

# ImmVirX

Receptor Targeted Oncolytic Viruses

Bell Potter Healthcare Conference

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November 2022

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# Overview

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## AMBITION

To provide durable responses with a high quality of life in patients with some of the most globally prevalent cancer types using our proprietary bio-selected, receptor targeted, RNA oncolytic viruses

## APPROACH

- Highly inflame “cold” tumour types with current low responsiveness to immune checkpoint therapy
- Trigger both innate and adaptive immune responses
- Infiltrate tumours with immune cells at a high rate
- Activate immune stimulating genes to create synergy with immune checkpoint and CAR-T therapies
- Offer a favourable safety profile for patients
- Off the shelf therapy / no need for personalisation

# Successful Track Record in Oncolytic Immunotherapy



Dr. Malcolm McColl  
CEO and Co-Founder



Prof. Darren Shafren  
CSO and Co-Founder



Robert Vickery  
CFO



Dr. Leonard Post  
Non-Executive Director



Robert Routley  
Non-Executive Director



Dr. Jennifer Rosenthal  
Director Quality & Regulatory Affairs



## Cohesive Team Leveraging Past Success

- Leadership and scientific team comprised of ex-Vivalytics team members responsible for invention, preclinical and clinical development of CAVATAK technology through to acquisition by Merck for \$A502M
- Deep regulatory knowledge with extensive interactions with FDA
- GMP manufacturing and quality systems experience
- Global networks of clinicians and KOLs to facilitate clinical programs
- 20 strong R&D team in facility at TUNRA/University of Newcastle Hunter Medical Research Institute
- Completed Series A-1 financing raising \$25M
- \$16.3M cash at the end of October 2022 with runway to mid 2024

# Excellent Operational Team with Viralytics and Merck Experience



Bronwyn Davis  
Director  
CMC



Dr. Min Quah  
Director  
Discovery & Pre-clinical Research



Dr. Susanne Johansson  
Director  
Quality Management



Dr. Yvonne Wong  
Director  
Manufacturing Science



Dr. Roberta Karpathy  
Director  
Clinical Science



Mark Grose  
Consultant Project Manager  
Clinical Operations

## Proven OV Development Team

- Preclinical development and translation of Viralytics' CAVATAK into clinic
- Established advanced preclinical models to assess immunotherapy combinations
- Manufacture experience across AU/US/UK
- Managed multiple clinical trials across AU/US/UK sites ~ 300 CAVATAK patients
- Tech transfer to Merck from 2018 – 2019



# Oncolytic Viruses: Expanding the Reach and Impact of Immunotherapy

- Immunotherapies including checkpoint inhibitors have been transformative, but only for a subset of patients
- Despite limitations, the cancer immunotherapy market is projected to reach USD\$277B by 2030\*



**Oncolytic virus immunotherapies** are an emerging class of combination therapy agents with **big pharma interest** and the potential to **expand the reach** of immunotherapy to **indications not currently responsive** to checkpoint inhibitors

## Validating high value oncolytic virus transactions and valuations

### Amgen acquisition of Biovex

USD\$425M cash upfront, USD\$575M future milestone payments



### Merck acquisition of Viralytics

A\$502M cash upfront



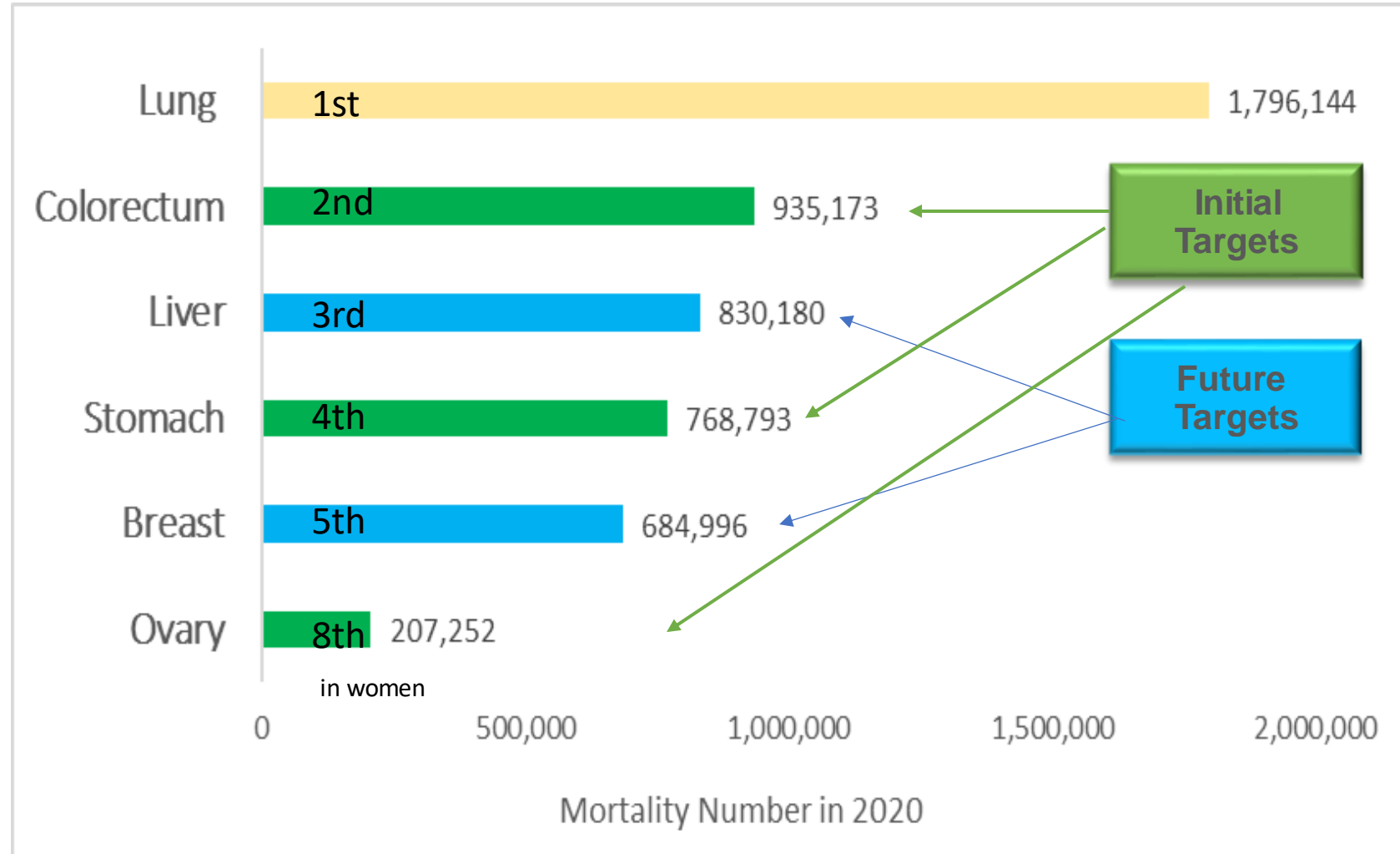
### Replimune Valuation

Market cap ~ USD\$922M (4th November 2022)



