IMUGENE
Developing Cancer Immunotherapies

IMUGENE

November 2019

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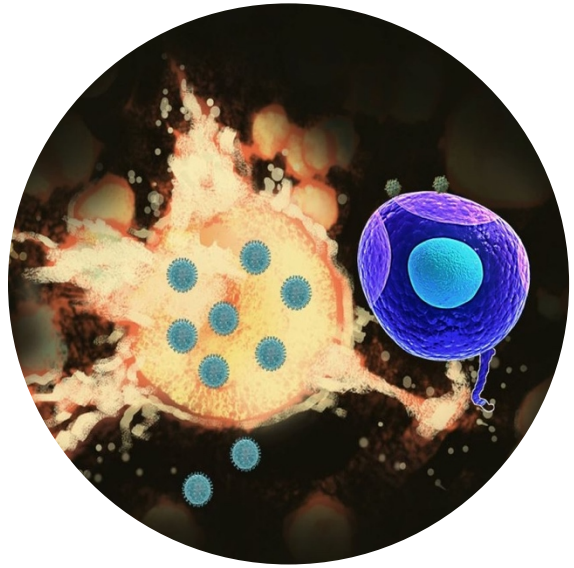
INTRODUCTION TO IMUGENE

- Imugene is a biotech company headquartered in Australia and publicly traded on the Australian Securities Exchange (ASX:IMU)
- Technology originated from the Medical University of Vienna, invented by Prof Christoph Zielinski and Prof Ursula Wiedermann
- Late 2013, Paul Hopper built Imugene around this technology
- 2017: HER-Vaxx, our HER2 targeted B-Cell Immunotherapy, entered the clinic
- 2018: Licensed extensive B cell portfolio from OSU and Mayo Clinic comprising of HER1, HER2, HER3, VEGF, IGF-1R, CD28, combinations thereof and the PD-1 B-Cell Immunotherapy
- July, 2019: Licensed a prolific oncolytic virus from City of Hope

INVESTMENT HIGHLIGHTS

- Novel technology in one of the most sought-after areas of cancer immunotherapy today: oncolytic viruses a.k.a. cancer killing viruses that stimulate immune recognition of cancer and our B-cell Immunotherapy pipeline
- CF33 poised to enter into 2 x Phase 1 clinical trials in 2020; PD1-Vaxx to enter into phase 1 study in 2020
- Robust intellectual property: long patent life & composition of matter for CF33 to 2037 and HER-Vaxx to 2036
- Highly experienced immunotherapy developers including the oncolytic virus team (all ex-viralytics)
- Potential applications across many cancers, including combination with CTLA4/PD-1/PD-L1 checkpoint inhibitors or with engineered immune cells
- Outstanding scientific provenance across all our technology: B-cell immunotherapies from Medical University of Vienna and OSU & CF33 from one of the US leading cancer centres, City of Hope in Los Angeles with Inventor, Professor Yuman Fong who is an internationally recognized oncolytic virus and cancer expert
- Attractive license terms - worldwide exclusive rights to the technology



International leadership team with extensive commercialisation expertise in the sector

Leslie Chong
SYDNEY, AU

Managing Director & CEO

- 21+ years of oncology experience across Phase I – III clinical development programs
- Ex Senior Clinical Program Lead at Genentech, one of the world's most successful biotech businesses which sold the best selling breast cancer drug Herceptin
- Also worked at global majors GSK and Exelixis

Paul Hopper
SYDNEY, AU

Executive Chairman

- Founder of Imugene
- Former Chairman of Viralytics
- Founder & Director of Prescient
- Chairman of SUDA Pharmaceutical
- Extensive international & ASX biotech capital markets experience particularly in immuno-oncology & vaccines

Dr Axel Hoos
PHILADELPHIA, USA

Non-Executive Director

- Senior Vice President and Head of Oncology at GSK
- Former Medical Lead for Yervoy, the first immuno-oncology treatment to improve first survival
- Chairman of the Sabin Vaccine Institute
- Co-Chair of the Cancer Immunotherapy Consortium Think-Tank

