include, but are not limited to, statements regarding the Company's business and strategic plans, the availability of cash resources, and the progress and timing of the development of Ziopharm's research and development programs, including the timing for the initiation and completion of its clinical trials. Although Ziopharm's management team believes the expectations reflected in such forward-looking statements are reasonable, investors are cautioned that forward-looking information and statements are subject to various risks and uncertainties, many of which are difficult to predict and generally beyond the control of Ziopharm, that could cause actual results and developments to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. These risks and uncertainties include among other things, changes in our operating plans that may impact our cash expenditures; the uncertainties inherent in research and development, future clinical data and analysis, including whether any of Ziopharm's product candidates will advance further in the preclinical research or clinical trial process, including receiving clearance from the U.S. Food and Drug Administration or equivalent foreign regulatory agencies to conduct clinical trials and whether and when, if at all, they will receive final approval from the U.S. FDA or equivalent foreign regulatory agencies and for which indication; the strength and enforceability of Ziopharm's intellectual property rights; competition from other pharmaceutical and biotechnology companies as well as risk factors discussed or identified in the public filings with the Securities and Exchange Commission made by Ziopharm, including those risks and uncertainties listed in Ziopharm's quarterly report on Form 10-Q for the quarter ended September 30, 2019 filed by Ziopharm with the Securities and Exchange Commission. Readers are cautioned not to place undue reliance on these forward-looking statements that speak only as of the date of the presentation, and we do not undertake any obligation to revise and disseminate forward-looking statements to reflect events or circumstances after the date hereof, or to reflect the occurrence of or non-occurrence of any events.

Ziopharm Today

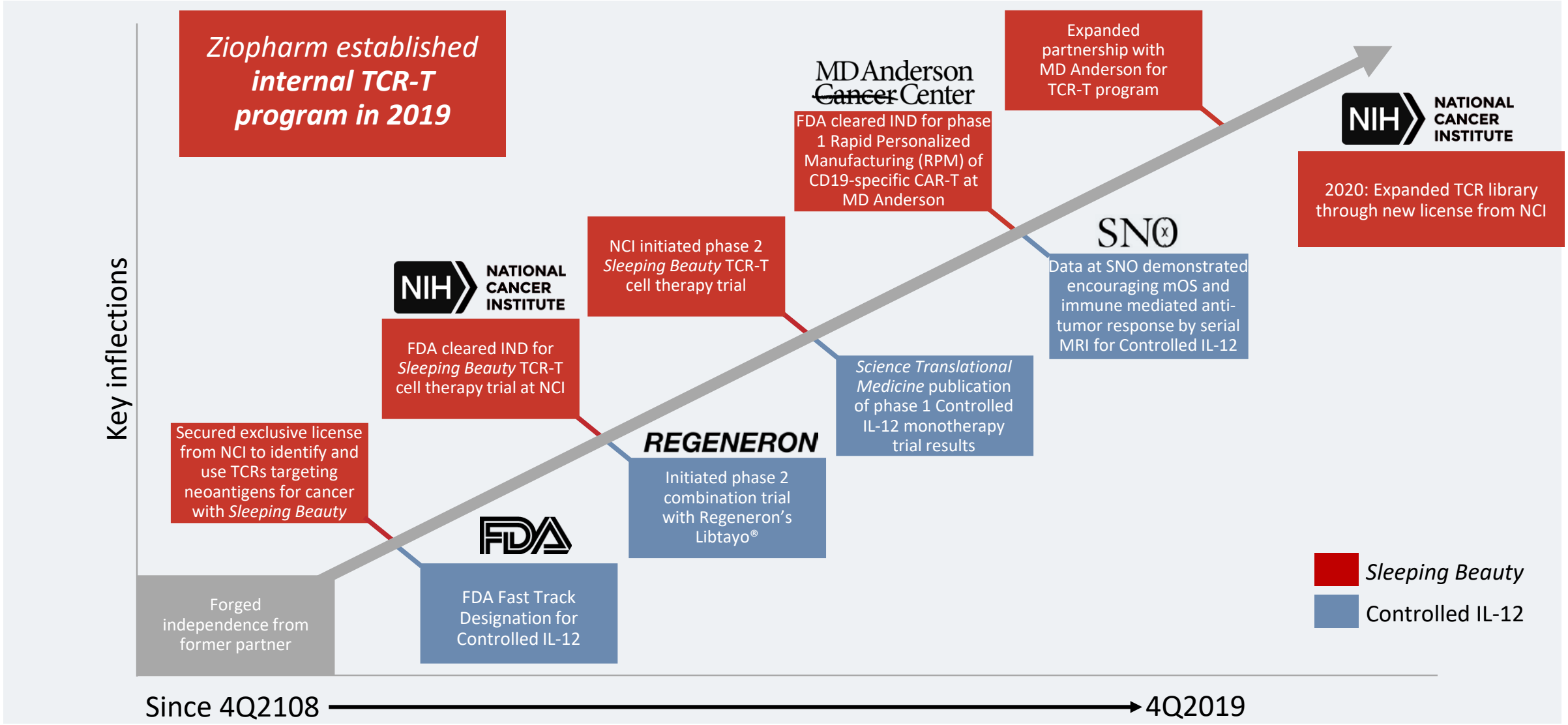
Ziopharm Oncology is an **independent** immuno-oncology company focused on developing **individualized**, cost-effective therapies primarily aimed at the large unmet needs in **solid tumors**

