



IMUGENE

Developing Cancer Immunotherapies

ASX: IMU

Developing Cancer Immunotherapies

**NWR Healthcare Conference
March 22, 2023**



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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)



THREE UNIQUE TECHNOLOGY PLATFORMS MAXIMIZE OPPORTUNITIES IN SOLID TUMORS

Therapeutic approaches with combination potential with existing standards of care

PLATFORM

IP

CLINICAL TRIALS

IMUGENE
Developing Cancer Immunotherapies

onCARlytics
IMUGENE

CF33-CD19 CAR T Combination Therapy

IP TO 2038
Filed in major territories

TBC Phase 1

CF33 Oncolytic Virus
IMUGENE

CHECKvacc

VAXINIA

IP TO 2037
Filed in major territories
Granted in Japan/Mexico

COH TNBC IST
Phase 1

MAST
Phase 1

DOMINICA
Phase 1

B Cell Immunotherapy
IMUGENE

HER-Vaxx

PD1-Vaxx

IP TO 2036
Granted in multiple territories
(US/EU/Asia)

IP TO 2037
Filed in major territories
Allowed in US

HERIZON
Phase 1b/2

IMPRINTER
Phase 1

nextHERIZON
Phase 2

neoHERIZON
Phase 2

TIGIT-Vaxx, PDL1-Vaxx, LAG3-Vaxx,
TIM3-Vaxx, CTLA4-Vaxx, Claudin18.2-Vaxx

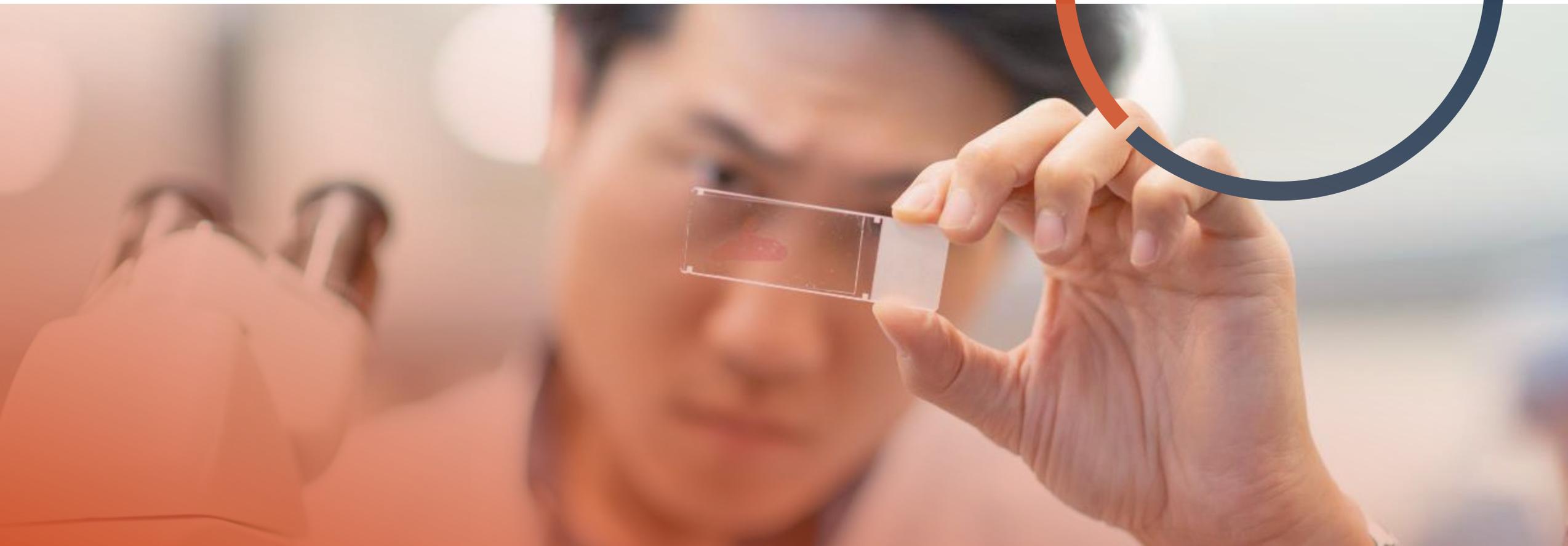
IMUGENE'S DEEP IMMUNOTHERAPY PIPELINE FOR THE TREATMENT OF SOLID TUMORS



PLATFORM	PROGRAM/TARGET	COMBINATION APPROACH	INDICATION	FDA IND	PRECLINICAL	IND	PHASE 1	PHASE 2	2023 EXPECTED MILESTONES
	onCARlytics (CF33-CD19)	CD19 targeted therapies	Metastatic Solid Tumors		PHASE 1				FDA IND
		VAXINIA (CF33)	Pembrolizumab	Metastatic Solid Tumors	✓	MAST			IV Cohort 2 Cleared Optimal Biological Dose Combination FPI IT and IV Combination OBD IV
		CHECKvacc (CF33-αPD-L1)	Checkpoint Inhibitors	Metastatic TNBC	✓	CHECKvacc IST			IT Cohort 3 Cleared Optimal Biological Dose
		CHECKvacc (CF33-αPD-L1)	Checkpoint Inhibitors	Solid Tumors		DOMINICA			FDA IND
	HER-Vaxx (HER2)	Chemotherapy	First Line Gastric Cancer		HERIZON			Publication and Presentation (ASCO GI)	
			Neoadjuvant Gastric Cancer		neoHERIZON			CTA Clearance FPI	
		Metastatic Gastric Cancer	✓	nextHERIZON			ASCO GI TiP Interim Data Readout		
	PD1-Vaxx (PD1)	Chemotherapy Atezolizumab	Metastatic NSCLC	✓	IMPRINTER			Combination FPI	
			MSI High CRC		NeoPolem IST			CTA Clearance FPI	

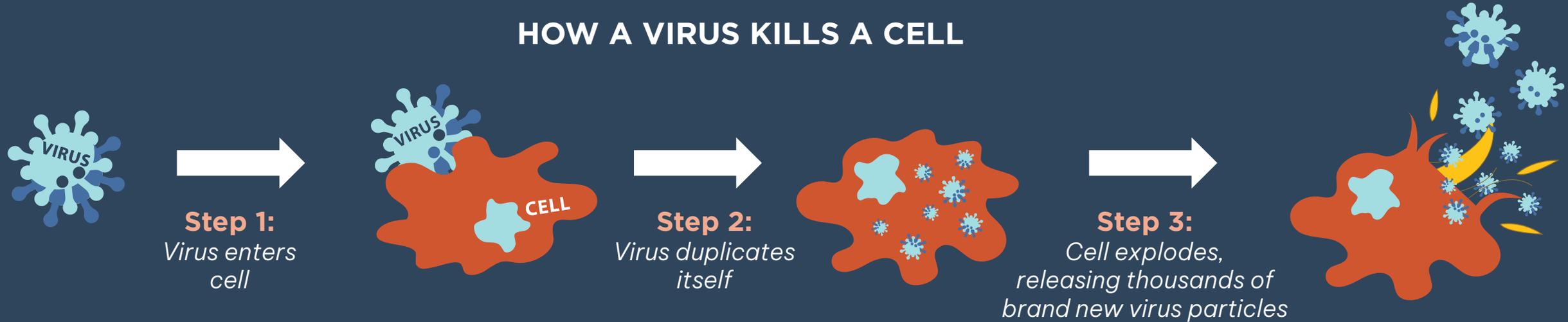


CF33 Oncolytic Virus



ONCOLYTIC VIRUSES OFFER A SELECTIVE IMMUNOGENIC APPROACH TO EFFECTIVELY KILL TUMOR CELLS

HOW A VIRUS KILLS A CELL



Engineering enhancements

- Infect and kill only cancer cells
- Carry additional payloads to augment killing (check point inhibitors, cytokines, anti-angiogenics)

Multiple ways to kill cancer cells

- Direct Lysis
- Immuno-activation
- Priming of TME to enhance checkpoint inhibitor response¹

Precedent for approval

- Tvec approved in the United States for melanoma (2015)
- Oncorine approved in China for head and neck cancer (2005)
- Delytact approved in Japan for malignant glioma (2021) 7

