IMUGENE
Developing Cancer Immunotherapies

ASX: IMU

IMUGENE & CELULARITY RESEARCH PARTNERSHIP

5th August 2021

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Introduction to Imugene

Imugene is a biotech company headquartered in Australia and publicly traded on the Australian Securities Exchange (ASX:IMU)

2013

Paul Hopper built Imugene around a technology that originated from the Medical University of Vienna

2015

Leslie Chong from Genentech joined Imugene

2017

HER-Vaxx, our HER-2 targeted B Cell Immunotherapy entered the clinic

2018

Licensed extensive B cell portfolio and platform from OSU and Mayo Clinic comprising of PD1, HER1, HER2, HER3, VEGF, IGF-1R, CD28

2019

Completed the acquisition of a prolific oncolytic virus from City of Hope invented by Dr Yuman Fong

MAY 2021

Licensed onCARIytics from City of Hope invented by Dr Y Fong, Dr S Priceman & Dr A Park

AUG 2021

Strategic Partnership with Celularity

Partnership Highlights

- Strategic Research Partnership with Celularity Inc. (Nasdaq: CELU) for the Treatment of Solid Tumors
- Collaboration will explore the therapeutic potential of a combination of Imugene's CF33-CD19 oncolytic virus (**onCARlytic**) and Celularity's CD-19-targetting chimeric antigen receptor (CAR) placental-derived T cell therapy, **CYCART-19**
- **CYCART-19** is a placental-derived T cell therapy engineered with a CAR that is cryopreserved, allogeneic and available off-the-shelf that clinicians can access on demand, enabling repeat dosing/multiple cycles as required in an outpatient setting
- Celularity's off-the-shelf allogeneic **CYCART-19** therapy has shown increased T-cell growth with continuous killing of tumor cells in vivo
- **CYCART-19** demonstrates significantly reduced tumor burden and survival benefit compared to adult blood-derived CD19 CAR-T cells in vivo
- Imugene's novel strategy to treat solid tumors uses **onCARlytics** to prime the tumor cells for destruction by eliciting the expression of a validated tumor marker, CD19, then used as a target for CD19-CAR-T cellular therapy
- Nonclinical in vitro and in vivo combination studies with **CYCART-19 and onCARlytic** to commence in 2021

- Dr. Hariri is the chairman, founder, and chief executive officer of Celularity, Inc., (NASDAQ: CELU).
- Dr. Hariri was the founder and CEO of Anthrogenesis Corporation, and after its acquisition by Celgene Corporation, served as CEO of Celgene Cellular Therapeutics. Dr. Hariri also co-founded the genomic-based health intelligence company, Human Longevity, Inc. Dr. Hariri has served on numerous public boards including Cryoport (NASDAQ:CYRX).
- Dr. Hariri pioneered the use of stem cells to treat a range of life-threatening human diseases. He is widely acknowledged for his discovery of pluripotent stem cells derived from the human placenta, and as a member of the team that discovered the physiological activities of tumor necrosis factor (TNF). Dr. Hariri and his team of scientists were the first to obtain FDA approval to use its cryopreserved allogeneic, off-the-shelf Natural Killer (NK) cell therapy to treat COVID-19 infected adults.
- He holds over 170 issued and pending patents for discoveries including placenta-derived stem cells, which *Nature* recognized as one of the ten most important patent estates in the field. He has authored over 150 published chapters, articles, and abstracts.
- Dr. Hariri was the recipient of the Pontifical Medal for Innovation awarded by Pope Francis in 2018 for his discovery of placental stem cells and advances in immunotherapy and regenerative medicine. Dr. Hariri has received the Thomas Alva Edison Award for invention, in 2007, 2011 and 2021, and is a recipient of the Children's Brain Tumor Foundation's Fred J. Epstein Lifetime Achievement Award. Dr. Hariri was recipient of the Genius of New Jersey Award in 2019 and Pioneer in Medicine and Golden Axon Awards in 2021.
- Dr. Hariri is an Adjunct Professor of Neurosurgery and member of the Board of Overseers of the Weill Cornell Medical. He is a member of the X PRIZE Foundation scientific advisory board for the Archon X PRIZE for Genomics. Dr. Hariri is a trustee and vice-chair of the Liberty Science Center. In 2010 he was appointed a Commissioner of Cancer Research by New Jersey Governor Chris Christie.
- Dr. Hariri completed his undergraduate training at Columbia University School of Engineering and Applied Sciences and Columbia College. He received his M.D. and Ph.D. degrees from Cornell University, where he was the recipient of both the Julian R. Rachele Award and the Doctoral Dissertation Award. He was a surgical resident and fellow in neurosurgery at The New York Hospital-Cornell Medical Center and served as an Assistant Professor of Neurosurgery and Associate Research Professor of Surgery at Cornell and Co-director of the Aitken Laboratory in Neurosurgery.
- When he is not in the laboratory or the corporate boardroom, Dr. Hariri is a jet-rated, high performance commercial pilot with thousands of hours of flight time in over 60 different military and civilian aircraft. He has also produced several feature films, as well as documentaries on global societal issues.