Ziopharm Vision for Solid Tumors

To provide **next-generation therapeutic options** to treat every patient with a solid tumor

Highlights	
First Movers	Pioneers in non-viral T-cell therapies and cytokine biology with IL-12
Proven	Multiple peer-reviewed publications and multi-year clinical data
Partners	Embedded at NCI and MD Anderson with phase 2 and phase 1 T-cell INDs cleared; more trials planned
Intellectual Property	Exclusive license of leading TCR library; new agreement to facilitate rapid expansion
Upcoming Data	Data across all platforms expected in 2020
Target Markets	Commercial rights to *multiple* billion-dollar markets

Strategic Milestones Achieved in One Year Since Independence



Competitive Advantage: Differentiated Positioning in Solid Tumors

Cancer Segment	Annual US Patient Population	Commercial Opportunity in the US	Multiple shots on goal
Solid tumors	~1.5 million[1]	For ***every 1% market penetration*** with illustrative cost of $300,000 ***~$4.5 billion*** *in potential revenues*	TCR-T and IL-12

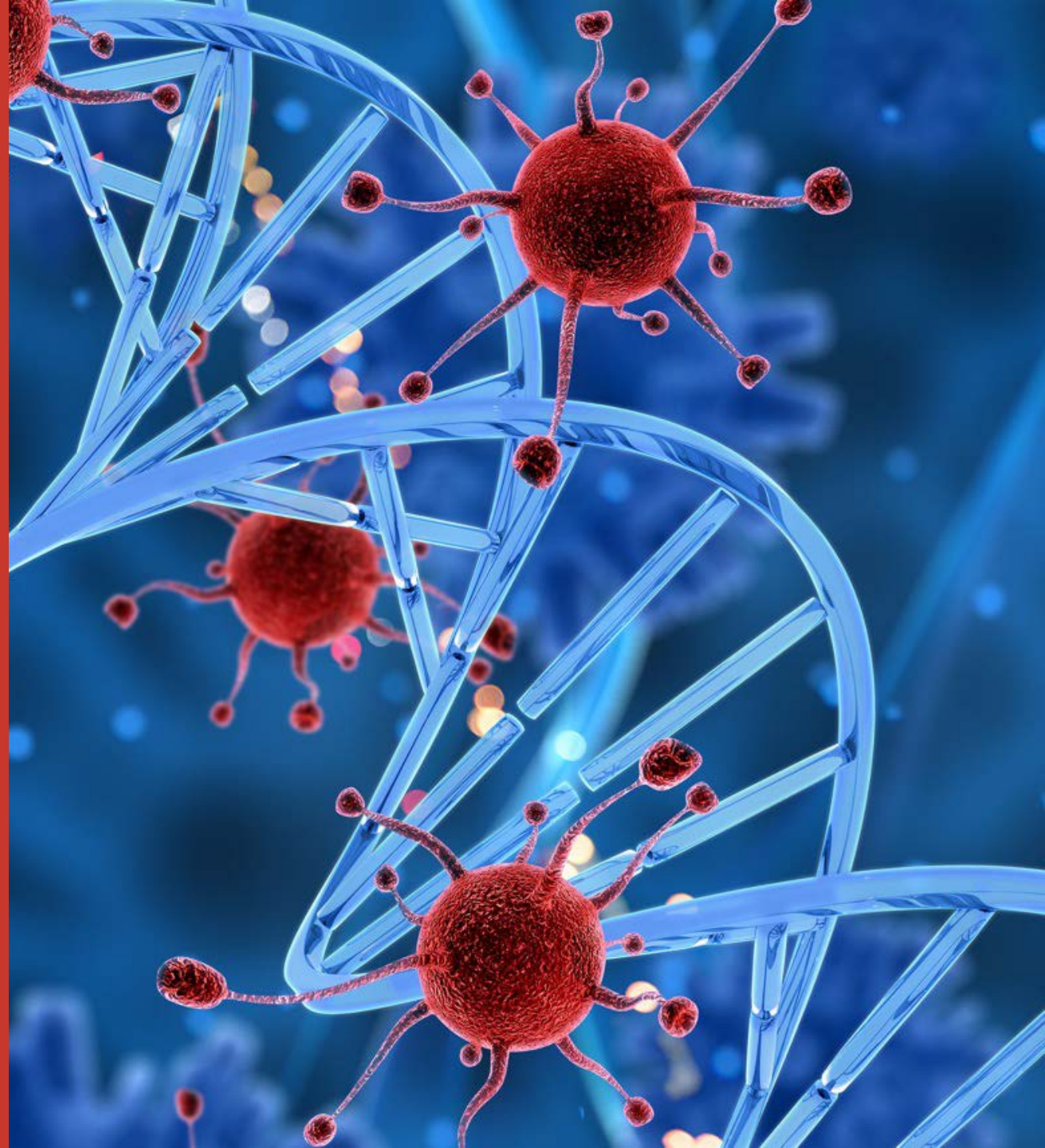
Ziopharm's complementary and unique suite of technologies