CF33-hNIS: TUMOR TRACKING AND TROPISM

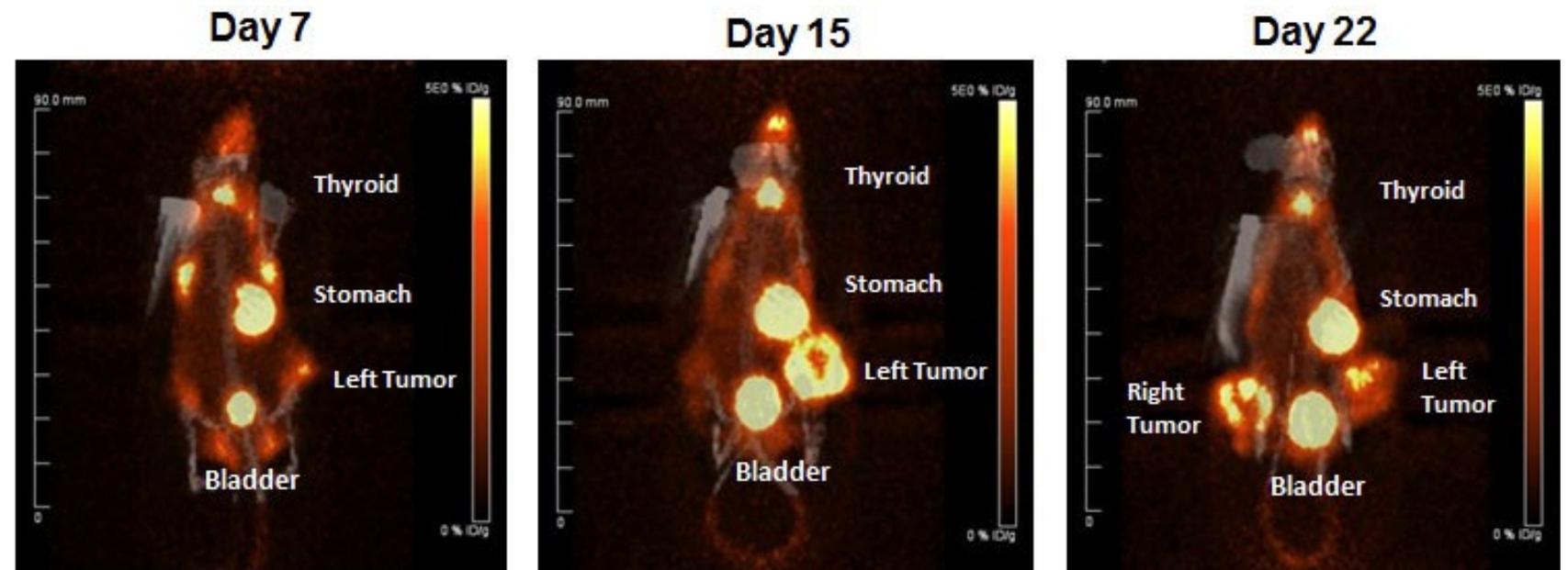
Genetic modification enables tumor tracking and tumor tropism

- hNIS (human sodium iodide symporter) protein is expressed on the tumor cell surface
- hNIS transgene inserted within J2R locus (Tk) to transport radioactive iodine for imaging

^{124}I PET Imaging of CF33-hNIS-infected HCT116 (colon cancer) from flank xenografts in nude mice over time

Tracked virus supports tumor specificity and systemic delivery

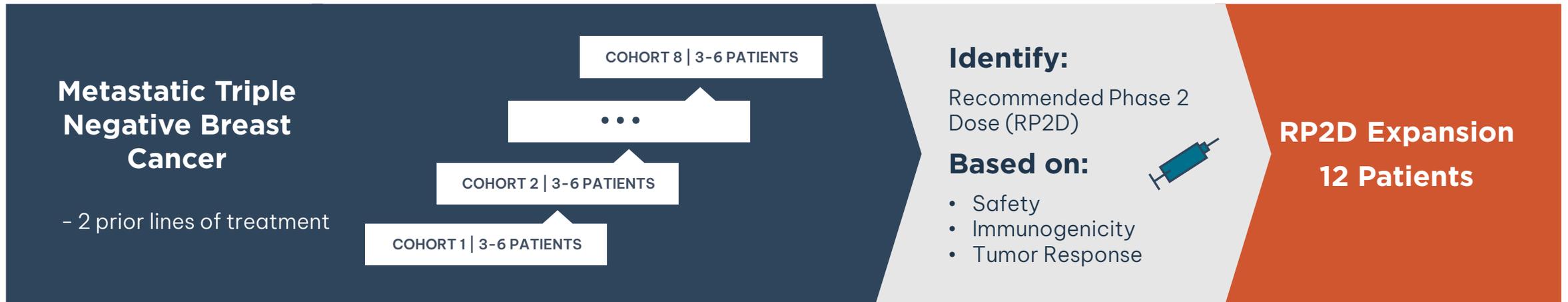
- Cross infection of tumors supported by ^{124}I uptake in right side on day 22 following injection on left side
- Physiologic uptake in thyroid, stomach and bladder



CHECKvacc PHASE 1 TNBC STUDY CF33+hNIS+aPD-L1 (“Armed” Virus)



Presented at SABC 2022



First Patient Enrolled October 2021

Disease of need

- 8-13 month survival for metastatic disease with few treatments

Potential target for immunotherapy

- Expresses PD1, PD-L1

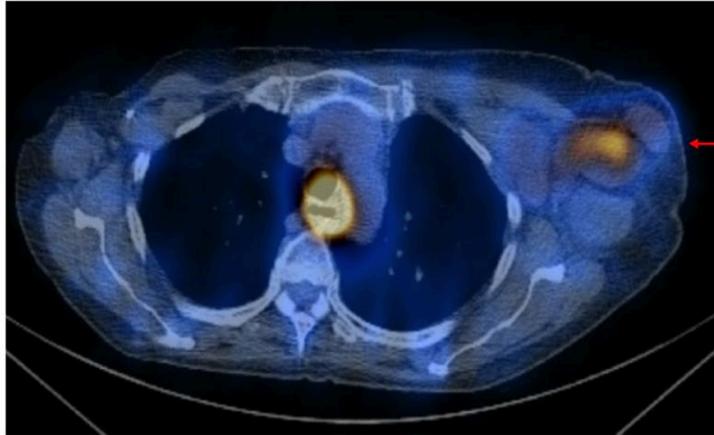
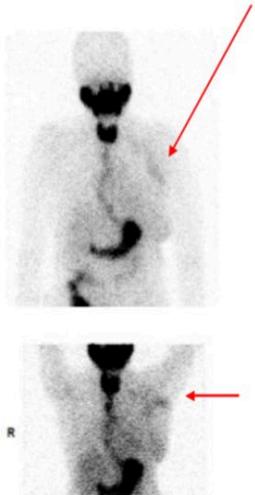
Treatment responses to Atezolizumab (JAMA Oncology, 5:74, 2019)

- 1st line: 24%; 2nd line: 6%
- Approved by FDA 8 March 2019

Potential for registration in well-designed, randomized P2 study

Indication	TNBC
FDA IND	CHECKvacc: CF33-hNIS-aPDL1
N	33-78
Location	Single Center: COH
Admin Route	Intratumoral (IT)

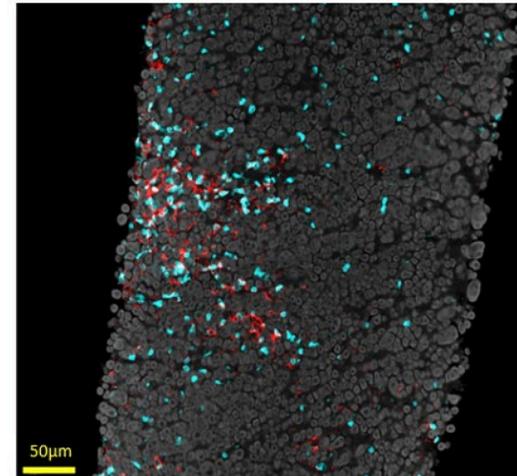
CHECKvacc (CF33-hNIS-antiPD-L1) TUMOR TRACKING



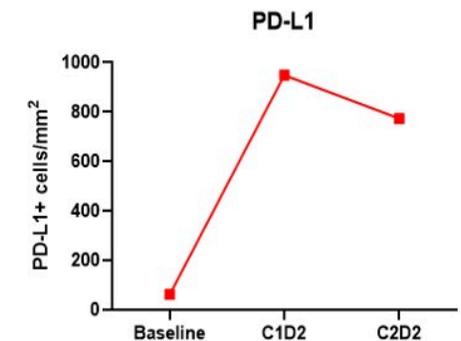
- hNIS 99m uptake in SPECT scan



C C2D2



- D
- Immune activation-increase in PD-L1



SPECT imaging of patient using Technetium-99m (C1D8): Patient COH-004 received CHECKvacc at Dose Level 2 (3×10^5 PFU). Injected lesion was left axilla showed significant enhancement of injected lymph node.