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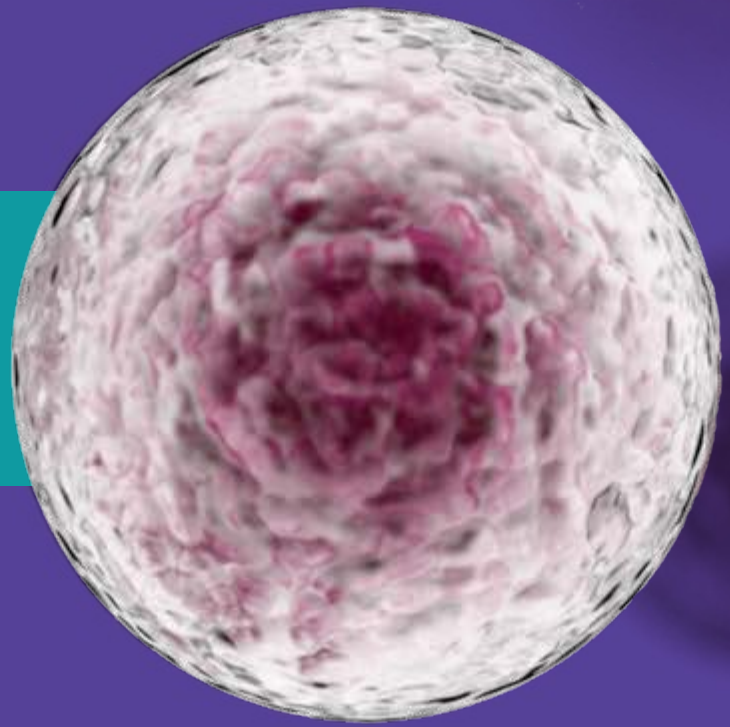
Robert (Bob) J. Hariri, M.D., Ph.D.

Dr. Bob Hariri is an accomplished surgeon, biomedical scientist, and serial entrepreneur in two technology sectors, biomedicine and aerospace.