# ImmVirX Targeting Substantial Markets

Estimated number of deaths worldwide, both sexes, all ages



# High Unmet Need with Current Treatments

Indication	Forecast Deaths per Annum 2022		Clinical Response	
	USA <sup>1</sup>	China <sup>1</sup>	ICI ORR <sup>3</sup>	Study Identifier
Colorectal <sup>2</sup>	56,693	309,114	4% KEYTRUDA	KEYNOTE-028
Ovarian	14,914	39,306	9% KEYTRUDA	KEYNOTE-100
Gastric	11,898	400,415	17% KEYTRUDA	KEYNOTE-224
Breast	44,094	124,002	21% KEYTRUDA in TNBC PD-L1+	KEYNOTE-086 (cohort B)
Hepatocellular	32,332	412,216	16% KEYTRUDA	KEYNOTE-224 (cohort 2)
Melanoma (CAVATAK™ lead target indication)	7,530	4,369	33% KEYTRUDA	KEYNOTE-006

<sup>1</sup> Chinese Medical Journal 2022; 135(5)

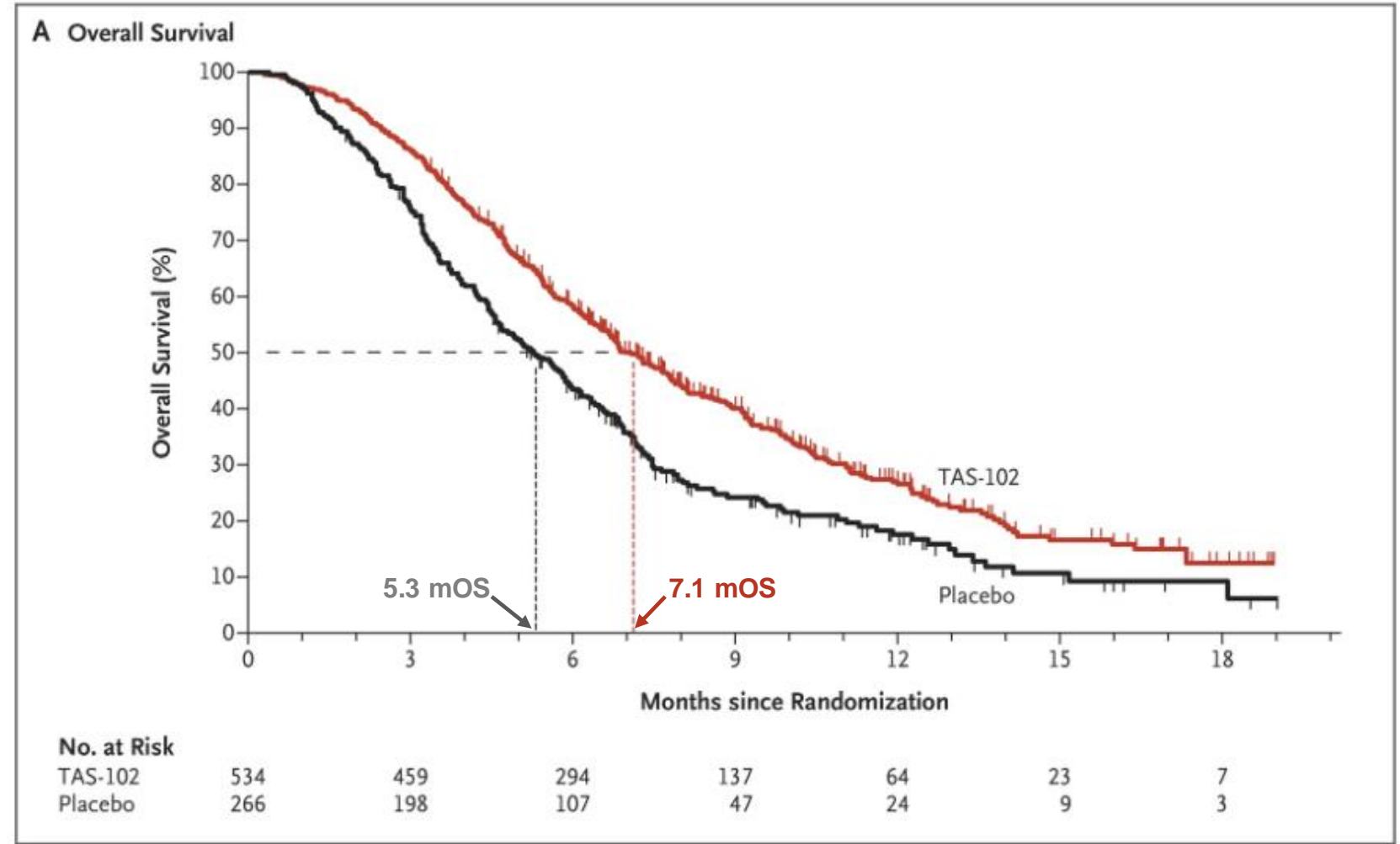
<sup>2</sup> Includes all types of colorectal cancer (CRC). ImmVirX focus on MMRp (Mismatch Repair Proficient) accounting for ~94% of all CRC (Dung et al., Science, 2017; 357 (6349):409-413).

<sup>3</sup> ICI ORR = Immune Checkpoint Inhibitor Overall Response Rate



# Limited Efficacy and Significant Toxicity of Therapies in Late-Stage Colorectal Cancer

- TAS-102 is an oral chemotherapy used in late-stage CRC
- Large randomized trial demonstrated that TAS-102 improved median overall survival by 1.8 months
- TAS-102 associated with significant adverse events including neutropenia and leukopenia
- Urgent need for better therapies in this setting to extend survival without significant toxicity



Mayer RJ et al. *N Engl J Med* 2015; 372:1909-1919

# ImmVirX: Receptor Targeted Oncolytic Virus

## Platform

- Proprietary bio-selection platform for receptor targeted oncolytic RNA viruses
- Selection for extracellular receptor targeting drives exquisite selectivity and potency in specific tumor types
- Oncolytic potency enables development of non-genetically modified virus with potential for future “armed” virus to express key immune stimulatory molecules

## Proven Mechanism

- RNA virus drives tumor inflammation and immune cell infiltration via RIG-I pathway activation
- De-risked through preclinical in vitro and in vivo proof-of-concept. Comparable to oncolytic activity and molecular mechanism of CAVATAK but now in other tumour types and using different receptor.