- TCRs targeting neoantigens outside and inside hotspots
- Personalized TCRs (made real-time)
- Library of TCRs (pre-made)
- TCRs against multiple targets per patient
- Non-viral gene transfer
- Cytokine biology

1. 2018, International Agency on Research for Cancer, *Cancer Facts & Figures*, 2018, American Cancer Society

Sleeping Beauty
Solid Tumor TCR-T Program

Leaders in clinical stage non-viral manufacturing of TCR-T therapies



Patient-Centric Approach Grounded in Proven Science

NCI and Ziopharm shared rationale why TCR-T will be a best practice for treating solid tumors

- We believe targeting neoantigens is the best opportunity to target solid tumors
- T-cell receptors (TCRs) are optimally built to recognize neoantigens
- We believe that T cells from peripheral blood (PB) genetically modified to express TCRs targeting neoantigens are best product to infuse
- *Sleeping Beauty* system is an ideal solution to genetically modify T cells (TCR-T)

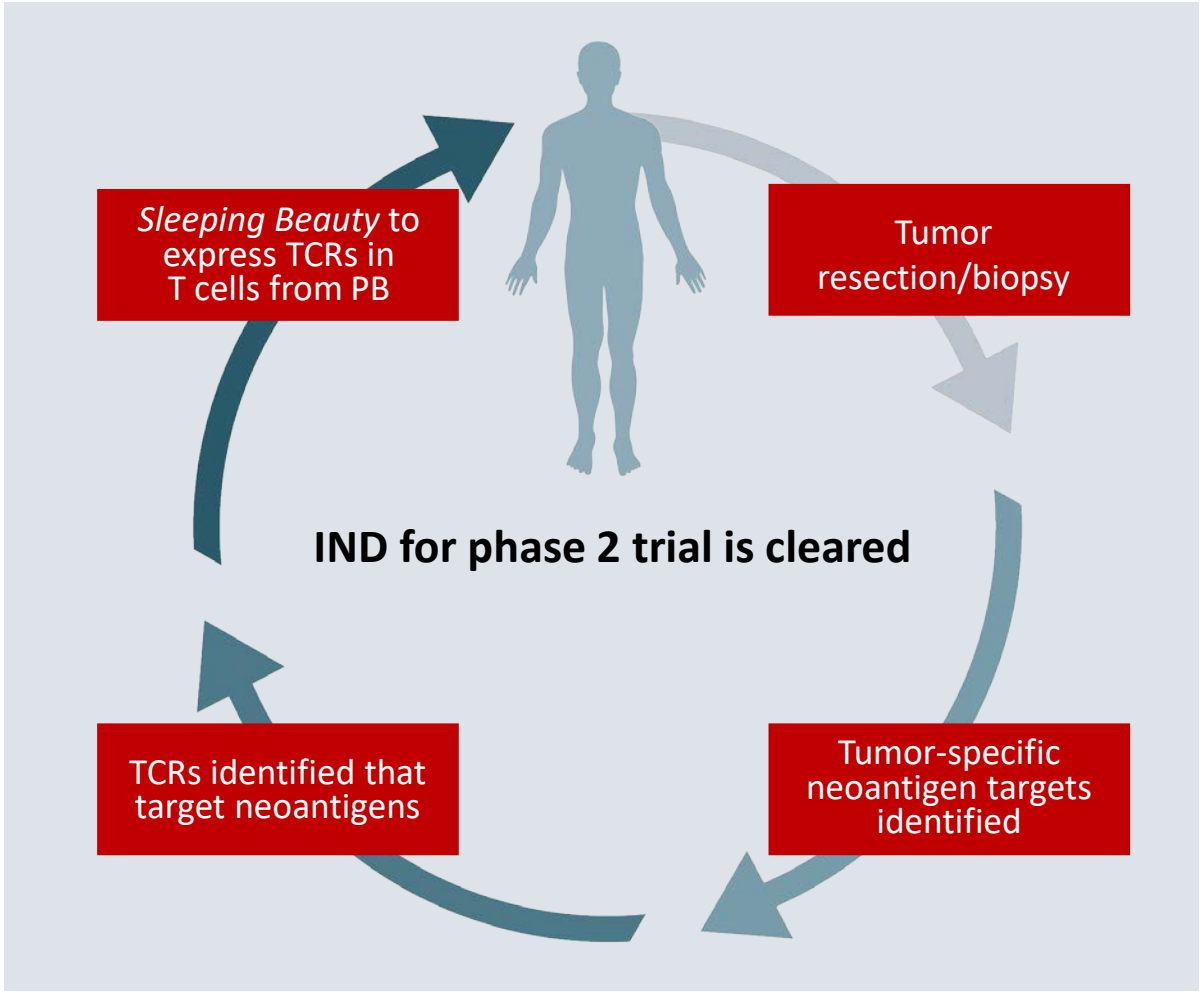
"The neoantigen TCR gene-modified cells can recognize and destroy the autologous cancer in vitro."