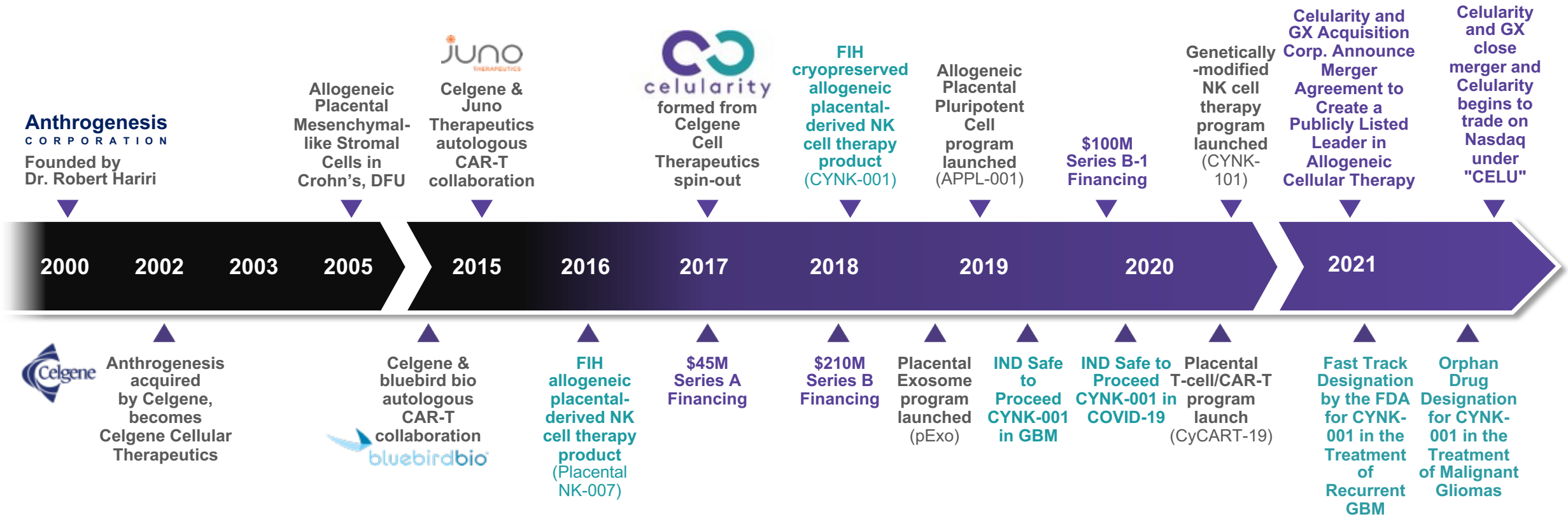
celularity



THE NEXT **EVOLUTION** IN **CELLULAR MEDICINE**

CELULARITY: COMPANY HISTORY

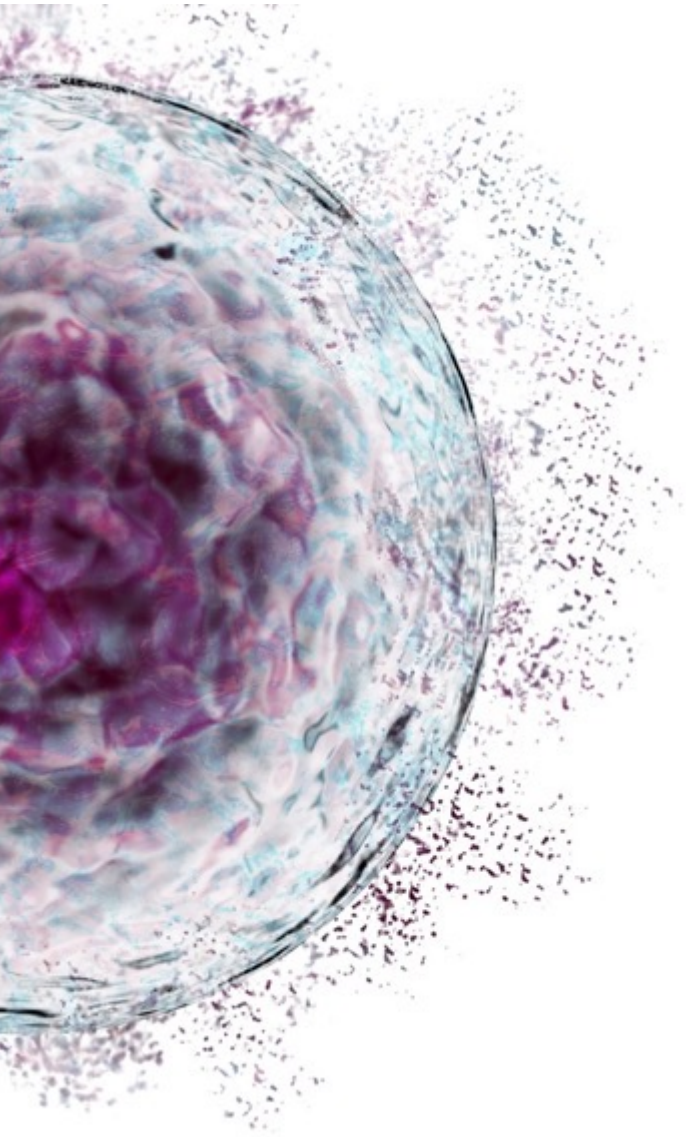
Celgene Spin-out (2017) Leveraging 20+ Years of Cellular Therapeutics Innovation



KEY: *CORPORATE MILESTONE* *CLINICAL MILESTONE* *FINANCIAL MILESTONE*

About Celularity

Next Evolution in Off-the-shelf Allogeneic Cellular Therapies, at Greater Scale & Quality with Attractive Economics



To harness the placenta's unique biology and ready availability to develop therapeutic solutions

Lead the evolution in placental-derived therapeutics:
advance the discovery of the placenta as a limitless, renewable source of neonatal cells, which are biologically preferred to cells from adult bone marrow or peripheral blood

Target large markets with high unmet need:
broad therapeutic application including cancer, degenerative, and infectious diseases

Develop safe and effective therapies:
leverage inherent advantages of placental-derived cells to produce uniform, scalable and optimized cellular therapies

Deliver off-the-shelf, cost effective therapies:
cryopreserved allogeneic cellular therapies that clinicians can access on demand and off-the-shelf, enabling repeat dosing/multiple cycles as required in an outpatient setting