## Clinical Strategy

- Virus specificity enables targeted approach in indications with high unmet needs including colorectal, gastric, ovarian, liver, and breast cancer
- Planned combination therapy with immune checkpoint inhibitors in indications with poor response rates to readily detect signals of activity
- Clear clinical development pathway with trial initiation expected Q4 2022



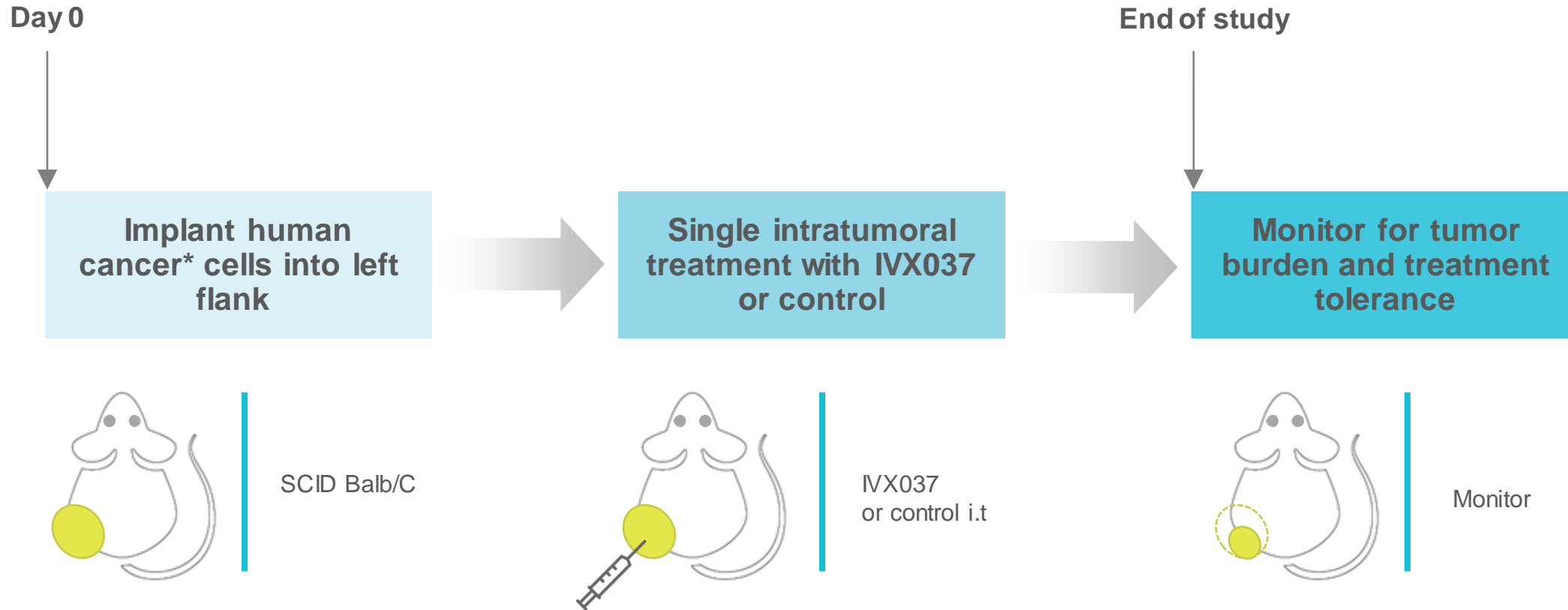
## IVX037



Lead Candidate  
Receptor Targeted  
RNA Oncolytic Virus

# Measuring *In Vivo* Oncolytic Activity of IVX037

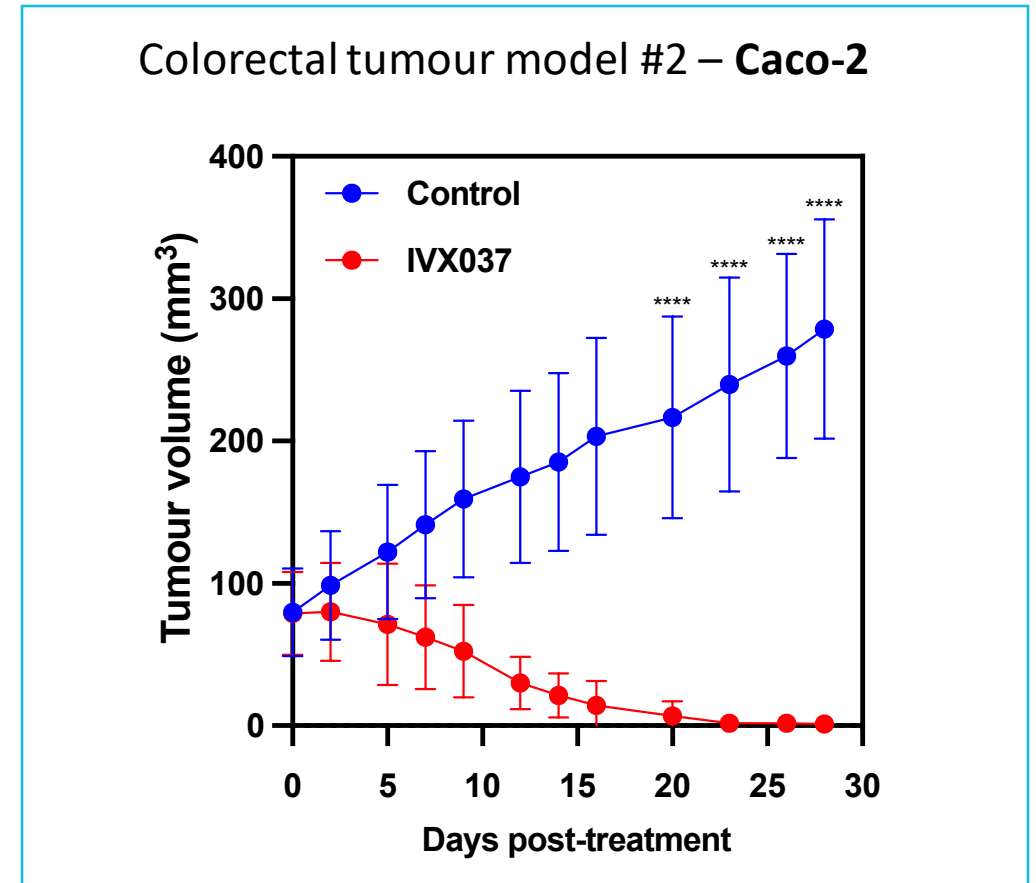
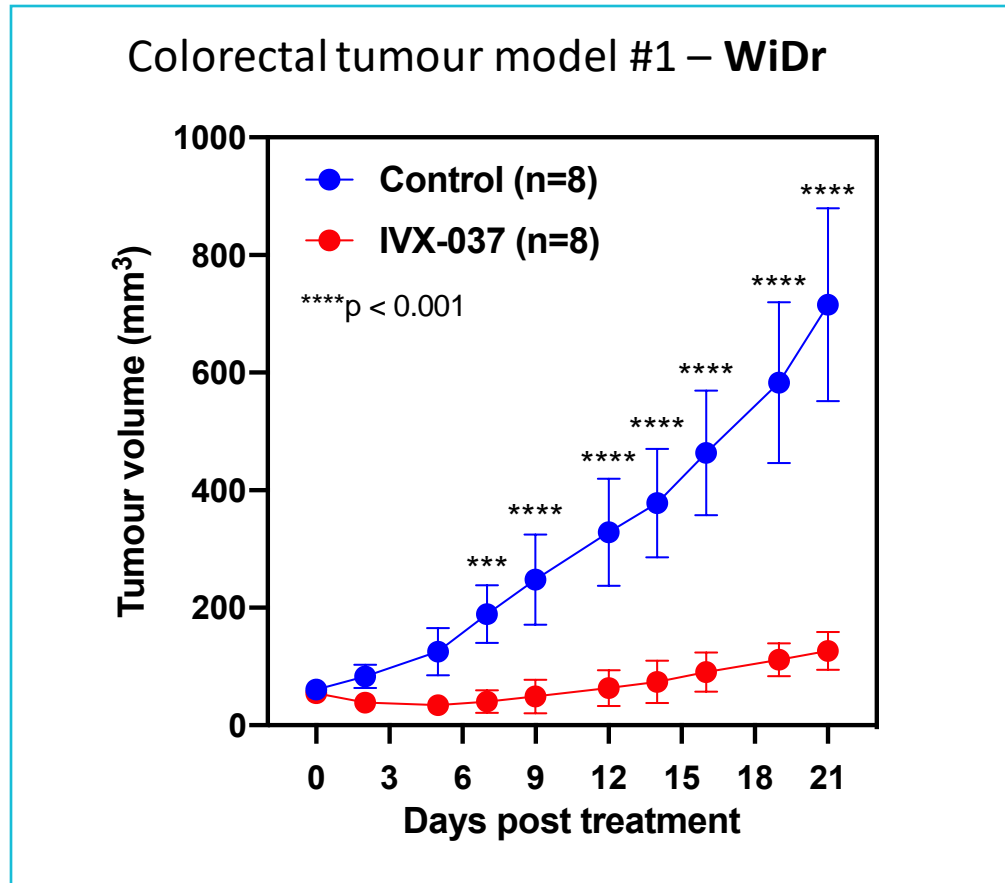
## Human cancer xenograft model