Mr Charles Walker
BRISBANE, AU

Non-Executive Director

- Experienced listed biotech CEO and CFO (ASX:ACL and ASX:IMU)
- Extensive financial markets experience having executed 50+ cross border transactions
- Clinical experience includes managing pipeline of drugs in all stages from discovery, through to Phase III to product launch

Dr Jens Eckstein
CAMBRIDGE, USA

Non-Executive Director

- Managing Partner of Apollo Ventures
- Former president of SR One Ltd., the VC arm of GSK
- 15+ years in VC experience funding early to clinical stage biopharmaceutical companies
- Extensive experience as chairman, board director and founder of several biotechnology and venture capital companies.
- Creator of OneStart, the world's largest life science accelerator

Dr Lesley Russell
PHILADELPHIA, USA

Non-Executive Director

- 25+ years of senior international operational and leadership experience having worked at Amgen, Eli Lilly, Teva, and Cephalon
- Extensive knowledge and experience with new drug development

Imugene has a team with oncology drug development experience

Imugene's Scientific Advisory Board consists of world leading oncologists, researchers and developers

Prof Pravin Kaumaya
OHIO STATE UNIVERSITY, USA

- Prof of Medicine Department of Obstetric Gynecology at Ohio State University
- Research focus in tumour immunology, mechanisms of tumour cell-immune cell interactions, and immune mechanisms
- Research focus on fields of vaccine with emphasis on peptide vaccines for cancer

Dr. Michael Galigiuri
CITY OF HOPE, USA

- President of City of Hope National Medical Center and holds the Deana and Steve Campbell Physician-in-Chief.
- Recent President of the American Association for Cancer Research (AACR) in 2017

Prof. Josep Tabernero
VALL D'HEBRON, BARCELONA, SPAIN

- President of European Society for Medical Oncology (ESMO)
- President of the Medical Oncology Department at the Vall d'Hebron
- Director of the Vall d"Hebron Institute of Oncology (VHIO)

Prof Tanios Bekail Saab
MAYO CLINIC, USA

- Professor of College of Medicine and Science
- Program Co-Leader, GI Cancer, Mayo Clinic Cancer Center
- Medical Director, Cancer Clinical Research Office (CCRO)
- Senior Associate Consultant, Mayo Clinic AZ

Prof Peter Schmid
BARTS CANCER INSTITUTE, UK

- Medical Oncologist
- Expertise in breast and lung cancer, cancer immunotherapy and early drug development
- Leads the Centre of Experimental Medicine at Barts Cancer Institute

Prof. Ursula Wiedermann-Schmidt
UNIVERSITY OF VIENNA, AUSTRIA

- Co-inventor of HER-Vaxx
- Professor of Vaccinology at Medical University of Vienna

Dr Neil Segal
MEMORIAL SLOAN KETTERING CANCER CENTER, USA

- Medical Oncologist
- Expertise in GI, Colon, Pancreatic cancers
- Active clinical immuno-oncology researcher
- Clinical lead in several trials using PD-L1 inhibitors

Dr Yelina Janjigian
MEMORIAL SLOAN KETTERING CANCER CENTER, USA

- Medical Oncologist
- Expertise in esophageal and stomach (gastric) cancer
- Active in GI clinical trials testing combinations of Her-2 and checkpoint inhibitor therapies

Imugene has a world renowned advisory board of scientists and oncologists

ONCOLYTIC VIRUS SCIENTIFIC ADVISORS

Professor Yuman Fong, OV SAB Chair

Prasad S. Adusumilli

Deputy Chief, Thoracic Service; Co-Director, Mesothelioma Program; Head, Solid Tumors Cell Therapy, Cellular Therapeutics Center. Memorial Sloan Kettering Cancer Centre. These therapies include immunotherapy (enhancing patients' own immune systems using genetic and cell engineering) and oncolytic viral therapy (killing cancer cells using genetically engineered viruses).