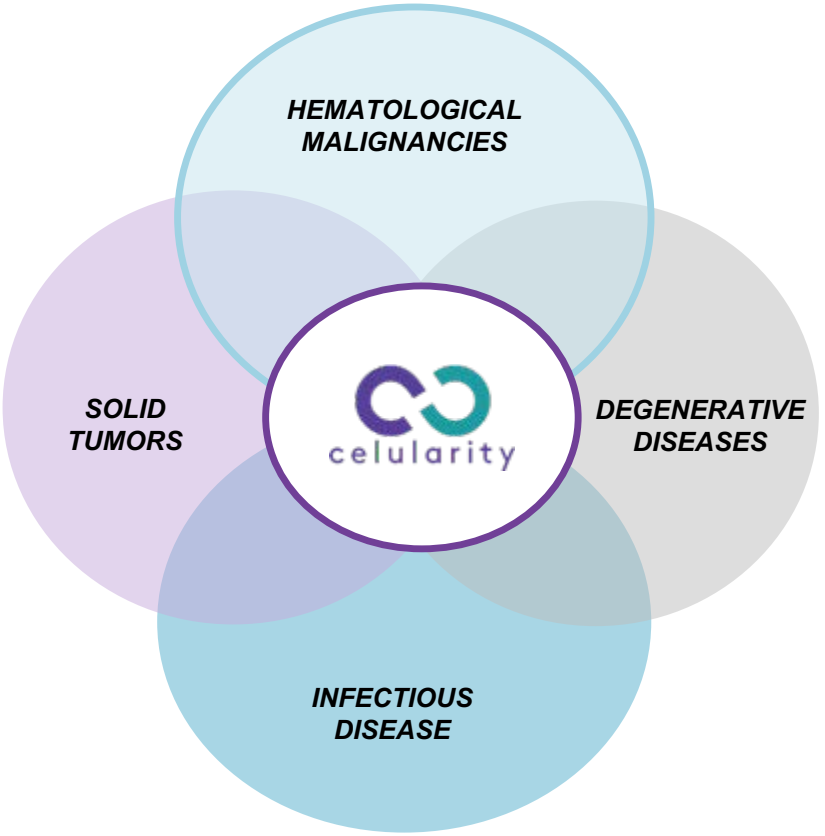
CELULARITY IMPACT™ PLATFORM

Capitalizing on the Benefits of Placental-Derived Cells to Target Multiple Diseases

INHERENT ADVANTAGES OF PLACENTAL-DERIVED CELLS

- ✓ **Abundant and evergreen starting cell source for allogeneic off-the-shelf therapies**
- ✓ **High expandability, persistence and stemness**
- ✓ **Can be administered off-the-shelf, as this abundantly available source material possesses a low potential to provoke an immune response**
- ✓ **No requirement for matching between a patient and donor**
- ✓ **Innate stemness represent a flexible foundation that can be repeatedly genetically modified without losing potency**
- ✓ **100-100K doses of therapeutic per placenta**

Celularity IMPACT™
(*I*mmuno-*M*odulatory *Placental-derived* *A*llogeneic *C*ell *T*herapy)



PIPELINE

Overview

CELL TYPE	PROGRAM	INDICATION	2021	2022
CAR-T	**CyCART-19**	B-Cell Malignancies	IND Submission → Phase I → Phase II	
Unmodified Natural Killer Cell	**CYNK-001** (cryopreserved)	Acute Myeloid Leukemia (AML)	Phase I → Phase II	
Genetically Modified Natural Killer Cell	**CYNK-101 + mAb**	HER2+ Gastric Cancer	IND Submission → Phase I/IIa → Phase II	
Unmodified Natural Killer Cell	**CYNK-001** (cryopreserved)	Glioblastoma Multiforme (GBM)	Phase I/IIa → Phase II	
Placental Mesenchymal-like Stromal Cell	**APPL-001**	Crohn's Disease	IND Submission → Phase I/IIa	

2 Upcoming IND Submissions (2021E) & 5 Clinical Trials by end of 2021

Program Milestones

CYNK-001

- 2H21: Dose Selection & Initiation of Expansion Cohorts (AML)
- 2H21: Establish Phase II Dose (GBM)

CYNK-101

- 2H21: IND Submission
- 2H21: Phase I/IIa Study Start

CyCART-19

- 2H21: IND Submission Expected
- 2H21: Phase I Study Start

APPL-001

- 1H22: Phase I/IIa Study Start

CyCART-19 OVERVIEW

Celularity Approach and Advantages

RATIONALE

- Rationale for greater stemness, expandability, persistence
- Abundant renewable starting cell source for allogeneic therapies
- Potential for improved safety profile due to immunological naivety

KEY HIGHLIGHTS

- Celularity has established a robust process to obtain placental T naive/scm population as source materials to produce off-the-shelf, highly scalable CyCART-19 cells
- CyCART-19 demonstrates stem cell memory characteristics as evidenced by greater in vivo persistence and durable antitumor activity in preclinical models
- Strong pre-clinical evidence of anti-tumor activity
  - CyCART-19 cells outperform adult blood-derived CART cells by significantly greater persistence and longer survival in preclinical studies
- Early data suggesting no signs of GvHD
- Note: If Phase 1 successful, Celularity plans to pursue a Phase 2 basket trial across major B-cell malignancies (subject to FDA discussions)