\* Assessing human colorectal (X2), gastric (X1) and ovarian (X2) cancer cell lines in initial studies

# IVX037: *In Vivo* Oncolytic Activity in Colorectal Cancer

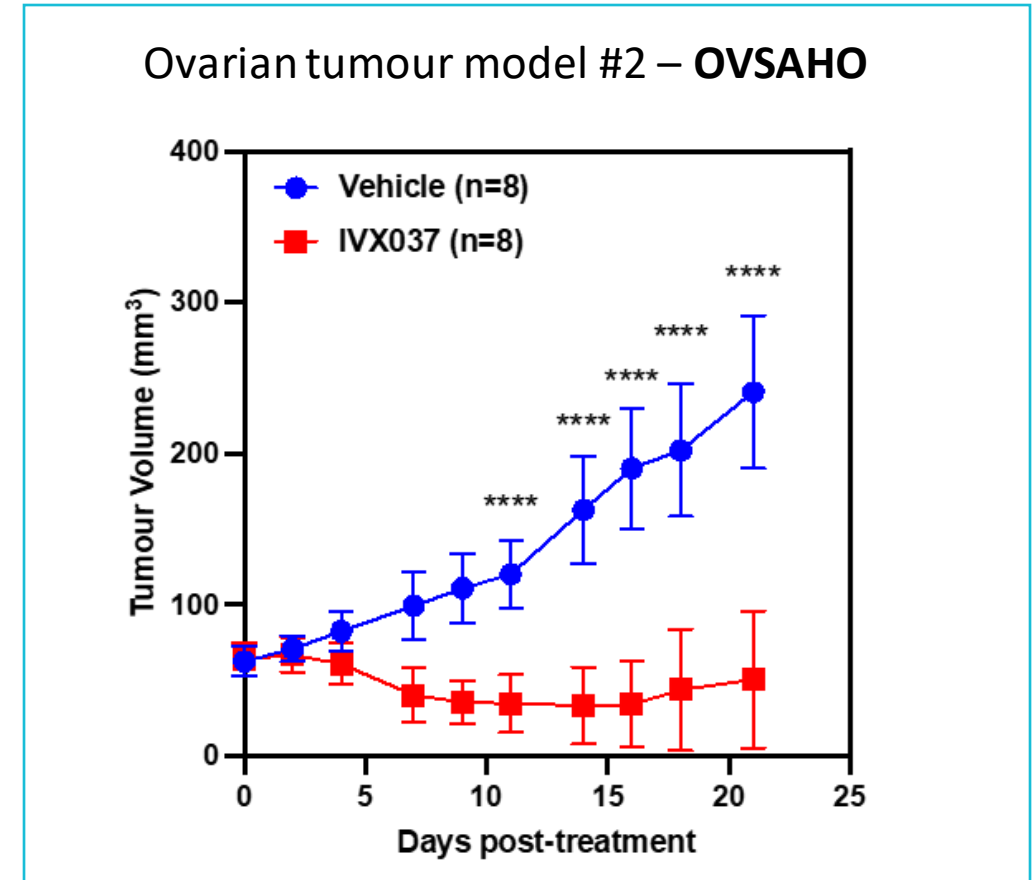
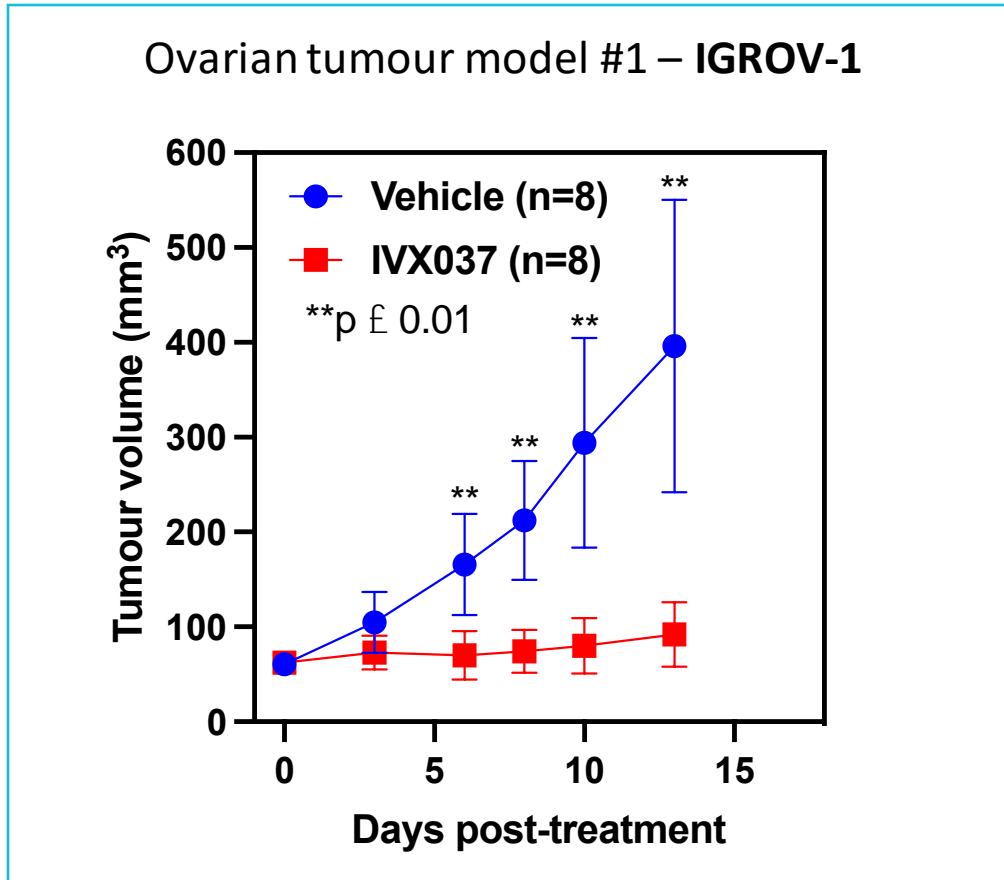
Two human MSS colorectal cancer cell lines assessed in xenograft models