Dr Rebecca Auer

Associate Scientist Cancer Therapeutics Program, The Ottawa Hospital Research Institute and Cross-Appointed Member, Associate Professor Department of Surgery and Department Biochemistry, Microbiology and Immunology University of Ottawa. Director of Cancer Research Ottawa Hospital.

Prof James Market

James Garber Galbraith Endowed Chair of Neurosurgery, University of Alabama at Birmingham. His major interest remains the use of herpes simplex virus and other viruses as oncolytic and gene therapy vectors for the treatment of malignant brain tumors and other cancers

EXECUTIVE SUMMARY

Imugene is acquiring the worldwide exclusive license to a promising **oncolytic virus technology** developed at the City of Hope Cancer Centre in Los Angeles.

The virus, known as CF33, is a chimeric poxvirus, and is poised to enter Phase 1 clinical trials in 2020.

LANDSCAPE: RECENT ONCOLYTIC VIRUS TRANSACTIONS

IMUGENE
Developing Cancer Immunotherapies

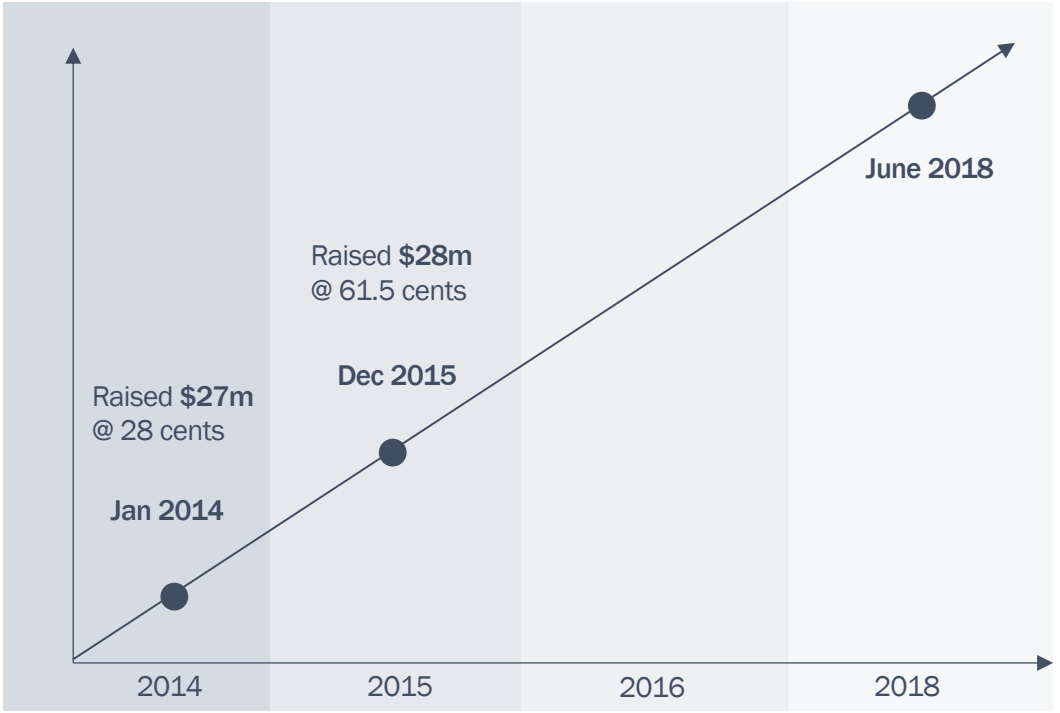
Oncolytic viruses are attracting the serious attention of big pharma companies such as Merck, Boehringer and Janssen which have made three acquisitions in 2018 alone totalling **over $1.0 billion**, including Viralytics.