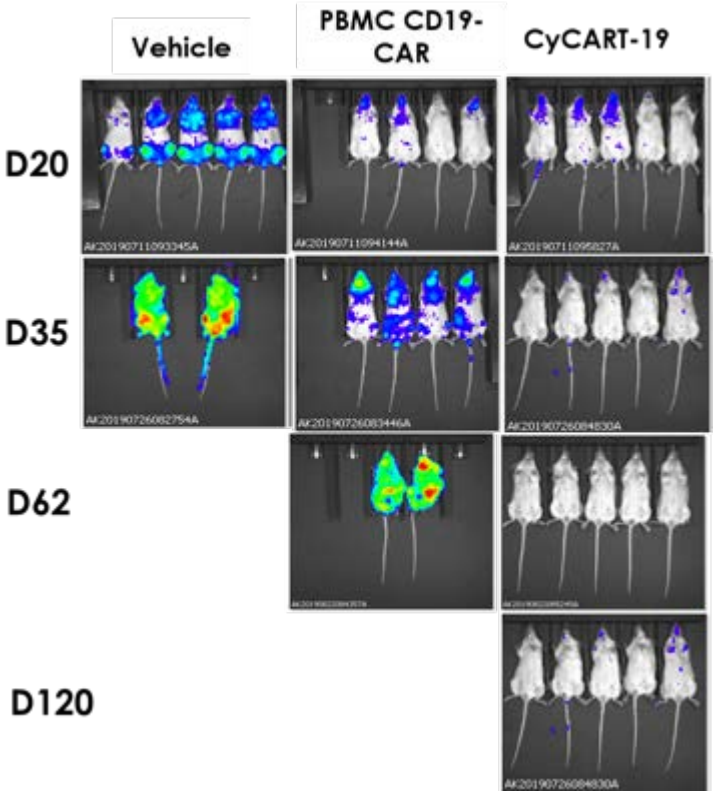
CLINICAL PLAN

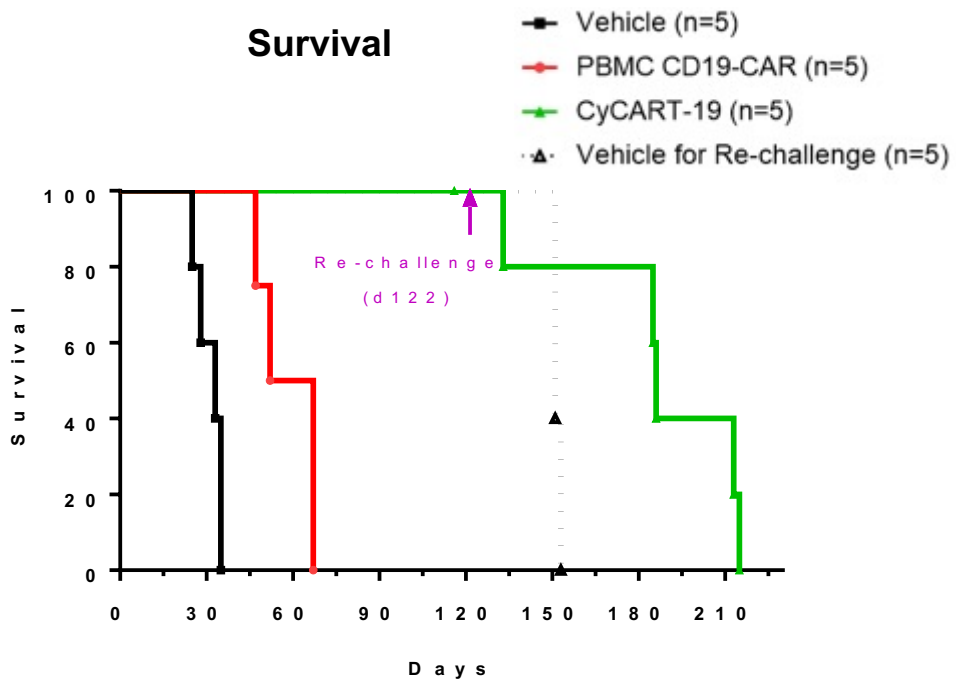
- 2H21: IND Submission Expected
- 1H22: Phase I Study Start
- 2H22: Phase II Study Start

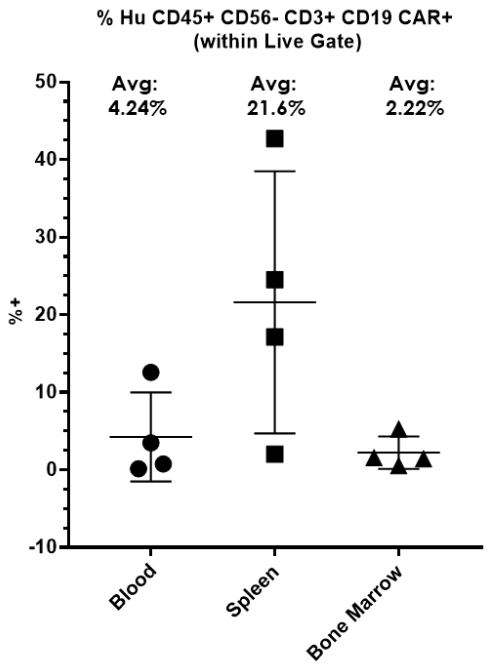
		CAR-T THERAPIES		
	Cell Therapy Technology Scorecard	**AUTOLOGOUS**	**OTHER ALLOGENEIC**	**CELULARITY CyCART-19**
MANUFACTURING COMPLEXITY	**Source Procurement** Non-invasive Collection / Reliable Procurement	✗	✗	✓
	Lower COGs Standardized, Scalable Manufacturing	✗	✓	✓
	Starting Material Consistent Quality and Phenotype	✗	✗	✓+
	Ability to Readily Expand While Maintaining a Less Differentiated Phenotype	✗	✗	✓
	"Off-the-Shelf" Treatment	✗	✓	✓+
	Ability to Re-dose Patients (if Necessary)	✗	✓	✓+