— Dr. Steven Rosenberg

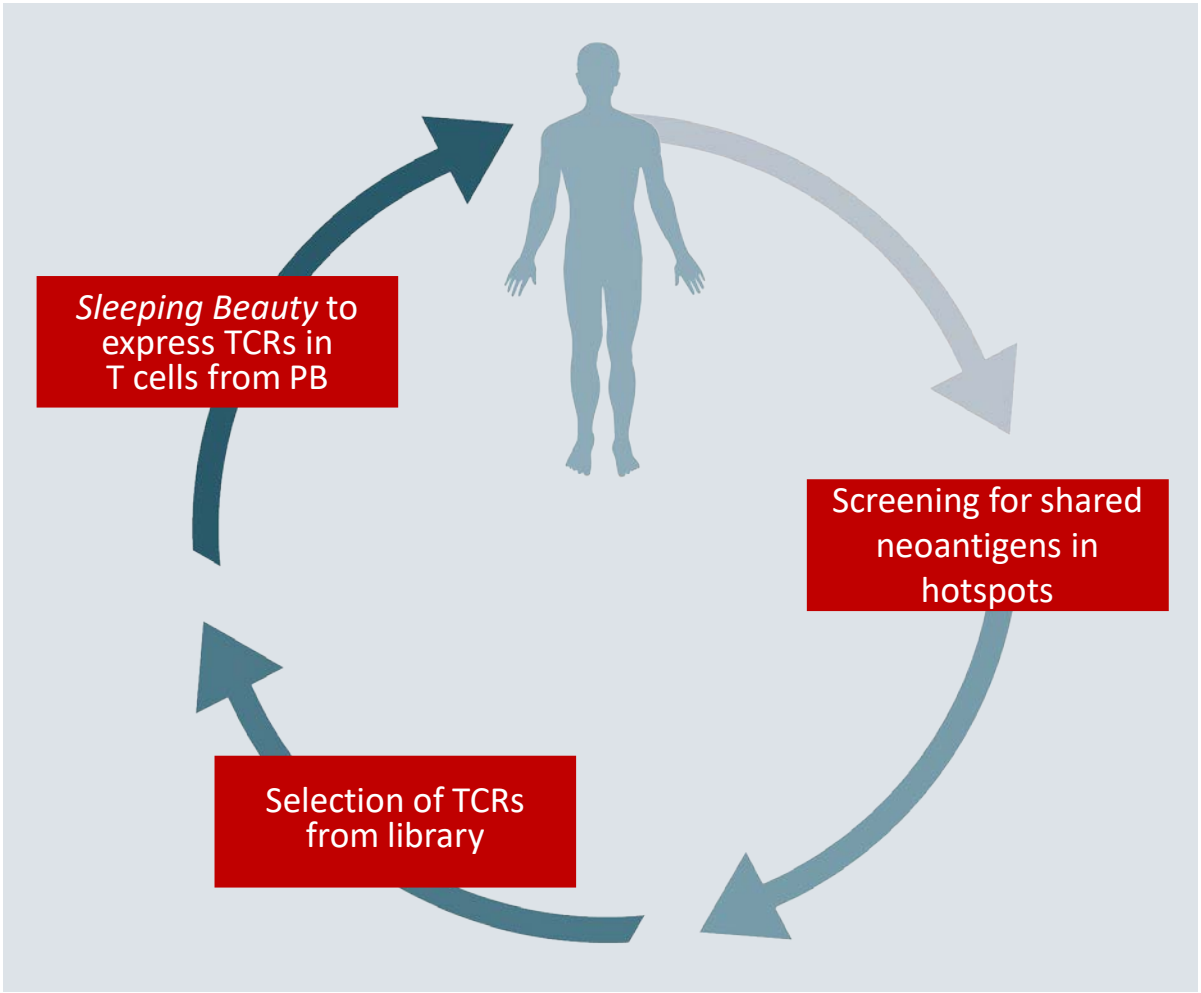
Source: https://www.cancer.gov/about-cancer/treatment/clinical-trials/search/v?id=NCI-2019-06775&loc=0&q=sleeping%20beauty&rl=1

Two Options to Treat All Patients With a Solid Tumor

Personalized TCR-T Process



Library TCR-T Process



First-in-Human Phase 2 *Sleeping Beauty* TCR-T Trial at NCI

NCI Surgery Branch and Dr. Steven Rosenberg
are world experts in identifying neoantigens and TCRs, and Ziopharm is a proven leader in *Sleeping Beauty*

A Phase 2 Study Using the Administration of Autologous T-Cells Engineered Using the Sleeping Beauty Transposon/Transposase System to Express T-Cell Receptors Reactive Against Mutated Neoantigens in Patients With Metastatic Cancer

Enrollment:

- Patients with solid tumors including:
  - gastrointestinal
  - genitourinary
  - ovarian
  - breast
  - non-small cell lung cancers
  - glioblastoma

Endpoints:

- Primary: tumor response rate
- Secondary: safety and tolerability

NIH U.S. National Library of Medicine
ClinicalTrials.gov

NCI PROTOCOL ID	INVESTIGATOR
NCI-19-C-0143	Steven A. Rosenberg, M.D., Ph.D.