Striking impact in two colorectal cancer models in immune deficient mice provides clear signal of potency solely attributed to oncolytic activity of IVX037 with favorable tolerability

# IVX037: *In Vivo* Oncolytic Activity in Ovarian Cancer

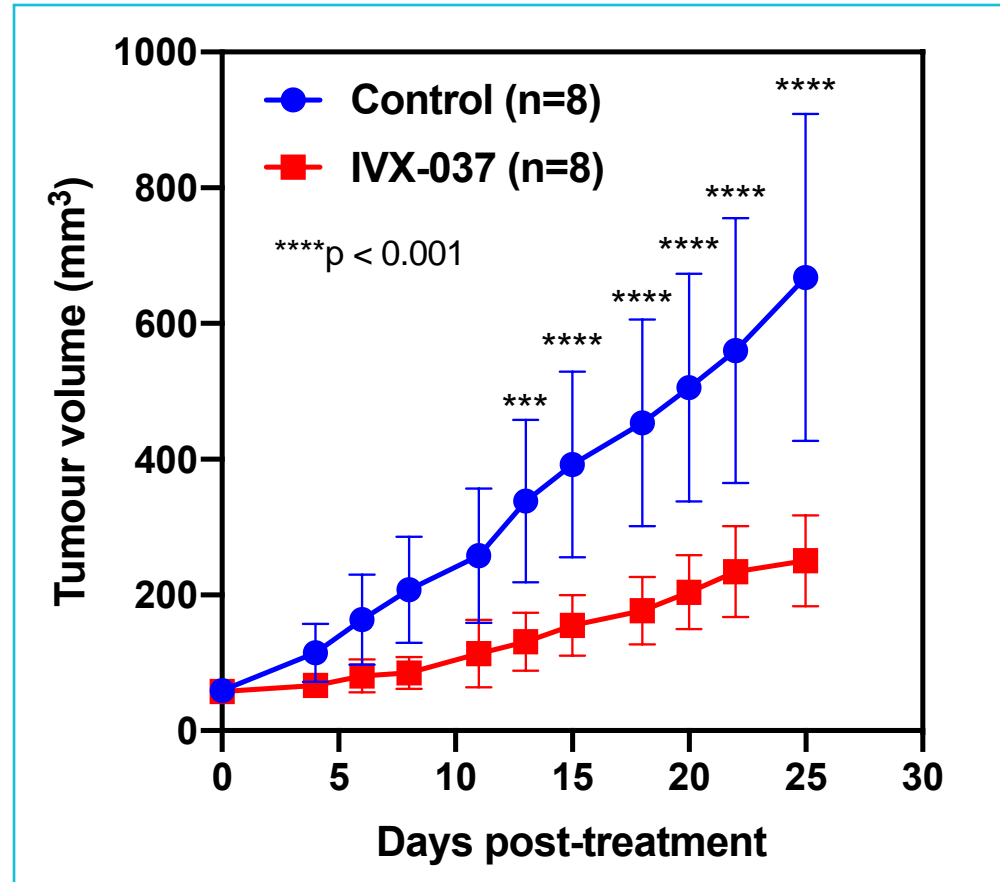
Two human ovarian cancer cell lines assessed in xenograft models



Striking reduction in tumor volume provides clear signal of potency solely attributed to oncolytic activity of single dose of IVX037 with favorable tolerability

# IVX037: Demonstrated *In Vivo* Oncolytic Activity in Gastric Cancer

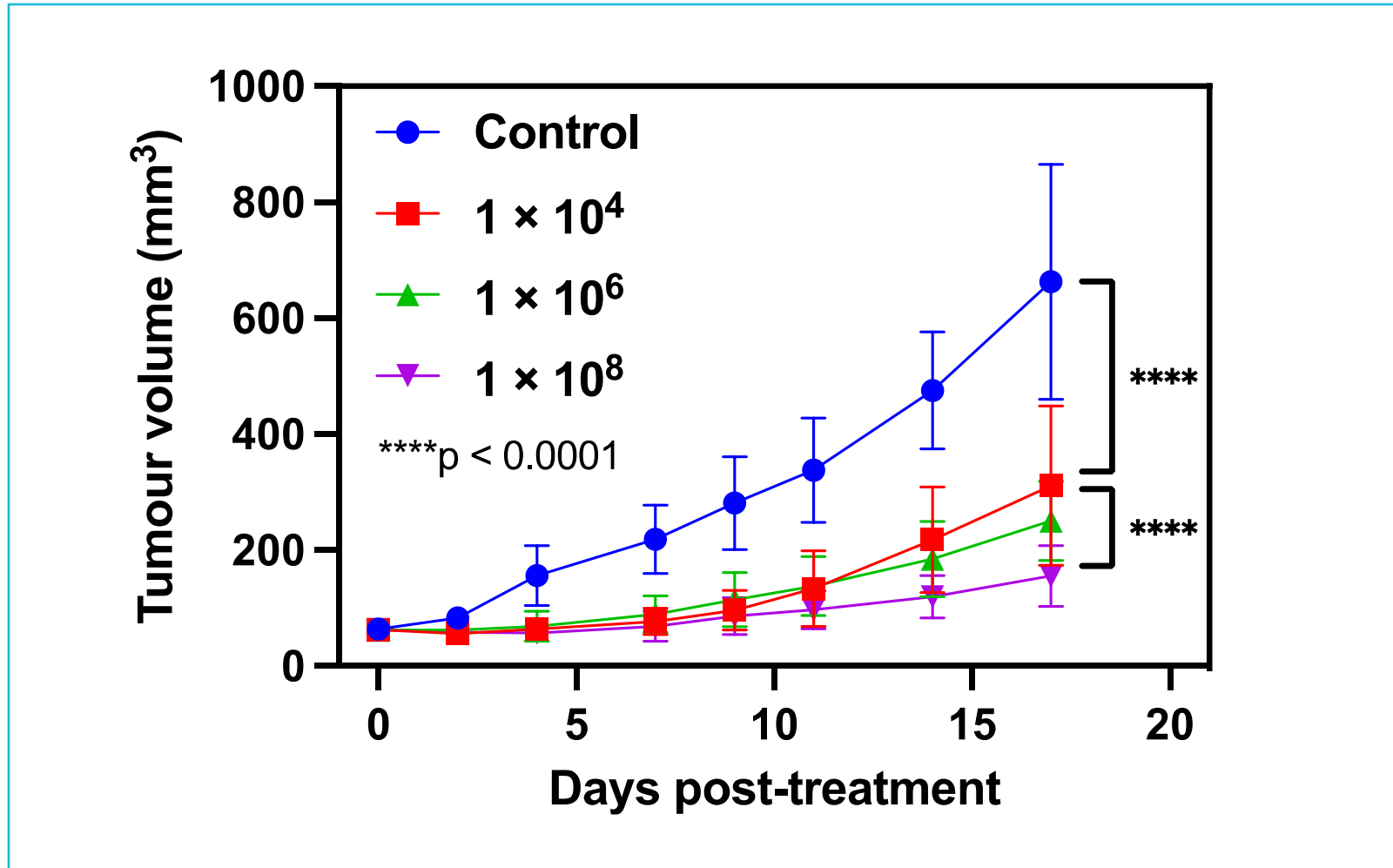
## Human Gastric cancer (NCI-N87) xenograft model