Multiplex immunofluorescence (mIF) of COH-004 tumor: C&D immune infiltrates shows increase density of PD-L1+ cells across patient tissue biopsies.

VAXINIA PHASE 1 MAST STUDY

(Metastatic Advanced Solid Tumors)

First Patient Enrolled for IT and IV combination in March, 2023

Dose Administration (Parallel Groups)

n=52-100



IT Administration

Metastatic and Advanced Solid Tumors



IV Administration

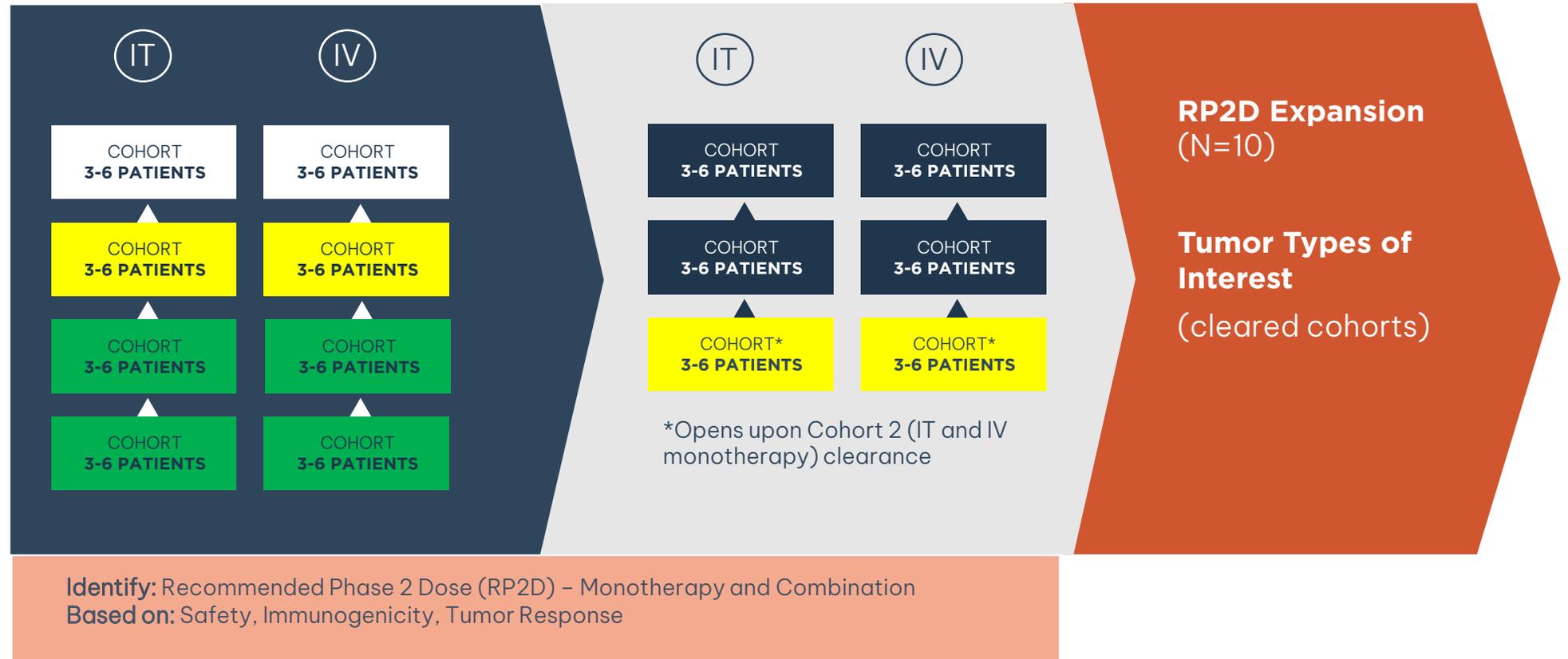
Metastatic and Advanced Solid Tumors

Site Location: USA, AUS

VAXINIA Monotherapy Dose Escalation

VAXINIA + Pembrolizumab Combination Dose Escalation*

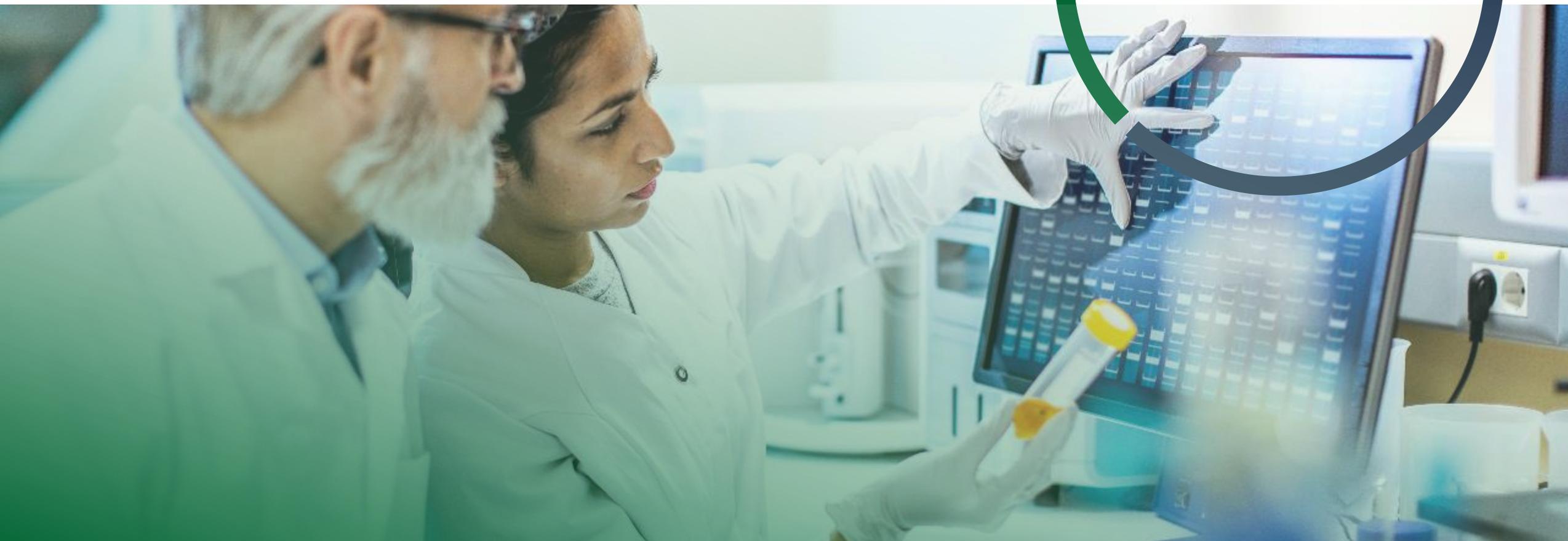
Cohort Expansion



CF33 oncolytic virus alone and in combination with pembrolizumab



CF33-CD19



THE CELL THERAPY SOLID TUMOR CHALLENGE & IMUGENE'S SOLUTION