VIRALYTICS CASE STUDY

ACQUIRED BY MERCK FOR $502M

$502M Acquired by **MERCK** @$1.75

Virus	Picornovirus/coxsackie
Stage of Development	Phase 2
Disease types	Melanoma, bladder, colorectal, non small cell lung
Industry collaboration	Checkpoint combination trial with Merck
Investors	Orbimed, Abbingworth, Baker Bros, BVF, Quest
Team	Paul Hopper (Chair), McColl, Prof Darren Shafren, Turvey, Post



THE INVENTOR & CITY OF HOPE

Professor

Yuman Fong

the MIRACLE of SCIENCE with SOUL
City of Hope

A pioneer, both in the operating room and in the laboratory, Prof Yuman Fong, M.D., The Sangiacomo Family Chair in Surgical Oncology and chair of The City of Hope Dept of Surgery is an *internationally recognized expert* in liver and pancreatic cancer. He has developed many new surgical techniques and instruments. He has also led research efforts to use genetically modified viruses to destroy cancer cells.

Prof Fong joined City of Hope in 2014 after more than two decades at the renowned Memorial Sloan-Kettering Cancer Center in New York City.

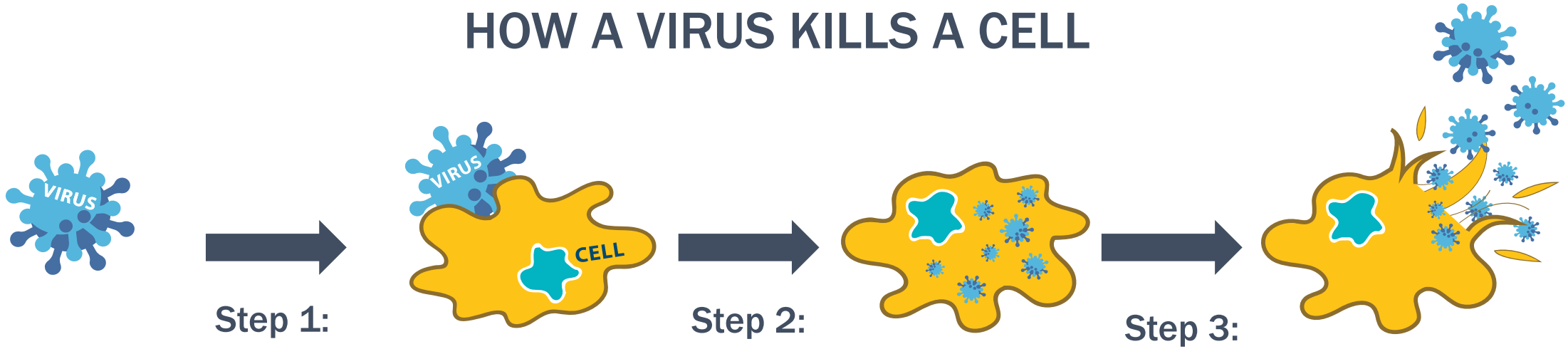
Prof Fong is both an *author and innovator*. He has written and edited over 700 scholarly articles as well as 14 textbooks. He is currently the Editor-in-Chief of ***Molecular Therapy Oncolytics*** (Cell Press).

Prof Fong has had leadership roles in regulatory aspects of gene therapy, including serving as Chair or the Recombinant DNA Advisory Committee of the National Institutes of Health of the United States.

City of Hope, in Los Angeles, is ***a leading research and treatment center*** for cancer, diabetes and other life-threatening diseases. Founded in 1913, it is designated as a comprehensive cancer center, the highest recognition bestowed by the National Cancer Institute. City of Hope is also a founding member of the National Comprehensive Cancer Network, with research and treatment protocols that advance care throughout the US.
City of Hope has been ranked as one of the nation's "Best Hospitals" in cancer by *U.S. News & World Report* for over 10 years.
City of Hope has GMP facilities that produces clinical trials materials for many academic centers and is the alpha clinic trials site for CIRM

ONCOLYTIC VIRUS (CF33) MECHANISM OF ACTION

HOW A VIRUS KILLS A CELL



Step 1:
Virus enters cell

Step 2:
Virus duplicates itself

Step 3:
Cell explodes, releasing thousands of brand new virus particles

- **Direct infection,** replication within and cancer cell killing
- **Viral infection** increases local checkpoint targets (PD-1, PD-L1, CTLA4 etc), stimulating the immune system to recognise tumors
- **Cell death** is immunogenic [surface expression of calreticulin, release of adenosine triphosphate (ATP) and release of high mobility group box 1 (HMGB1)]
- **Human sodium** iodine symporter (hNIS) expression allows additional use of ^{131}Iodine or ^{188}Rhenium killing of infected cells and adjacent cells

MAJOR ADVANTAGES OF CF33

Preclinical data has demonstrated that CF33 is more **efficacious** than all parental viruses and some viruses in clinical trials.