Activity of single dose of IVX037 demonstrated in gastric cancer with favorable tolerability

# Potency Observed Across Dose Levels

## Dose escalation in human MSS colorectal cancer (WiDr) xenograft model

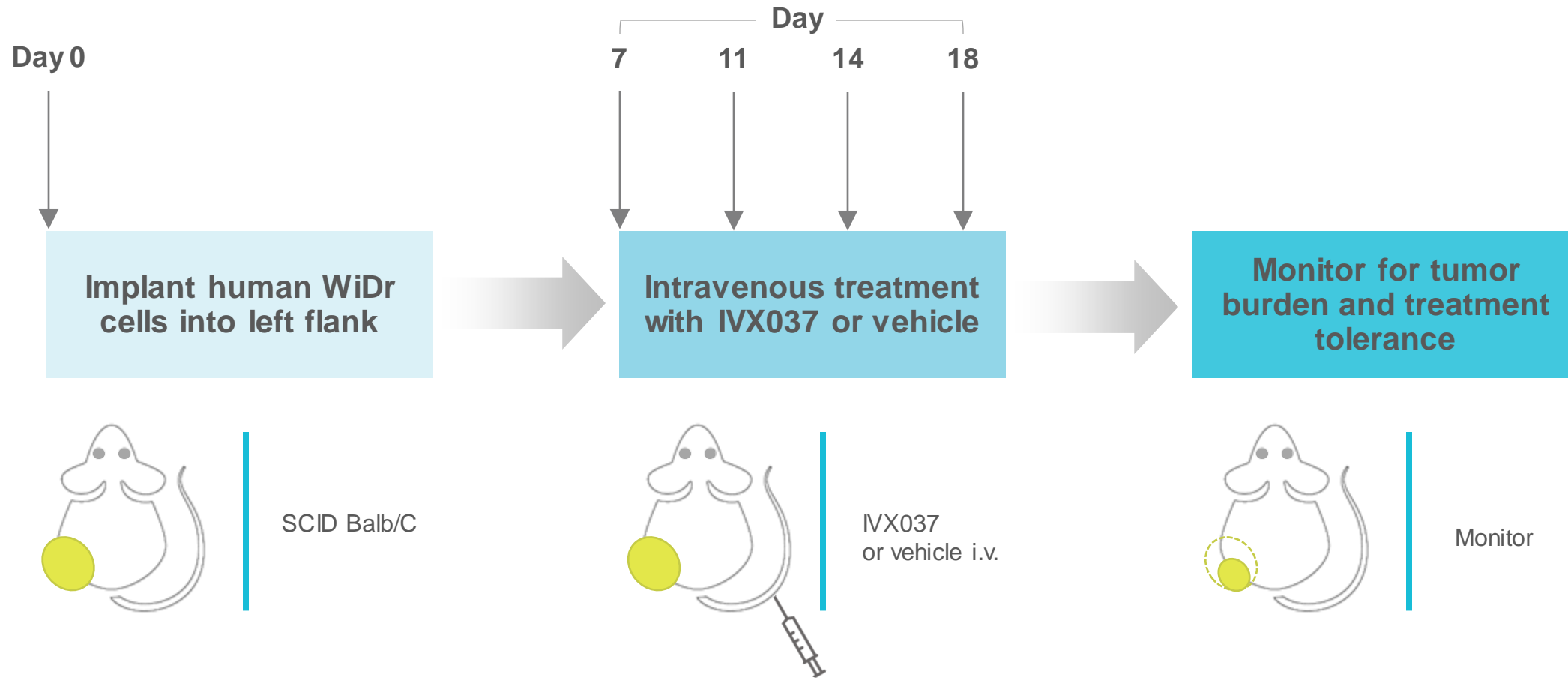


IVX037 potency enables robust antitumor activity at a 10,000-fold lower dose



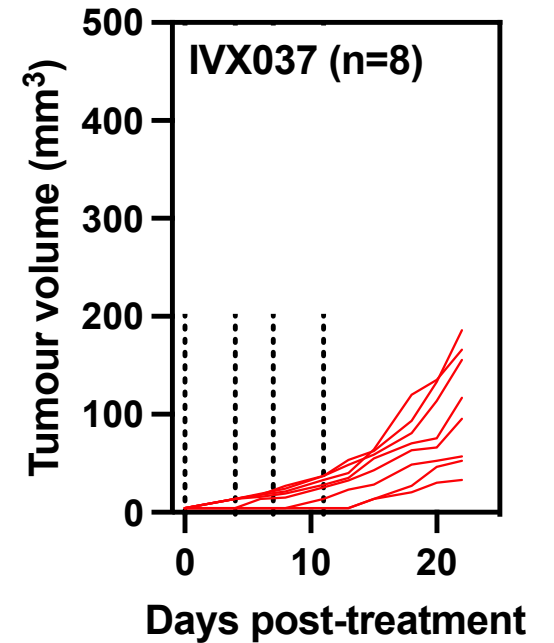
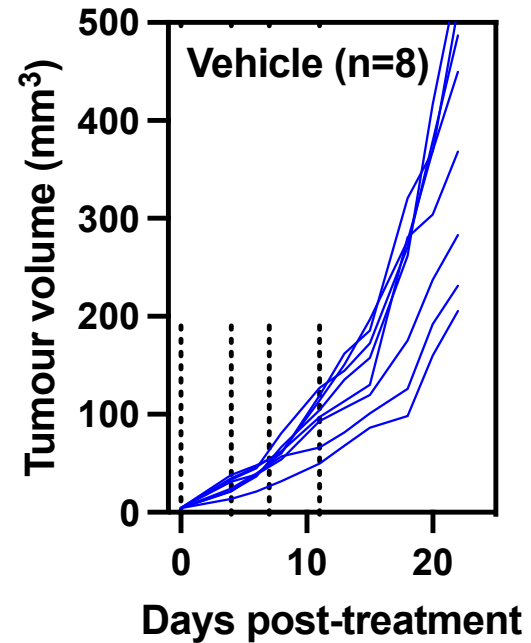
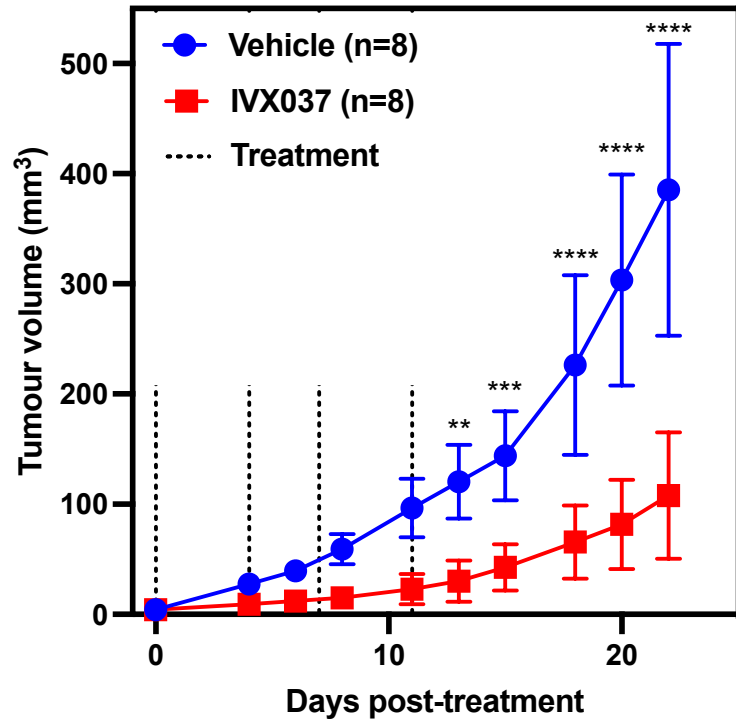
# Measuring *In Vivo* Oncolytic Activity of IVX037 Intravenously

## Human MSS colorectal cancer (WiDr) xenograft model – intravenous delivery



# Intravenous Delivery of IVX037 Achievable in Colorectal Xenograft