NCI TCR-T Trial Led by Dr. Rosenberg

First-in-human phase 2 TCR-T *Sleeping Beauty* trial being undertaken at NCI by Dr. Steven Rosenberg, Chief of the Surgery Branch at NCI

- NCI commencing with phase 2 overcomes the need to undertake T-cell dose escalation studies; significant time and capital savings in drug development
- Given the importance of this first non-viral TCR trial at NCI, they have invested time and talent to ensure the best possible patient outcomes at the outset; a patient-first approach
- NCI Surgery Branch considers this trial a top priority and will dictate the timing of first patient, as well as all subsequent patients enrolled
- NCI compiling a growing list of potential patients with TCRs procured for *Sleeping Beauty*

Building on Foundational Science; Moving to a Commercial Pathway

2019 Focus: Assembling the infrastructure

- Technology from NCI
- TCRs for library from NCI
- Personnel from NCI, MD Anderson, other leading centers and companies
- Research agreement with MD Anderson

2020 Priorities: Delivering the technology

- Implementing and improving upon NCI's technology at MD Anderson
  - Planning for Ziopharm TCR-T trials with BOTH designs
  - Expanding Ziopharm TCR library
  - Access to patients with multiple solid tumors
  - Shortening time to treatment
- Engaging with FDA

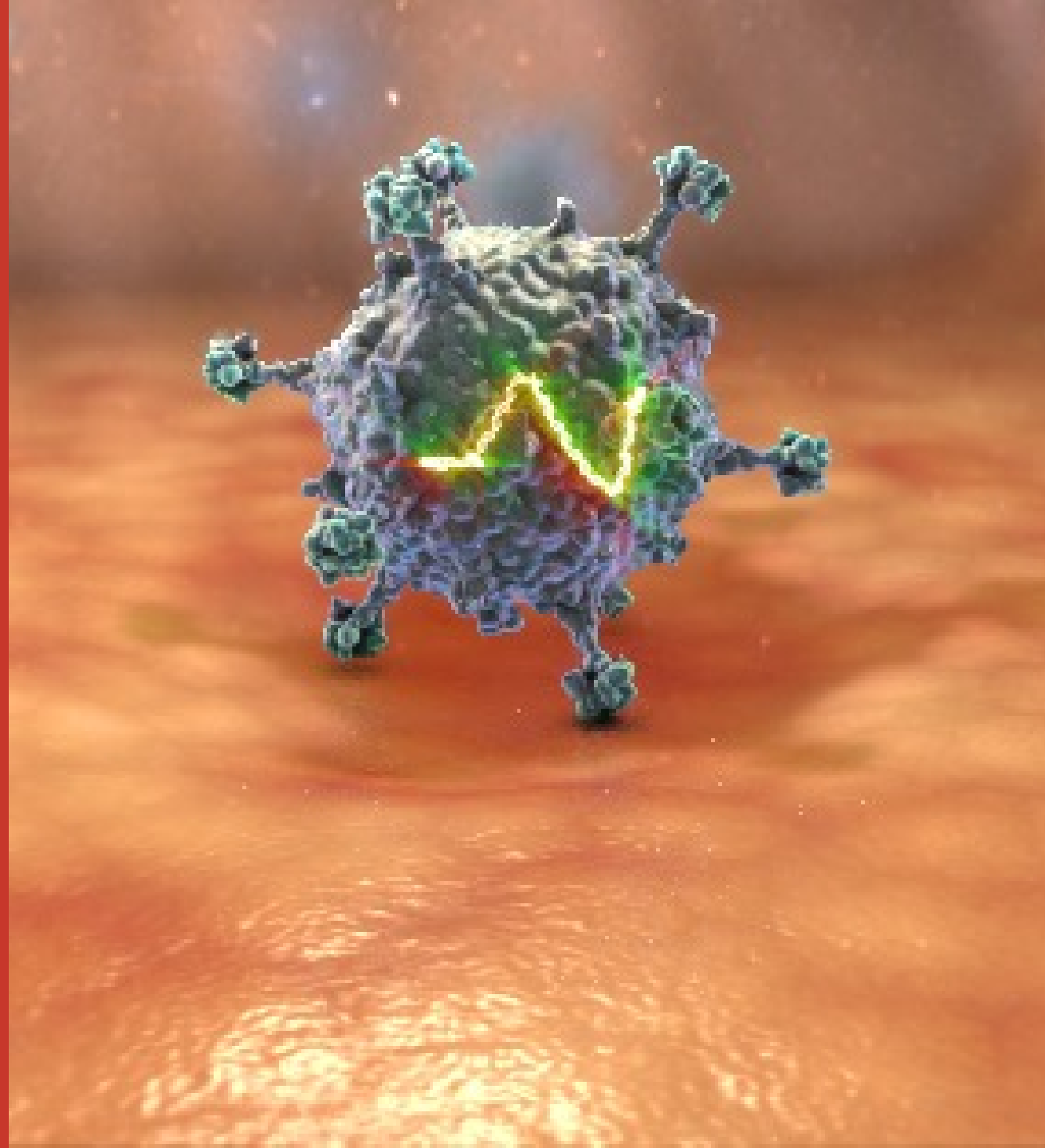
Our path to treat solid tumors with TCR-T

- ✓ Two approaches to generating TCR-T; personalized and hotspot
- ✓ Playbook for competitive advantage
- ✓ Control of our development
- ✓ Aligned with leading cancer centers to run trials

Ziopharm to execute on both TCR-T trial options in 2020 and beyond

Controlled **IL-12 Platform**

Inducing immune responses;
turning “cold” tumors “hot”