CyCART-19 DEMONSTRATES GREATER ANTI-LYMPHOMA ACTIVITIES & SURVIVAL

Enhanced Efficacy & Persistence, Prolonged Immune Attack upon Tumor Recharging







- CyCART-19 demonstrates **significantly reduced tumor burden and survival benefit** compared to adult blood-derived CD19 CAR-T cells
- CyCART-19 **eliminated tumor** and resulted in **100% survival** out to **120 days**
- CyCART-19 "**memory" characteristics demonstrated** via:
  - **Extended survival out to 215 days** upon tumor re-challenge on Day 122
  - **Differentiated persistence** at end of study to elicit **prolonged antitumor** activities

Source: Celularity Data

The CAR T Solid Tumour Challenge & Imugene's Solution

Chimeric Antigen Receptor (CAR) T cell therapy has had limited activity in solid tumours, largely due to a lack of selectively and highly expressed surface antigens, such as the blood B cell antigen CD19.

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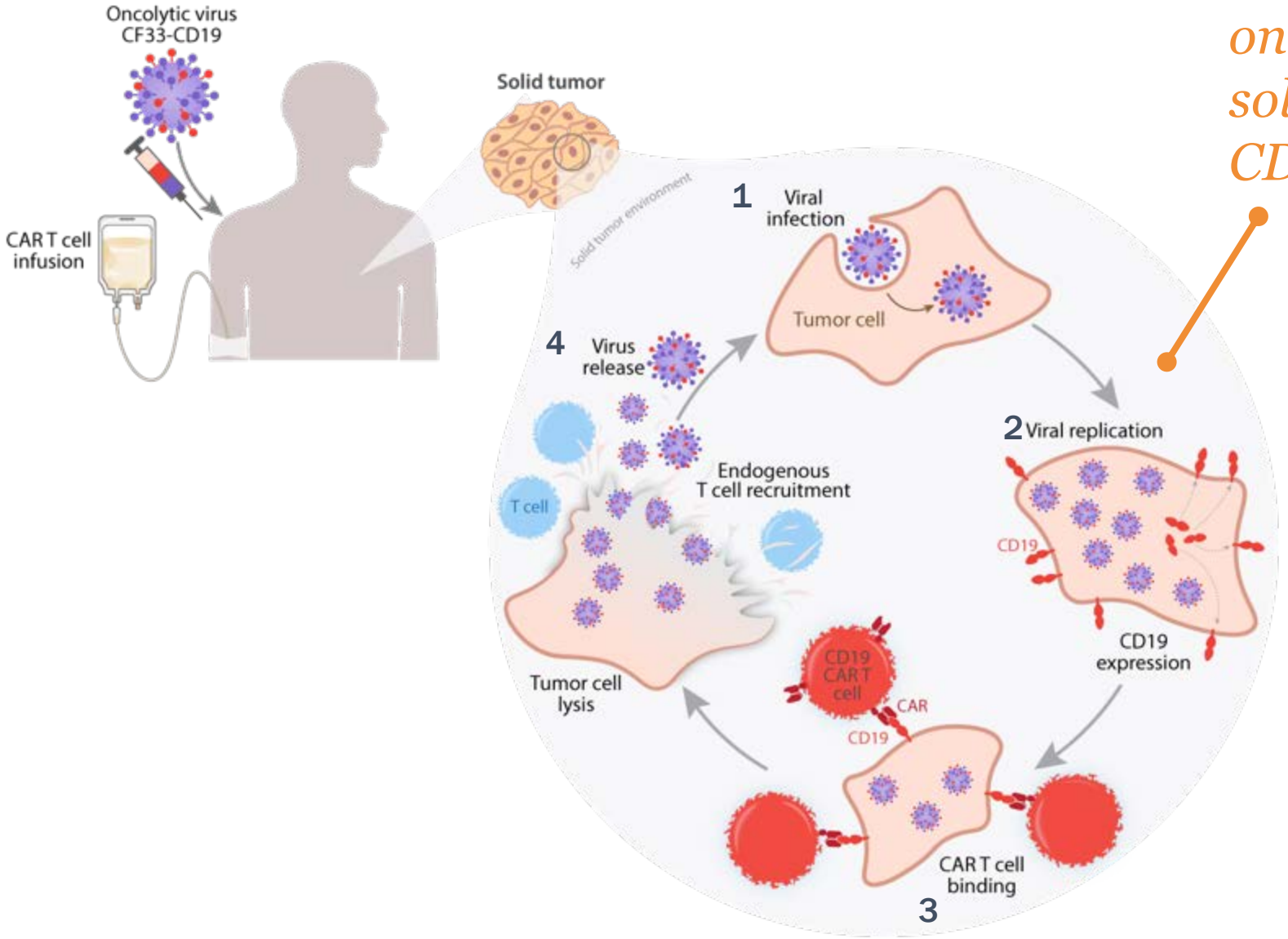
NEW CONCEPT