## Human MSS colorectal cancer (WiDr) xenograft model – intravenous delivery



Evidence of impressive anti-tumour efficacy and no treatment related toxicity observed

# Preclinical Toxicology Summary: IVX037 was Safe and Well Tolerated

## Gross pathology

- Observations during necropsy of vehicle and IVX037 treated mice, unremarkable
- Weight gains and organ weights comparable between vehicle and IVX037 treated mice

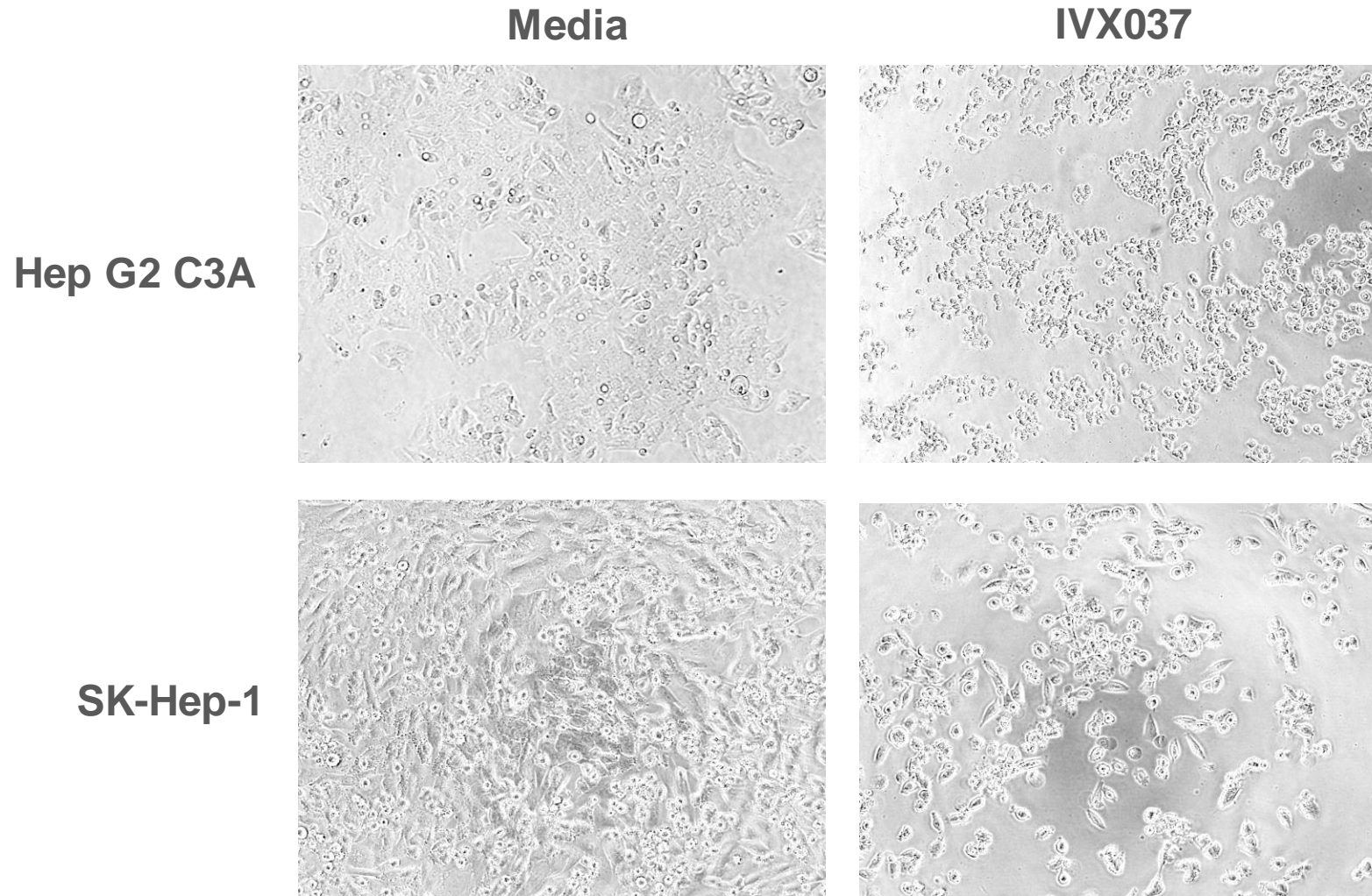
## Biochemistry/Haematology

- IVX037 undetected in serum by qPCR at 21 days post-intrahepatic injection (x3)
- Biochemistry and Haematology analysis, vehicle and IVX037 treated mice, unremarkable.