Cytokine Biology is a Hot Space for Drug Development

Ziopharm is a world leader in dosing of IL-12 with deep clinical experience across multiple indications; focus on rGBM for now; ability to expand opportunistically

About IL-12:

- IL-12 is the most powerful pro-inflammatory cytokine and begets other cytokines (like IL-2)
- IL-12 drug development is now possible as the production can be controlled
- IL-12 turns “cold” tumors “hot”, improving T cell access to tumor microenvironment

Ziopharm has:

- Shown that IL-12 can be regulated in 1,000+ doses using switch upon intra-tumor delivery of virus
- Demonstrated that IL-12 recruits and activates T cells within tumors
- Expanded efforts to prove IL-12 can improve immune checkpoint inhibitors

Controlled IL-12 Clinical Experience

Approaches

- Monotherapy
- Combination with PD-1 inhibitors

Data

- Publication of supportive results of phase 1 monotherapy trial in recurrent GBM
- Interim encouraging data presented at 2019 Society for Neuro-Oncology in November

Trials

- Phase 1 monotherapy trial in recurrent GBM
  - Enrollment completed
- Phase 1 combination study with OPDIVO® in recurrent GBM
  - Enrollment completed, including additional patients at highest dose level
- Phase 2 combination trial with Regeneron's Libtayo® in recurrent GBM
  - Additional sites coming online; completion 1H 2020

IL-12 Delivered into rGBM can be Controlled and Improves Survival

Controlled IL-12 in the clinic

- Ad*
- RTS®**
- hIL-12
- Veledimex***
- Low-dose steroids****

* Replication-incompetent adenovirus (delivered Day 0)
** RheoSwitch Therapeutic System®
*** Daily doses of 20 mg (Days 0 to 14)
**** ≤ 20 mg cumulative dexamethasone (Days 0 to 14)

16 month mOS in patients with recurrent disease

Cohort	Cumulative Steroids (Days 0-14)	No. of Subjects	No. of Subjects Alive	Median Survival (95% CI) (mons)	Mean Follow-up (mons)
Unifocal	≤20 mg	20	7	**16.2 (8.9, 18.5)**	12.3
	>20 mg	16	4	9.8 (4.6, 30.2)	9.7

mOS measured from time of re-resection

SNO
Society of Neuro-Oncology, November 2019

Evidence of IL-12 Immune Mediated Anti-Tumor Response by Serial MRI

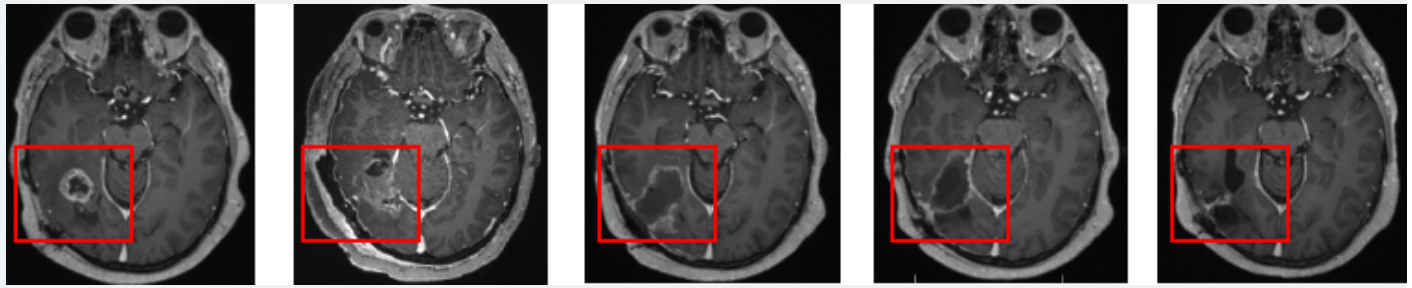
Pre-Baseline (Screening/pre-surgery) SPD: 572 mm^2