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

CD19 Targeting domain

CD19 Targeting Cells

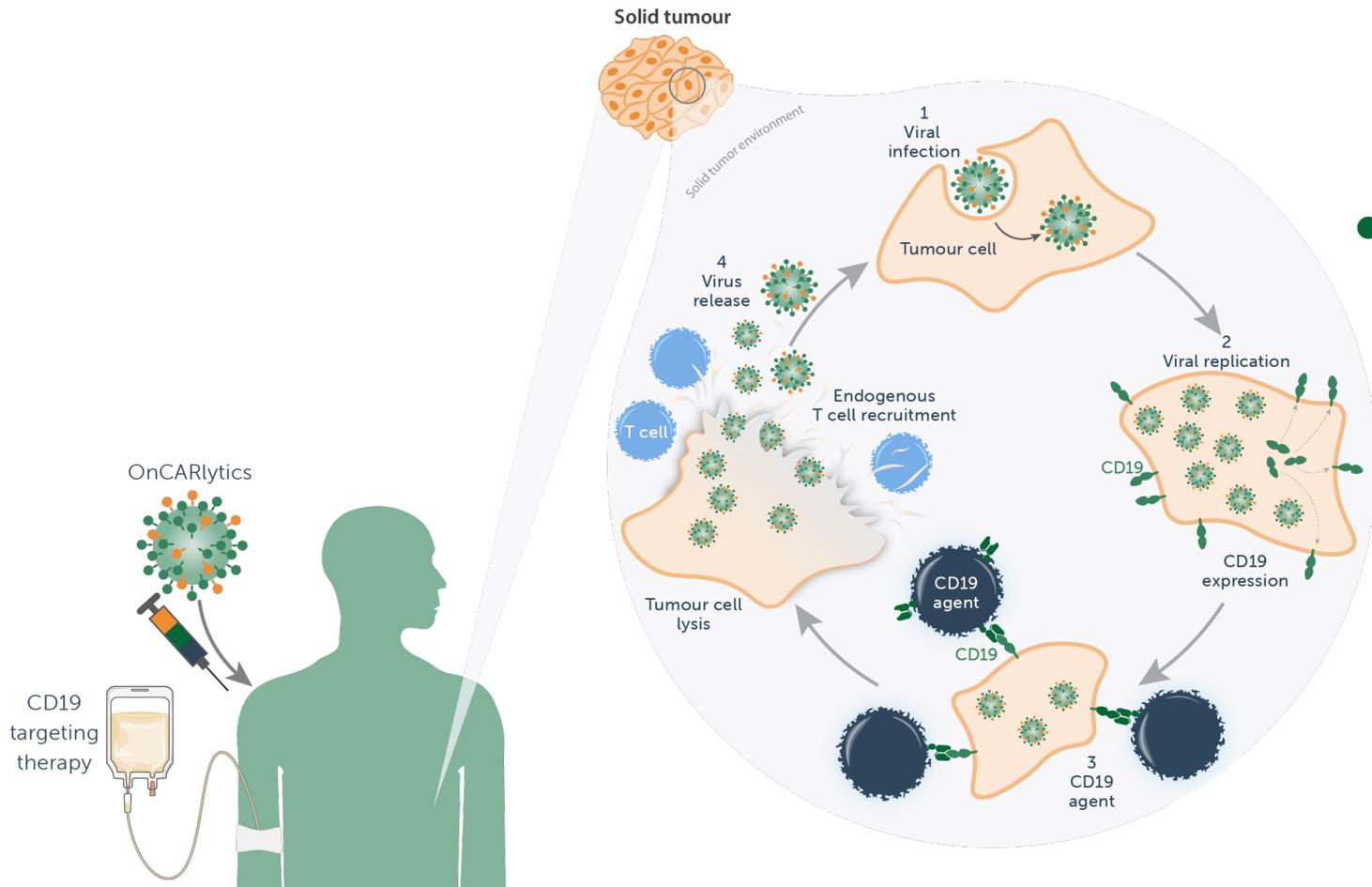
OV generated CD19

Solid Tumor

IMUGENE'S APPROACH

- Use onCARlytics (CF33-CD19) to express CD19 antigen on solid tumor cells
- Combine onCARlytics (CF33-CD19) with autologous or allogeneic CD19 CAR T cell therapies for the treatment of solid tumors

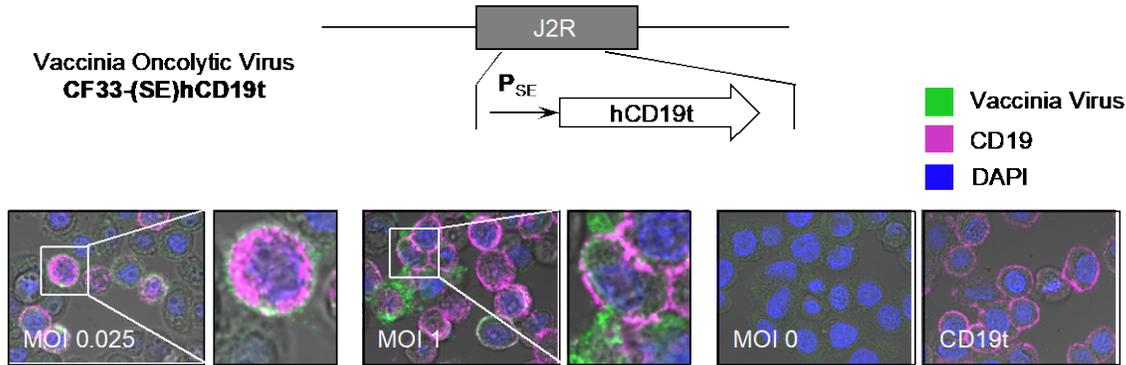
MECHANISM OF ACTION: HOW DOES IT WORK?



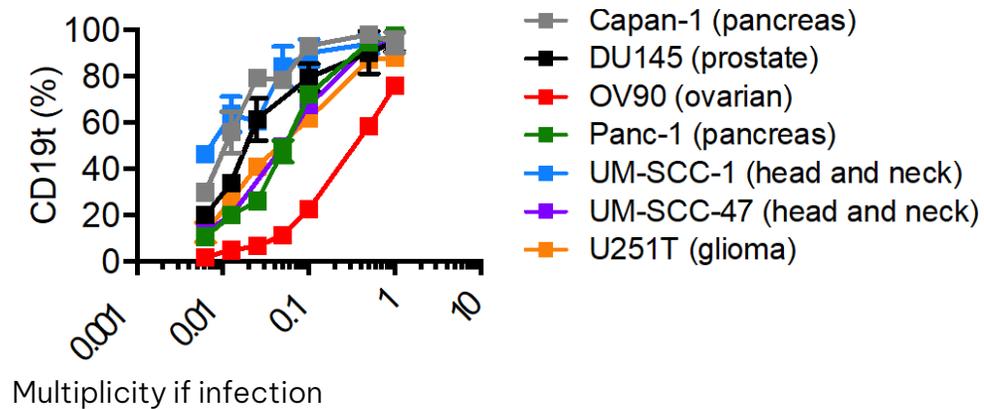
onCARlytics makes solid tumors “seen” by CD19 targeting therapies

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

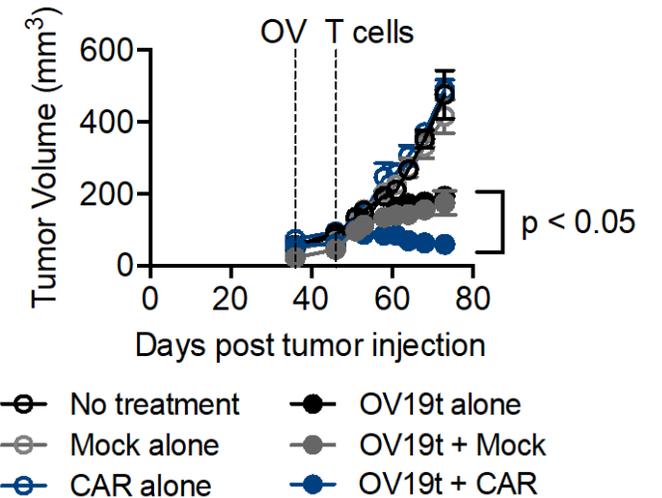
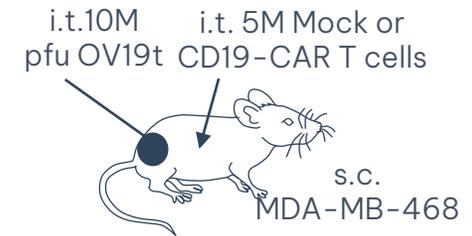
onCARLYTICS DELIVERS TARGETS TO “TARGETLESS” SOLID TUMORS