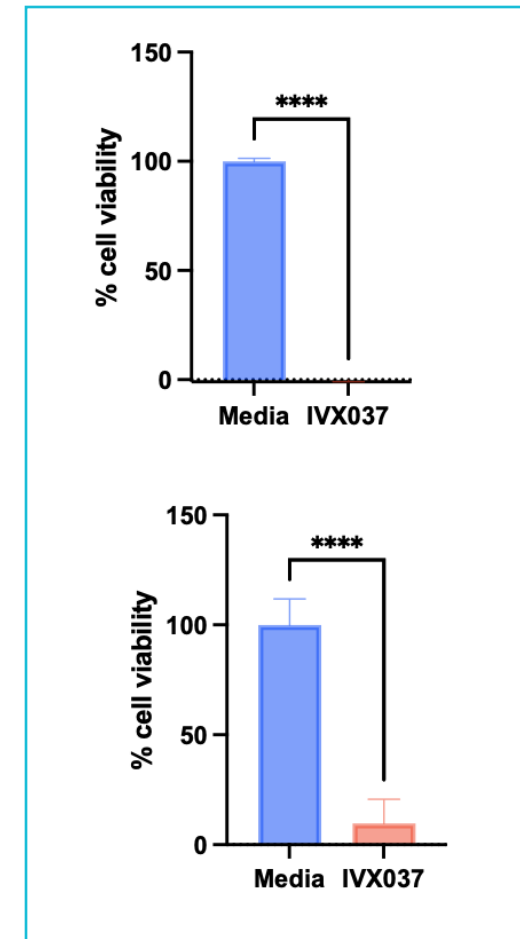
## Histopathology

- Histopathological findings of the liver were either incidental or artefactual and not attributable to the administration of IVX037
- No significant histological changes in the spleen
- Remaining organs had no significant findings

# Confirmed Cell death in Liver Cancer Cells

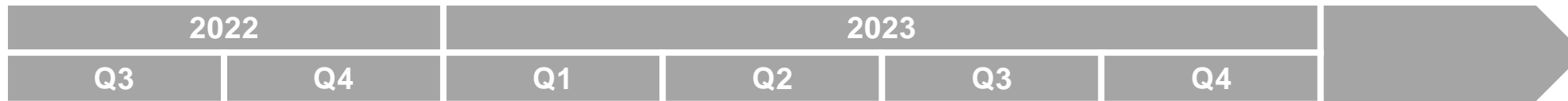


## Cell viability assay

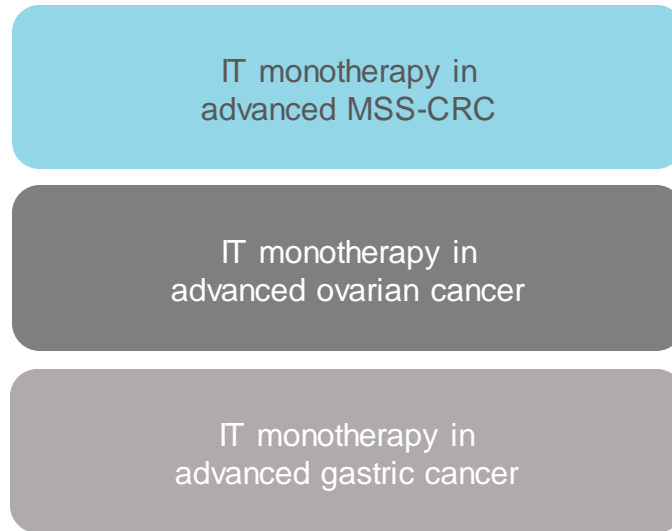


**Cytopathic effects in hepatocellular carcinoma cells resulting from IVX037 infection. Cells have lost their original structure and are unable to reproduce**

# Clear Path Forward in the Clinic

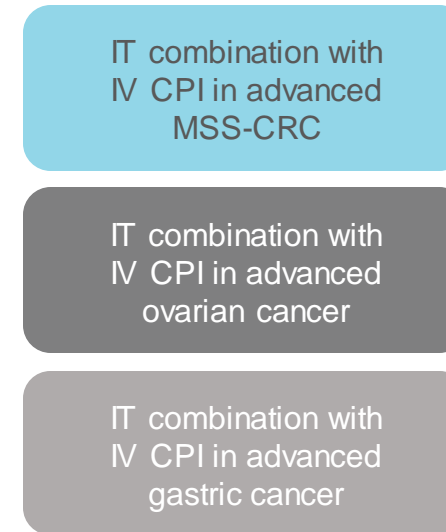


Phase 1  
dose escalation  
proof-of-concept



**Basket study  
(n = 24-27)**

Phase 1b proof-of-  
concept in combination  
with checkpoint inhibitor



**Basket study  
(n = 45)**



**Clinical strategy leverages potential to:**

- De-risk program with early biomarker data
- Develop biomarker informed/stratified future programs

IT – intratumoral  
MSS-CRC – Microsatellite Stable Colorectal Cancer  
RP2D – Recommended Phase 2 Dose

# Update: Significant progress since June 2022

## Preclinical / IP / Corporate

- Successful completion of the preclinical toxicology studies
- Underway with assessment in liver and breast cancer cell line studies
- Applied for further credit of \$2.81M from the Federal Government RDTI program
- Extended agreement with HMRI through to November 2024

## CMC / Quality

- Excellent yields from production batch for first in patient studies
- Drug Product fill completed with final testing underway
- Completion of engineering run batch at US site
- Qualification of analytical assays for product testing
- IVX037 Drug Product stable for 6 months at -80°C and -25°C, studies at 2-8°C ongoing

## Clinical

- Site selection visits complete at 3 Australian sites
- Ethics and TGA approval for first Australian site
- Ongoing strong clinician interest in trial participation

**Strengthened team as we approach first in patient studies with 20 staff at the Newcastle facility**

# Upcoming Milestones – through to Q1 2023

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## Preclinical / IP

- Preclinical studies to be conducted including investigation of combination immunotherapies
- Complete preclinical assessment in liver and breast cancer indications
- Strengthen patent position with further filings

## CMC / Quality

- Second production batch for Australian sites
- Initiate first GMP batch at US site
- Further stability data on improved formulation

## Clinical

- First site initiation and first patient on trial
- Achieve approval for other Australian Clinical Trial Sites
- Planning for US FDA IND filing

# Summary

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- Major opportunity in most important cancers with high unmet need
- Strong pre-clinical data set across multiple cancer types
- Drug Product for clinic near complete. Adding US CMO site with product in mid 2023
- Clinical stage oncology company by Q4 2022
- Clinical data readouts through 2023
- Options to partner / licence / sell / list as clinical data unfolds
- Other opportunities in early pipeline
- Strong cash position with runway to mid 2024



# ImmVirX

Receptor Targeted Oncolytic Viruses

**Thank You**

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