Baseline (time of Ad+V) SPD: 120 mm^2

28 Days after Ad+V SPD: 300 mm^2 Pseudoprogression

56 Days after Ad+V SPD: nonmeasurable Partial Response

40 Weeks after Ad+V SPD: nonmeasurable Partial Response

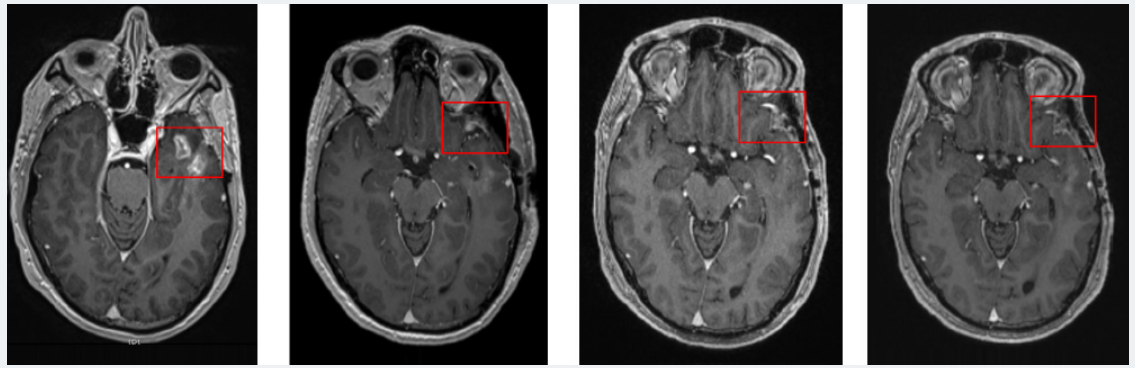


Pre-Baseline (Screening/pre-surgery) SPD: 683.6 mm^2

Baseline (at time of Ad+V, Day 0) SPD: 110.7 mm^2

12 Weeks after Ad+V SPD: 185.3 mm^2 Pseudoprogression

36 Weeks after Ad+V SPD: 39.9 mm^2 (64% reduction) Partial Response



SPD: sum of products of bi-perpendicular diameters

Subjects underwent biopsy at suspected progression which confirmed extensive immune (T-cell) infiltrate; Monitoring ongoing

Monotherapy

20mg veledimex monotherapy

Combination with PD-1 inhibitor

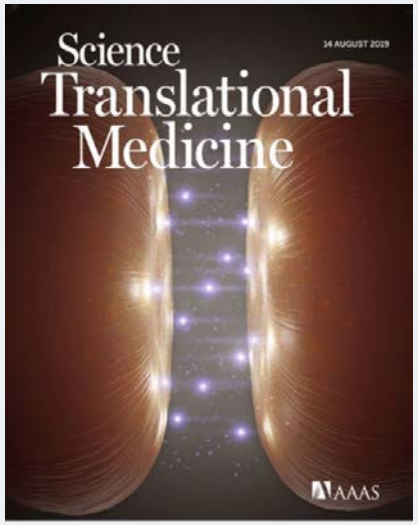
10mg veledimex & 3mg/kg nivolumab

SNO Society of Neuro-Oncology, November 2019

We Believe Controlled IL-12 Can be a Drug for rGBM

Data supports immune mediated anti-tumor effects; will guide later stage development

- Controllable
- Pathology showing influx of immune cells and decrease in tumor cells
- Regression of tumor by serial MRI
- Median overall survival compelling