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



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

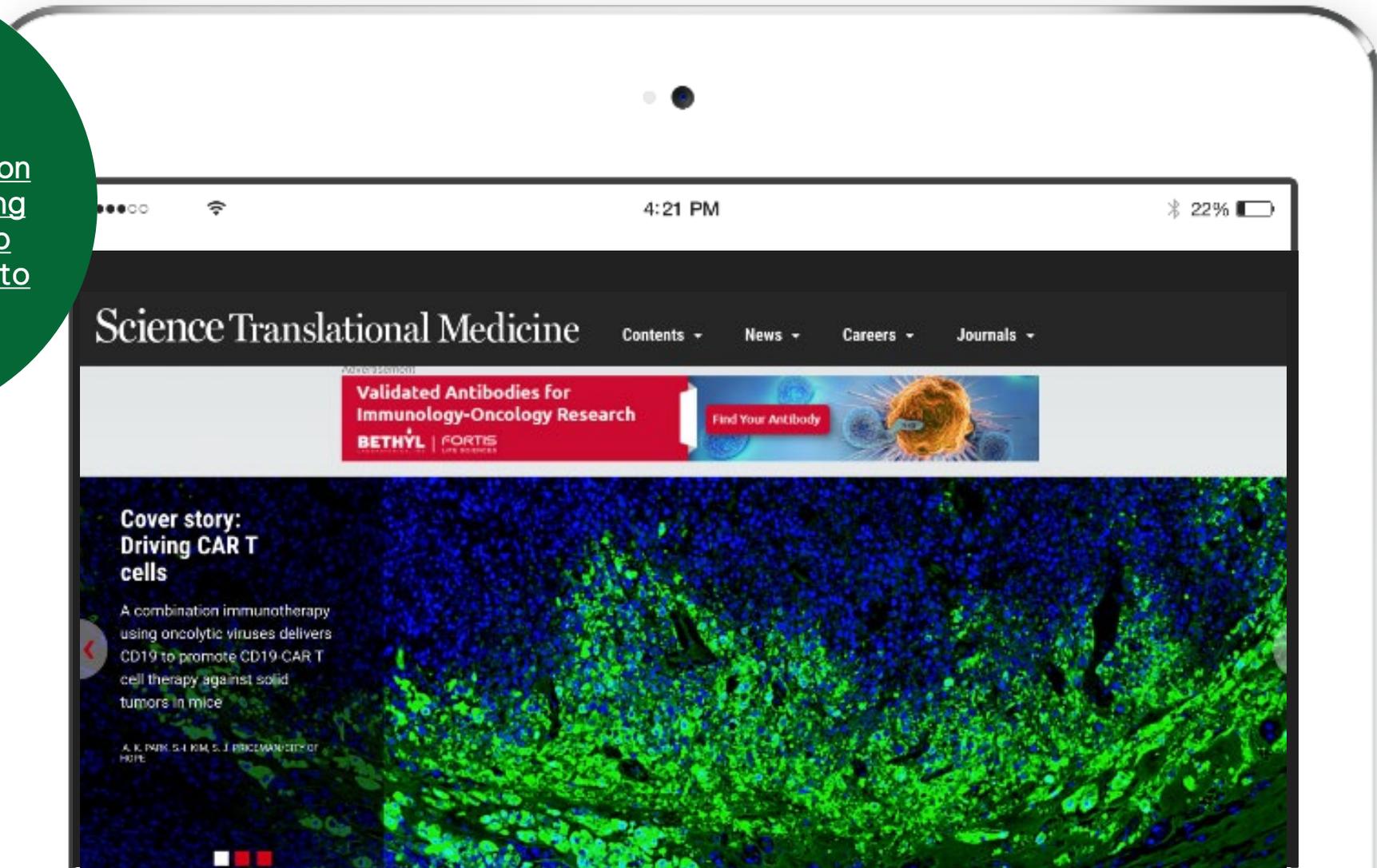


PUBLISHED FRONT COVER OF SCIENCE TRANSLATIONAL MEDICINE JOURNAL IN 2020



Effective combination immunotherapy using oncolytic viruses to deliver CAR targets to solid tumors

Park AK, Fong Y, Kim SI, Yang J, Murad JP, Lu J, Jeang B, Chang WC, Chen NG, Thomas SH, Forman SJ, Priceman SJ. *Sci Transl Med.* 2020 Sep 2;12(559): eaaz1863. doi: 10.1126/scitranslmed.aaz1863. PMID: 32878978



onCARLYTICS COMBINATION WITH CD19 TARGETING THERAPIES



Collaboration with Celularity, Eureka and Arovella for combination with onCARlytics

AUG 2021
Strategic Partnership with Celularity



Allogeneic CyCART19® T cells

NOV 2021
Strategic Partnership with Eureka



Autologous ARTEMIS® T cells

SEP 2022
Strategic Partnership with Arovella



Allogeneic invariant natural killer (iNKT) cells



3 POSTERS PRESENTED AT SITC 2022



CD19-CR19 CAR T-CELLS IN COMBINATION WITH OFF-THE-SHELF ALLOGENEIC CYCART19 T-CELLS TARGETING DE NOVO CD19 EXPRESSING TUMORS

Anthony A. Park, Leah Worley, Colin Cook, Shuying He, Kelly Perreault, W. Scott Dunbar, Laura M. G. Cheng, Robert F. Wilshire, Robert H. Jones, and David A. Prosser



CD19-CR19 CAR T-CELLS IN COMBINATION WITH OFF-THE-SHELF ALLOGENEIC ARTEMIS T-CELLS TARGETING DE NOVO CD19 EXPRESSING TUMORS

Anthony A. Park, Leah Worley, Colin Cook, Shuying He, Kelly Perreault, W. Scott Dunbar, Laura M. G. Cheng, Robert F. Wilshire, Robert H. Jones, and David A. Prosser



COMBINATION IMMUNOTHERAPY USING A NOVEL CHIMERIC BICRYPTIC VMS (ON CARLYTIC) TO RECRUIT CD19 SPECIFIC T-CELL ENGAGERS TO TARGET SOLID TUMORS

Anthony A. Park, Leah Worley, Colin Cook, W. Scott Dunbar, Laura M. G. Cheng, Robert F. Wilshire, Stephen J. Formica, Katherine M. Heston, and David A. Prosser



B Cell Immunotherapy
IMUGENE

HER-Vaxx



B CELL BASED ANTIBODIES HAVE DISTINCT COMPETITIVE ADVANTAGES TO EXISTING TREATMENTS

B cell vaccines offer a unique opportunity to intervene at multiple points in the immune system and create immune memory which enhances durability of response.

NATURAL B CELL DERIVED ANTIBODIES

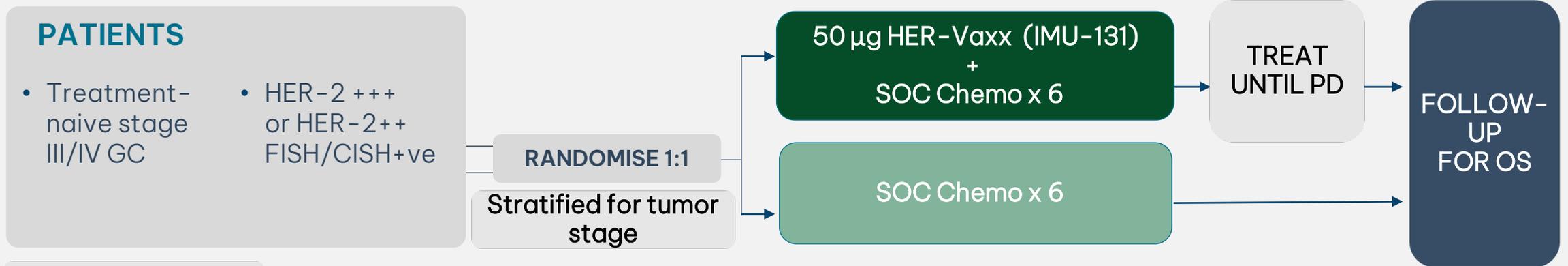


MONOCLONAL ANTIBODIES



	NATURAL B CELL DERIVED ANTIBODIES	MONOCLONAL ANTIBODIES
Safety	Stimulates the immune system to produce Abs, which may be potentially safer	Synthetic Ab, with side effects (including ventricular dysfunction, CHF, anaphylaxis, infusion reactions, immune mediation)
Efficacy	Polyclonal Ab response reduces risk of resistance and potentially increases efficacy	Monoclonal Ab – may develop anti-drug antibodies
Durability	Antibodies continuously produced with lasting immune response to potentially inhibit tumor recurrence	Half life necessitates recurrent dosing
Usability	After priming, low numbers of vaccinations required per year	Requires regular infusion
Cost	Low cost of production enables greater pricing flexibility facilitating combination	Expensive course of treatment >US\$100K per year