Utilise OV's as a delivery vector to deliver CD19 antigen to solid tumour cells

Engineer Imugene's CF33 to infect solid tumour cells and insert CD19 transgene to enable presentation of CD19 over the tumour cells during tumour cell infection, onCARlytics (CF33-CD19)

Combination use of autologous or allogeneic CD19 CAR Ts with onCARlytics (CF33-CD19) presents CD19 targets on solid tumours

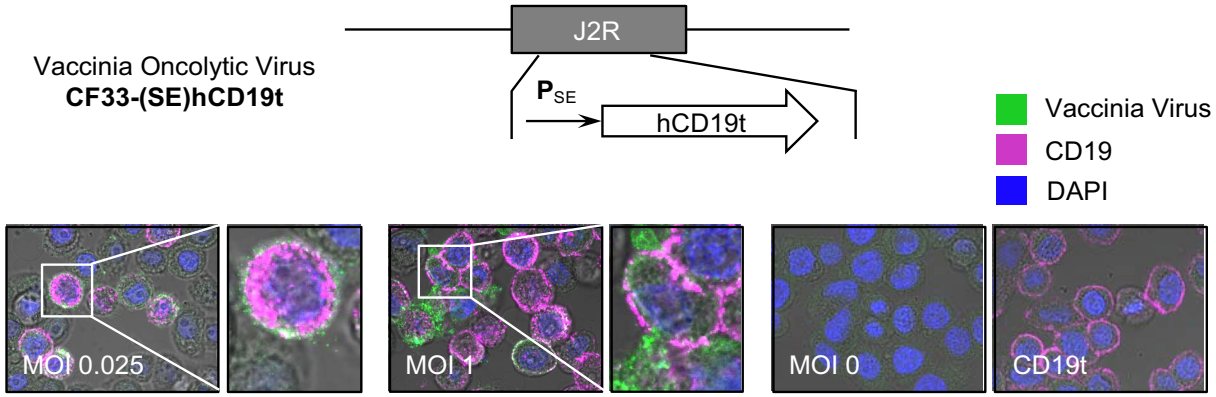
Mechanism of Action: How does it work?



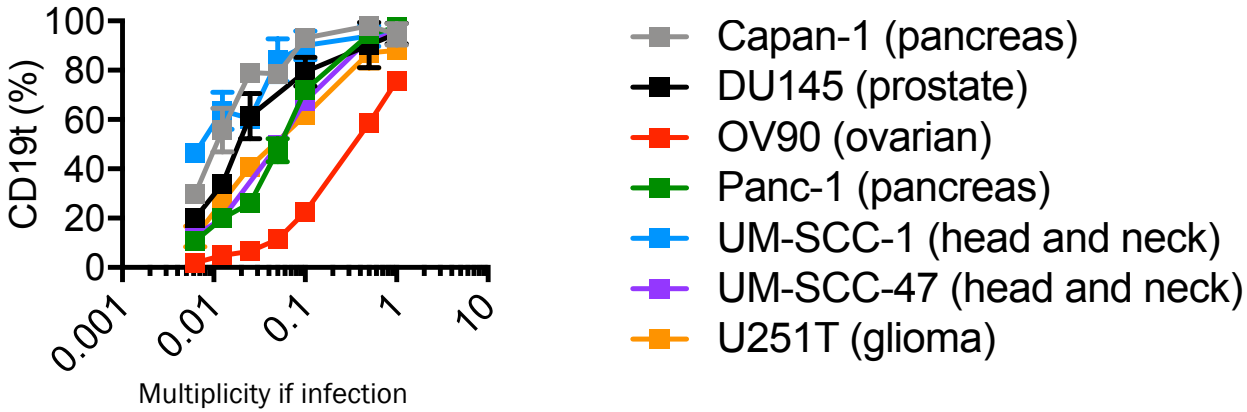
onCARlytics makes solid tumours "seen" by CD19 directed CAR T

1. OnCARlytics infects tumour cells
2. Virus replication and production of CF33-CD19 on the cell surface enabling CD19 CAR T cell targeting
3. Tumour cell lysis leads to viral particle release and the combination promotes endogenous immune cell recruitment to tumours
4. Released viral particles re-initiate virus infection of surrounding tumour cells.

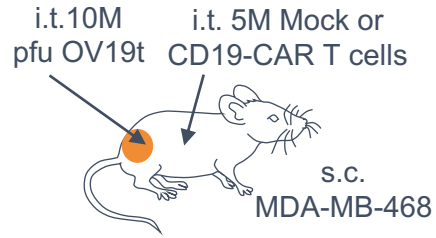
onCARIytics delivers CAR Targets to "*targetless*" solid tumours