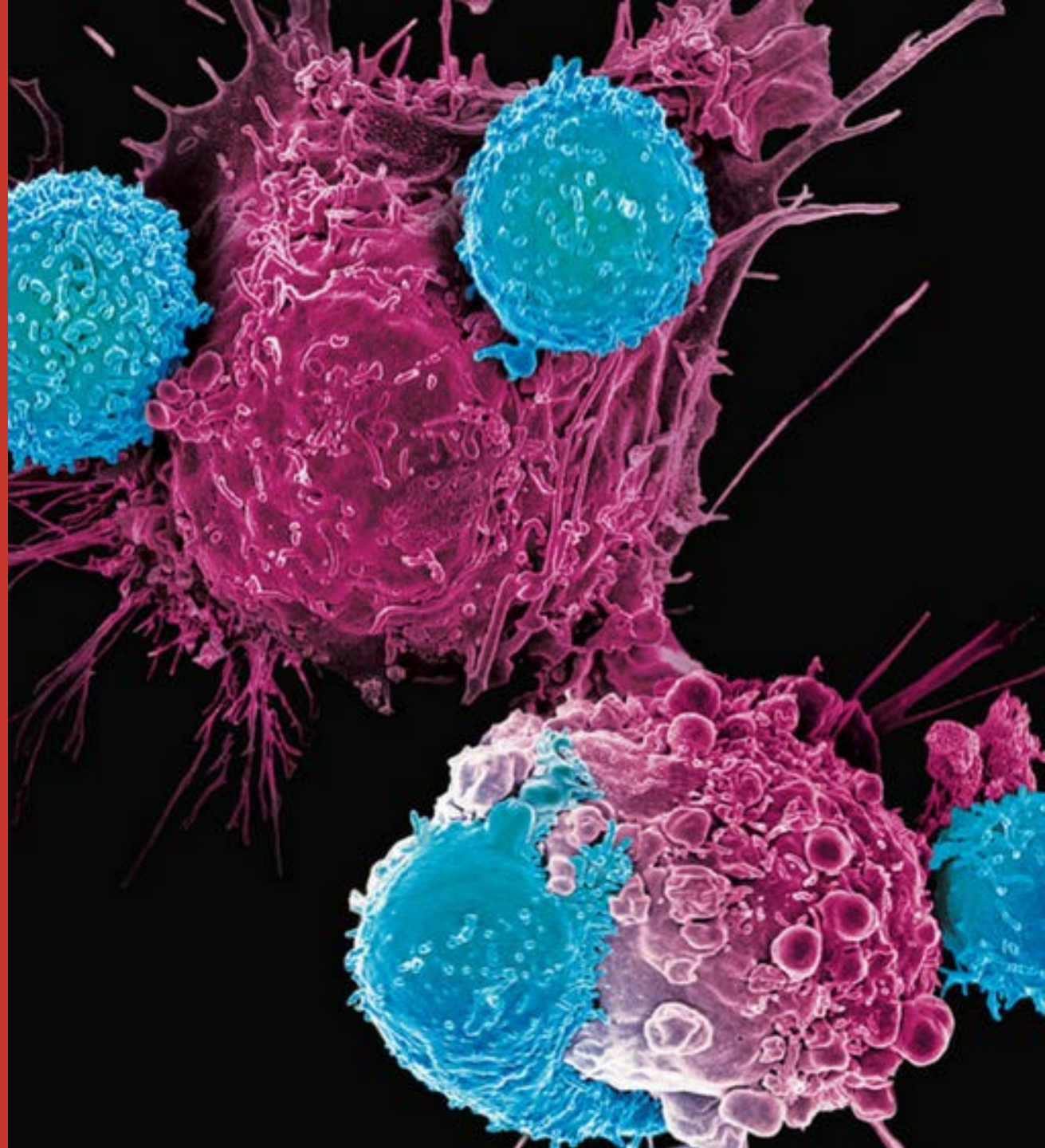


14 August 2019

Opportunities to expand into other tumor indications

Sleeping Beauty
CAR-T CD19

Clinical validation of Rapid Personalized Manufacturing



Treat Patients with Rapid Personalized Manufacturing (RPM)

Providing a solution to cost and complexity of commercial CAR-T today

IND cleared for phase 1 trial to evaluate allogeneic CD19-specific CAR-T

- Infuse as soon as day after gene transfer
- Validate technology, potential commercial opportunity
- Cleared phase 1 IND
- Patients with $CD19^+$ leukemias and lymphomas who have relapsed after allogeneic bone marrow transplantation
- Trial to be conducted at MD Anderson

Ziopharm & Eden BioCell pursuing autologous CD19-specific CAR-T

- US: planned phase 1 clinical trial at MD Anderson
- Greater China: planned phase 1 fully funded through Eden BioCell joint venture
  - Preparation underway for regulatory filing and initiation of clinical trial
  - 50-50 joint venture; up to $35 million funding committed from TriArm Therapeutics

Eden BioCell

TriArm™ THERAPEUTICS

Corporate Summary

Financial Snapshot

Current resources fund operations into 2021; allows visibility into key clinical readouts

Selected Balance Sheet Data

Cash, equivalents and short-term investments as of 9/30/19

$88.4M

At MD Anderson from prepayment for programs to be conducted by the Company as of 9/30/19

$21.5M

Aggregate liquid resources of more than $100M will be sufficient to:

- Fund planned operations and execute our strategy into the first half of 2021 and;
- Allow for visibility into additional clinical milestones / data readouts in our three core programs

Broad Pipeline of Oncology Innovation

Asset	Indication	Phase 1	Phase 2
Sleeping Beauty **TCR-T targeting neoantigens**	Multiple solid tumors	Personalized TCR-T (NCI sponsor)	NIH National Cancer Institute
	Multiple solid tumors	Library TCR-T ("hotspots") (Ziopharm sponsor* at MD Anderson)	Ziopharm Oncology
	Multiple solid tumors	Personalized TCR-T (Ziopharm sponsor* at MD Anderson)	
Ad-RTS-hIL-12 + veledimex	rGBM	Combination with Libtayo® (Ziopharm sponsor)	REGENERON
	rGBM	Combination with OPDIVO® (Ziopharm sponsor)	Ziopharm Oncology
	rGBM	Monotherapy expansion (Ziopharm sponsor)	
Sleeping Beauty **CAR-T**	Leukemia/lymphoma	3rd Gen CD19 with mbIL15 (MD Anderson sponsor)	MD Anderson Cancer Center

Initiated Planned

* Subject to FDA discussions and feedback regarding the trial phase and design.

2020 Near-Term Clinical Milestones Driving Value

1H 2020

Phase 2
Patient dosing in NCI-led ***Sleeping Beauty*** TCR-T trial targeting solid tumors

Phase 1
Enrollment in ***Sleeping Beauty*** CD19-specific CAR-T RPM trial with membrane-bound IL-15 at MD Anderson

Phase 2
Complete enrollment and initial data readout for **Controlled IL-12** in combination with Libtayo®

Phase 1
Data readout of **Controlled IL-12** in combination with OPDIVO®

Phase 1
Data readout from **Controlled IL-12** as monotherapy in expanded cohort

Summary of the Foundation to Target Solid Tumors

1.5 million people are diagnosed with a new solid tumor every year in the US

Ziopharm is pursuing **3 approaches** to treat these patients

1 Personalized TCR-T

- Deliver T cells targeting neoantigens unique to each patient
- TCRs made real-time
- Multiple T-cell products with multiple TCRs per patient

2 Library TCR-T

- Quickly infuse T cells targeting neoantigens shared between patients
- TCRs from pre-existing library
- New line of attack as tumor has not "seen" the 3rd party TCRs

3 Controlled IL-12

- Enable T cells to gain access to tumor
- Controlled expression to dial in therapy and reduce toxicity
- Active as monotherapy and when combined with PD-1 inhibitor

Ziopharm's 2020 Investment Thesis

- **Clinical stage immuno-oncology company developing next generation cell and gene therapies**
  - Catalysts expected in Q1/Q2 of 2020
- **Significant market opportunity for multiple blockbuster therapies**
  - Novel next generation approach to full solid tumor market
  - Strong initial pipeline with potential to rapidly expand into new indications
- **Cutting-edge science and partnerships provide company with competitive edge**
- **Clinical data readouts in 2020**
- **Strengthened corporate leadership team, intellectual property and balance sheet**

Ziopharm ONCOLOGY

Thank you

16 January 2020