HERIZON PHASE 1B/2 OPEN LABEL, MULTICENTER STUDY



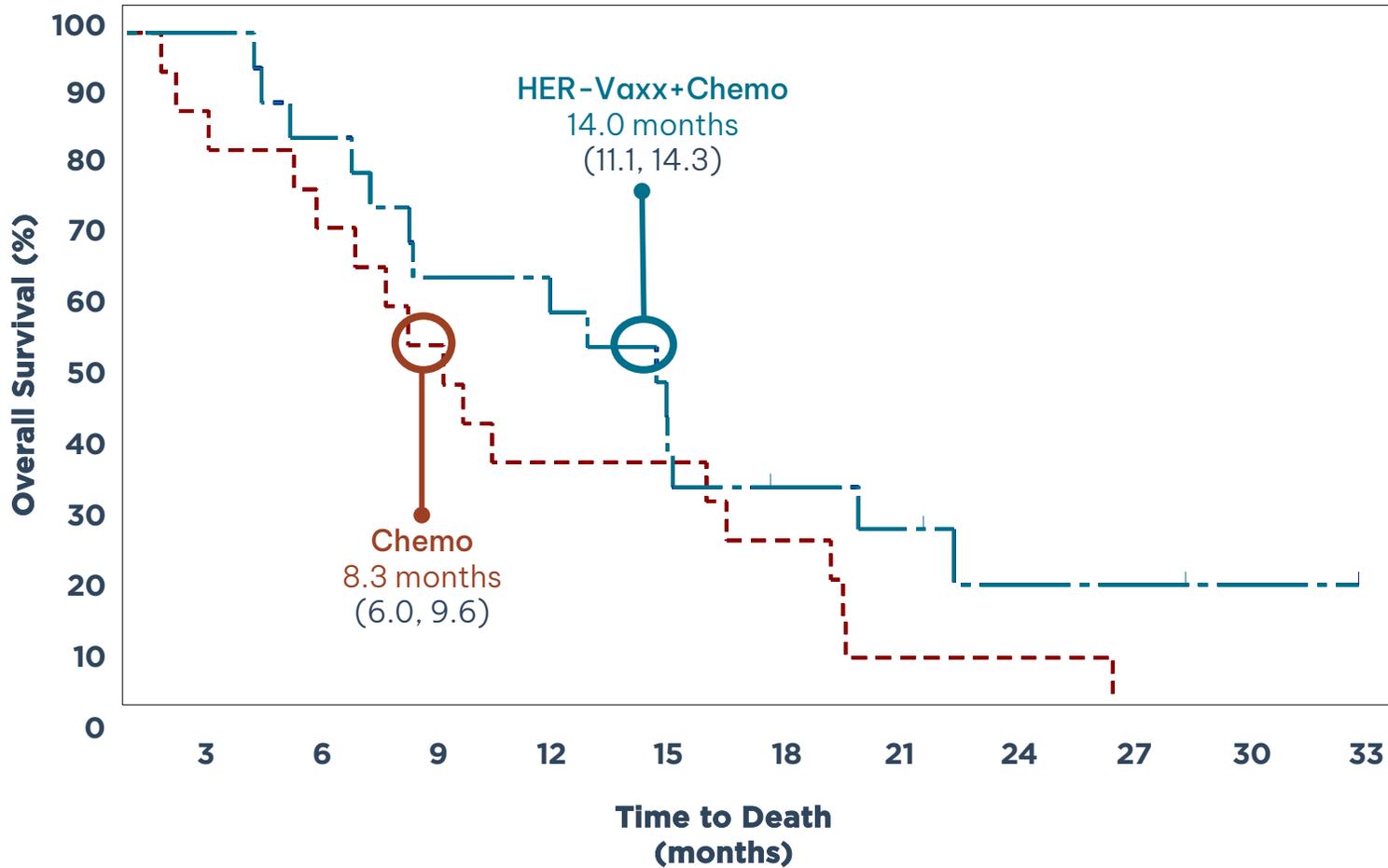
NCT02795988

First patient dosed in March 2019

HER-Vaxx	C1D1, C3D1 then Q9 weeks till PD
Chemotherapy	6 cycles Q3 weeks (Cisplatin + 5FU or Capecitabine; Oxaliplatin + Capecitabine)

PRIMARY ENDPOINT	OS (pre-spec 1-sided alpha 0.10, power 90% with critical HR 0.6 and 24 events)	NO. OF PATIENTS	36
SECONDARY ENDPOINTS	PFS, Safety, Immune Response	SITE LOCATION	Eastern Europe, India

HER-Vaxx SIGNIFICANTLY PROLONGS OVERALL SURVIVAL IN 1L PATIENTS WITH HER-2+ GASTRIC CANCER



	HER-Vaxx + Chemotherapy	Chemotherapy
Sample Size	19	17
Events	15	17
Median OS (2-sided 80% CI)	14.0 months (11.1, 14.3)	8.3 months (6.0, 9.6)
Median Duration of Response	30 weeks	19 weeks
HR	0.558	
2-sided 80%CI	(0.362, 0.927)	
Log-rank Test (1-sided p- value) *	0.054 *	

*Significant, 1-sided p < 0.10

HERIZON IN THE NEWS !



OncLive.com

@OncLive



Patients with HER2-overexpressing metastatic or advanced gastric/GEJ adenocarcinoma treated with HER-Vaxx + standard-of-care chemotherapy had a statistically significant survival benefit compared with those who received chemotherapy alone. [#oncology](#)
ow.ly/8YhO50MAxPT pic.twitter.com/1Vhly78Ld3

26/1/2023, 2:00 pm

Cancer Therapy Advisor

Home » News » Conference Coverage » ASCO GI 2023

January 20, 2023

HER-Vaxx Improves Survival in HER2+ Advanced Gastric/GEJ Cancer

Jen Smith

ASCO Daily News

Clinical News From the American Society of Clinical Oncology

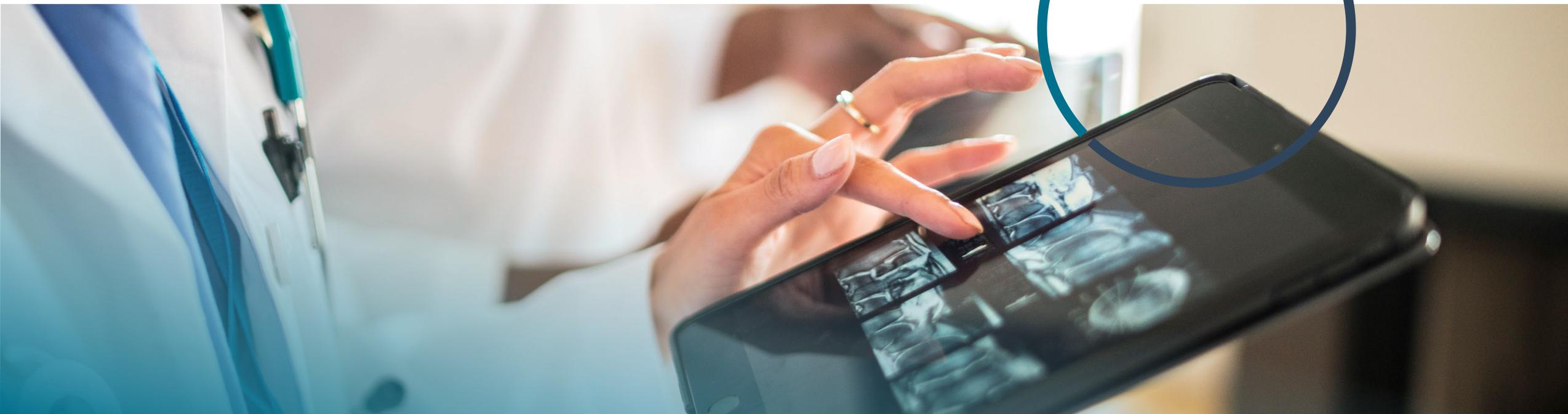
NEWS COMMENTARIES MEETINGS TOPICS PODCASTS ABOUT

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2023 ASCO GASTROINTESTINAL CANCERS SYMPOSIUM

Encouraging Results Seen With HER-Vaxx Plus Chemotherapy in Gastric/Gastroesophageal Junction Cancer

HER-Vaxx Studies



HER-Vaxx PHASE 2: nextHERIZON IN METASTATIC GASTRIC CANCER AFTER PROGRESSION ON TRASTUZUMAB



TRIAL

- Phase 2
- Open label
- USA, Australia, Asia
- Treat until progression/toxicity



PATIENTS

- > 1L
- Advanced or metastatic Gastric Cancer
- HER-2/neu overexpressing
- Progressed on prior trastuzumab



STUDY

- Non-Randomised
- HER-Vaxx in combination with paclitaxel + ramucirumab
OR
HER-Vaxx in combination with pembrolizumab



ENDPOINTS

Primary

- Objective Response Rate
- Safety

Secondary

- Overall Survival
- Progression-free survival
- Duration of Response

First Patient Enrolled Sept 2022

mGC/GEJ cancer
HER-2/neu overexpressing
Progressed on or after trastuzumab &
previously received PD-1/PD-L1 treatment