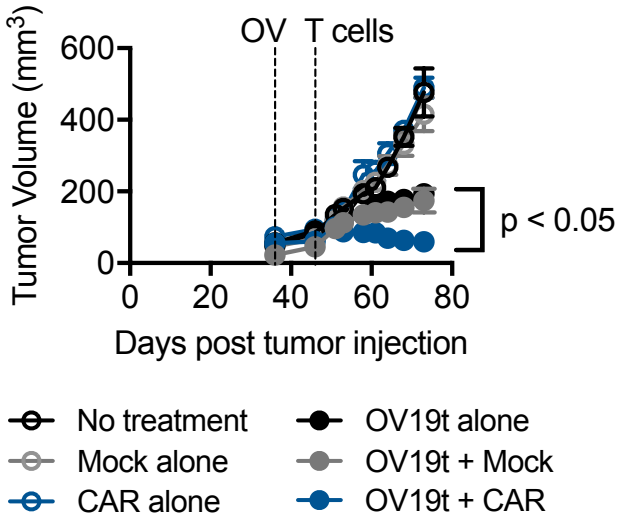


onCARIytics (CF33-CD19) infects a wide array of solid tumour cell lines, with dose-dependent CD19 cell surface expression



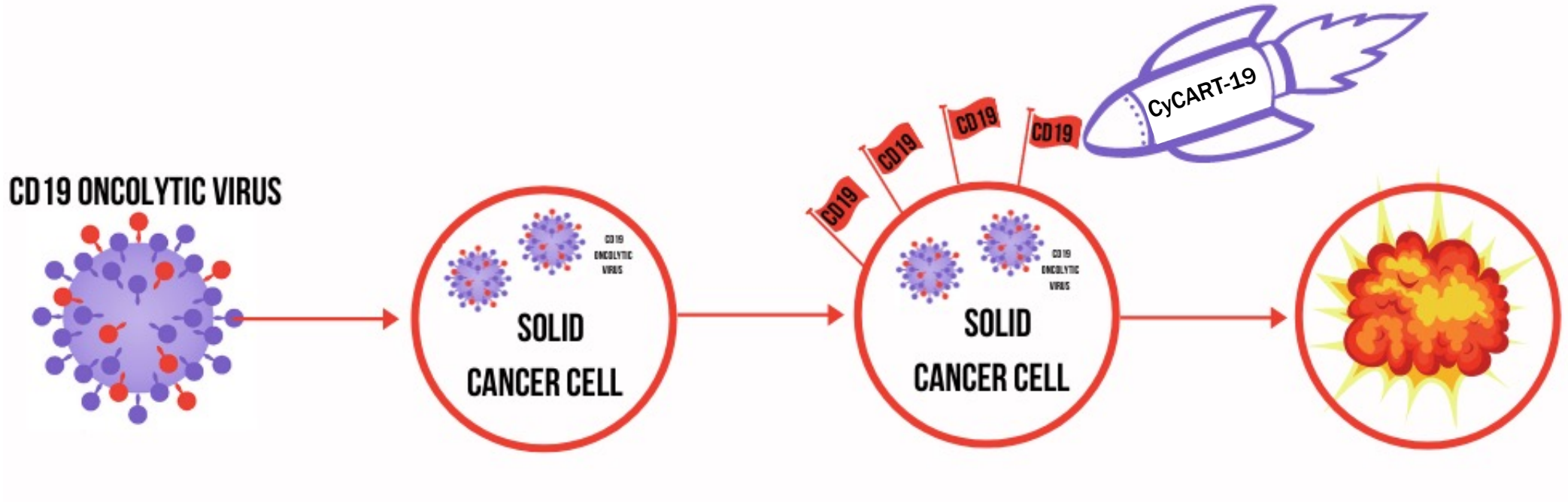
Combination of onCARIytics (CF33-CD19) and CD19-CAR T cells promotes tumour regression in xenograft model of TNBC





Park et al. *Science Translational Medicine* 2020

onCARIytics and CyCART-19 - a perfect match!



1. CD19 ONCOLYTIC VIRUS INFECTS SOLID CANCER CELLS

2. CD19 ONCOLYTIC VIRUS CAUSES THE SOLID CANCER CELLS TO GROW "CD19 FLAGS"

3. CyCART-19 CELLS RECOGNISE THE "CD19 FLAGS" AND ATTACK THE CANCER CELL

4. CANCER CELLS DIE

Milestones

	Technology	Milestone
	onCARlytics	1st Patient Dosed Monotherapy
	onCARlytics	FDA IND Clearance
	PD1-Vaxx	Combination RP2D
	onCARlytics	GLP Toxicology Study
	VAXINIA	1st Patient Dosed
	PD1-Vaxx	Expansion combination study FPI
	HER-Vaxx	Phase 2 Final Analysis
	VAXINIA	FDA IND Clearance
	onCARlytics	FDA Pre-IND Meeting
	PD1-Vaxx	Maximum Feasible Dose Identified
	HER-Vaxx	OS Endpoint Met
	onCARlytics	GMP manufacturing for pre-clinical toxicology & Phase 1 study
	CHECKvacc	TNBC IST 1st Patient Dosed
✓	onCARlytics	Strategic partnership with Celularity on CD19 CART
✓	CHECKvacc	FDA IND Clearance

Next 12-24 months

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