Arm 1: HER-Vaxx + SOC Chemotherapy

mGC/GEJ cancer
HER-2/neu overexpressing
Progressed on or after trastuzumab

Arm 2: HER-Vaxx + pembrolizumab

PRIMARY ENDPOINTS:
ORR
Safety

SECONDARY ENDPOINTS:
OS
PFS
DoR

EXPLORATORY ENDPOINT:
Biomarker/Immune Response

HER-Vaxx PHASE 2: neoHERIZON IN RESECTABLE GASTRIC CANCER



TRIAL



PATIENTS



STUDY



ENDPOINTS

- Phase 2
- Open label
- Randomised
- Germany

- Neoadjuvant Gastric Cancer
- HER-2+++ / HER-2++ FISH/CISH +ve

- Arm 1 – FLOT + HER-Vaxx
- Arm 2 – FLOT + Avelumab + HER-Vaxx

Primary

- Pathological Complete Response

Secondary

- Safety
- Immune Response
- Duration of Response/Overall Survival



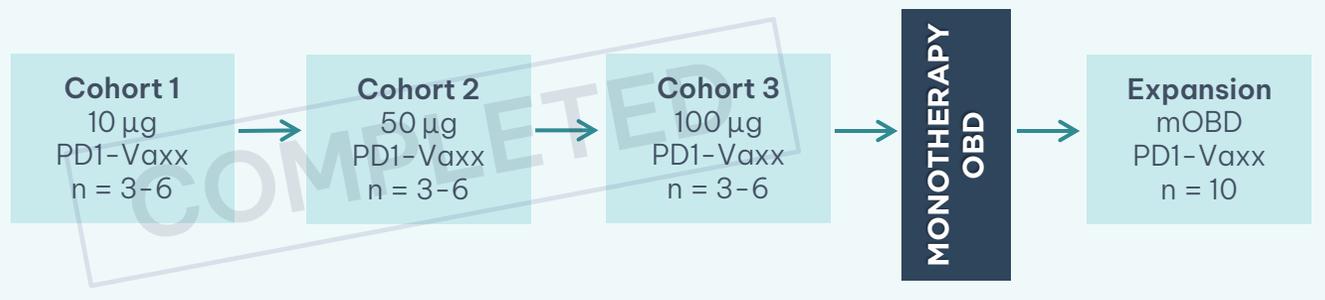


PD1-Vaxx

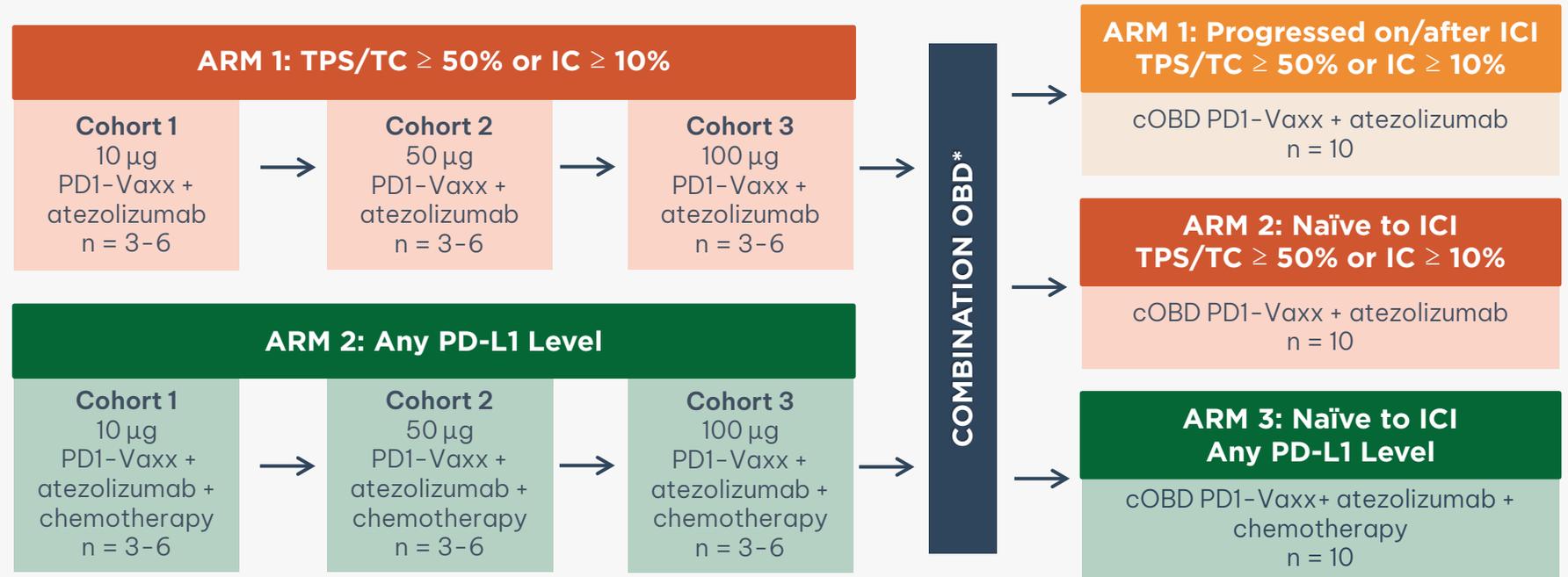


IMPRINTER: PD1-Vaxx NSCLC PHASE 1 STUDY DESIGN

Phase 1: PD1-Vaxx Monotherapy Dose Escalation & Expansion 2L+ NSCLC Progressed on/after ICI



Phase 1b: PD1-Vaxx NSCLC Combination Dose Escalation & Expansion



mOBD = monotherapy optimal biological dose
cOBD = combination optimal biological dose
*cOBD will be determined per arm

VALUE INFLECTION POINTS EXPECTED IN THE NEXT 12 MONTHS

VAXINIA	MAST: Combination OBD IV
onCARlytics	FPI
HER - Vaxx	neoHERIZON: FPI
HER - Vaxx	nextHERIZON: Interim Data Readout
VAXINIA	MAST: Optimal Biological Dose (Mono IV and/or IT)
HER - Vaxx	neoHERIZON: CTA Clearance
CHECKvacc	DOMINICA: FDA IND
PD1 - Vaxx	neoPOLEM(CRC IST)
CHECKvacc	COHIST: Optimal Biological Dose
PD1 - Vaxx	IMPRINTER: Combination FPI
onCARlytics	FDA IND

RECENTLY ACHIEVED

✓	VAXINIA	MAST: Combination FPI IT and IV
✓	VAXINIA	MAST: IV Cohort 2 Cleared
✓	HER - Vaxx	HERIZON: Publication and Presentation (ASCO GI)
✓	HER - Vaxx	next HERIZON: Trial in Progress Poster (ASCO GI)
✓	VAXINIA	MAST: IV Cohort 1 Cleared
✓	onCARlytics	3 Presentation at SITC
✓	VAXINIA	MAST: IV Arm - 1st Patient Dosed
✓	HER-Vaxx	nextHERIZON: Phase 2 - 1st Patient Dosed
✓	HER-Vaxx	HERIZON: Phase 2 - Final OS readout

FINANCIAL SUMMARY

PUBLIC MARKET OVERVIEW (March 21, 2023)

Share Price	A\$0.13
52 week range	A\$0.12 - A\$0.32
Market Capitalisation ¹	A\$835M
Cash equivalents (31 December '22)	A\$162M
Enterprise Value	A\$673M

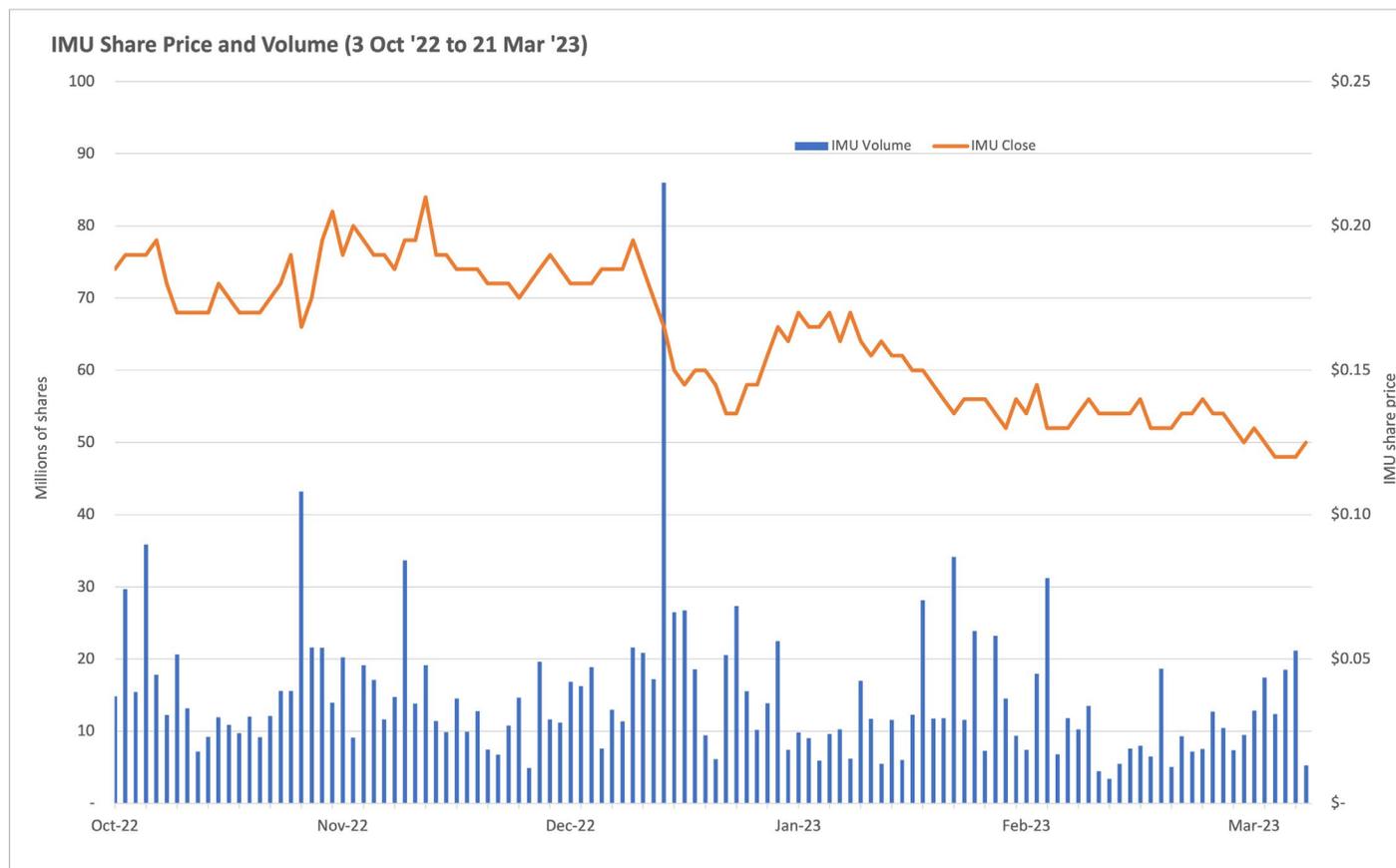
TOP 5 SHAREHOLDERS (as at March 21, 2023)

JP Morgan Nominees Australia Pty Limited	9.02%
HSBC Custody Nominees (Australia) Limited	5.51%
Paul Hopper	4.94%
Citicorp Nominees Pty Limited	4.65%
Mann Family	4.60%

Note:

1. Market capitalisation calculations based on ordinary shares (6.423 bn) only and excludes the dilutive impact of options outstanding (0.477 bn)

SHARE PRICE PERFORMANCE

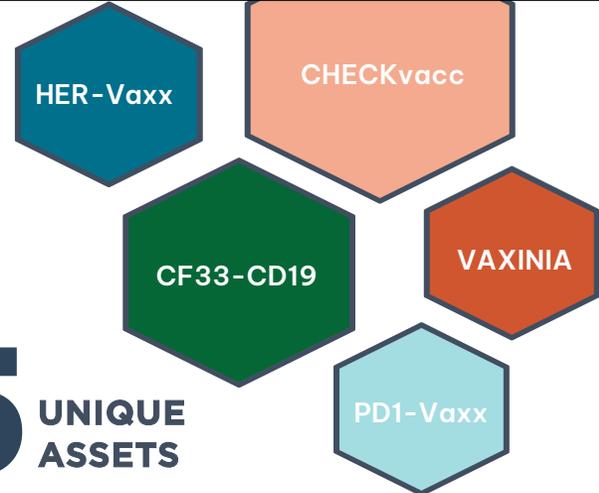


INVESTMENT HIGHLIGHTS

MARKET CAPITALISATION 21st March 2023 A\$835M 

CASH AS OF 31st December 2022 A\$162M 

5 UNIQUE ASSETS



***Multiple potential platform targets** | CF33-CD20 | LAG3-Vaxx | CTLA4-Vaxx
TIGIT-Vaxx | PDL1-Vaxx | TIM3-Vaxx

CF33 Oncolytic Virus onCARlytics B-Cell Immunotherapies

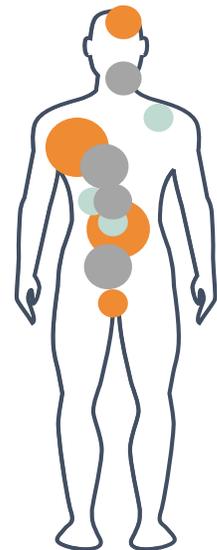
3 PLATFORM TECHNOLOGIES 

Celularity Eureka Arovella

3 SCIENTIFIC COLLABORATIONS

DISEASE AREAS

- Breast (TNBC)
- Lung (NSCLC)
- Gastric
- Gastroesophageal
- Colorectal (CRC)
- Melanoma
- Head and Neck
- Hepatocellular
- Pancreatic
- Glioblastoma (GBM)



9 CLINICAL STUDIES 

HERIZON: Ph1b/2 First line Gastric Cancer
 IMPRINTER: Ph1 NSCLC (FDA IND)
 CHECKvacc COH IST: Ph1 TNBC (FDA IND)
 neoHERIZON: Ph 2 Neoadjuvant Gastric Cancer
 nextHERIZON: Ph2 Metastatic Gastric Cancer (FDA IND)

MAST: Ph1 Solid Tumors (FDA IND)
 DOMINICA: Ph1 TNBC (FDA IND)
 onCARlytics: Ph1 Solid Tumors (FDA IND)
 neoPolem IST: Ph1 CRC

2 SUPPLY AGREEMENTS 

Merck KGaA/Pfizer Roche

Contact

shareholderenquiries@imugene.com
www.imugene.com



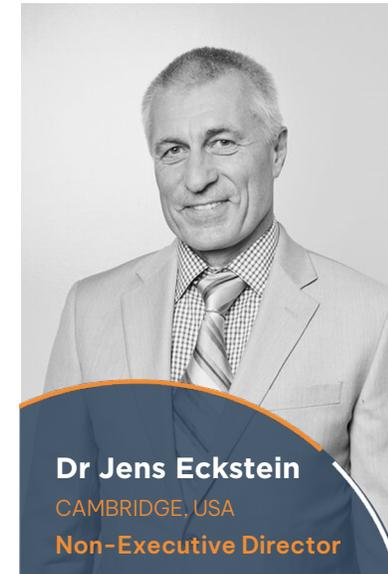
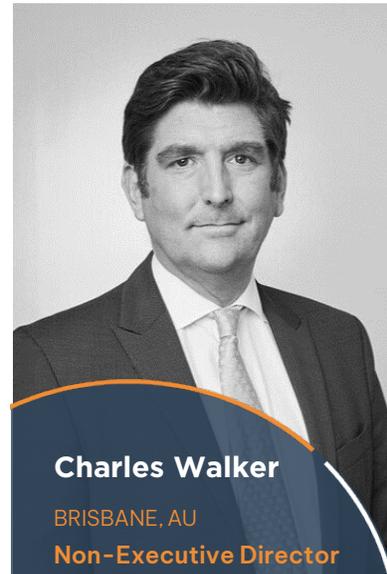
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Developing Cancer Immunotherapies



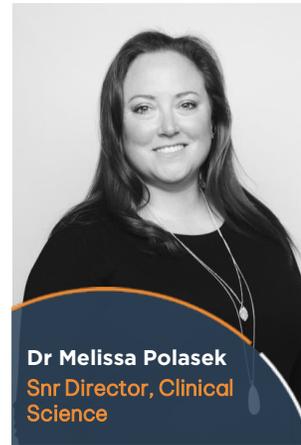
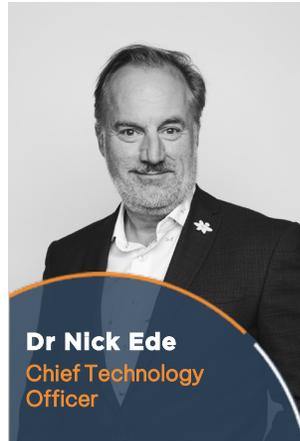
INTERNATIONAL LEADERSHIP TEAM WITH EXTENSIVE COMMERCIALISATION EXPERTISE IN THE SECTOR

Imugene has a team with oncology drug development experience



IMUGENE'S MANAGEMENT TEAM

Experienced management team with significant clinical development expertise



IMUGENE SCIENTIFIC ADVISORY BOARD



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