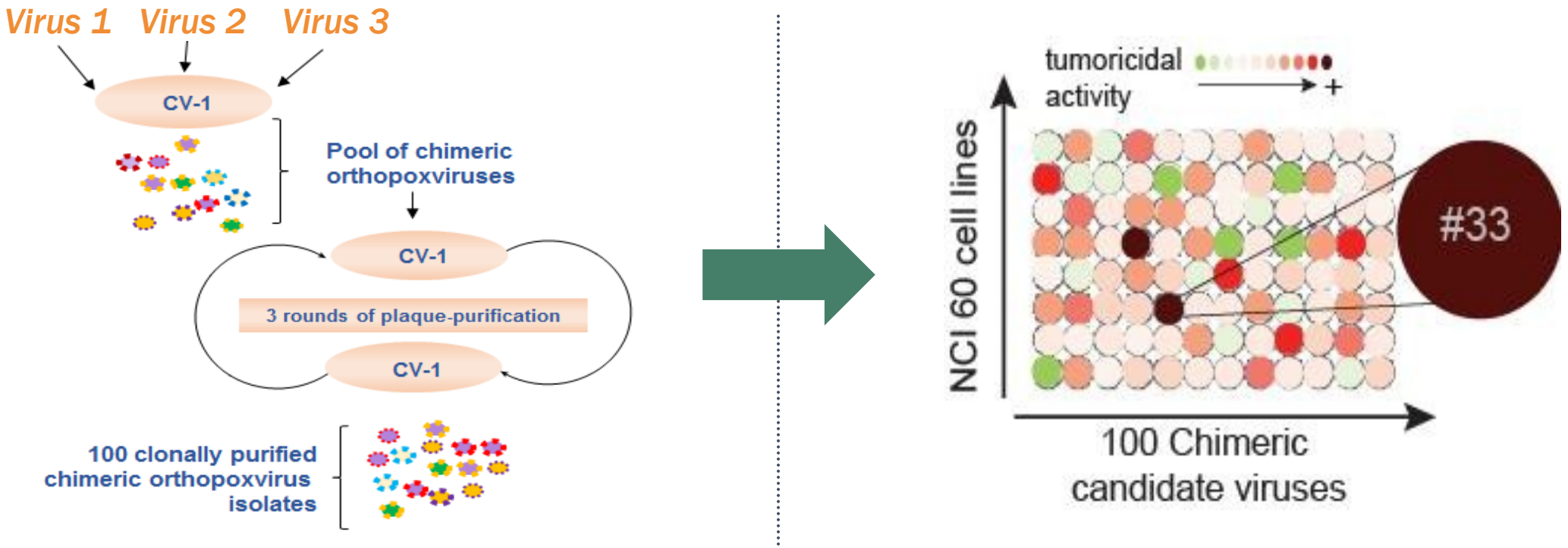
Especially impressing is that CF33 can **shrink multiple types** of cancer at an extremely low dose (1000 PFU). Also the potential to be more **synergistic** with standard-of-care therapies and emerging novel therapies

Importantly, CF33 **shrinks** not only injected tumors, but also non-injected **distant tumors** (abscopal effect).

KEY DIFFERENTIATION

1. **DNA virus -** Much easier to manipulate and vectorize to carry foreign gene as therapeutic payloads
2. **CF33 -** more potent in terms of;
   a) Range of cancer cell types infectible,
   b) Low doses necessary for cancer killing in vitro and in vivo, and
   c) Therapeutic window (dose for toxicity minus dose for efficacy)
3. **CF33** can be made in high titres
4. **CF33** can be used in multiple doses without complete neutralization by host immune system

HOW WAS CF33 DERIVED?



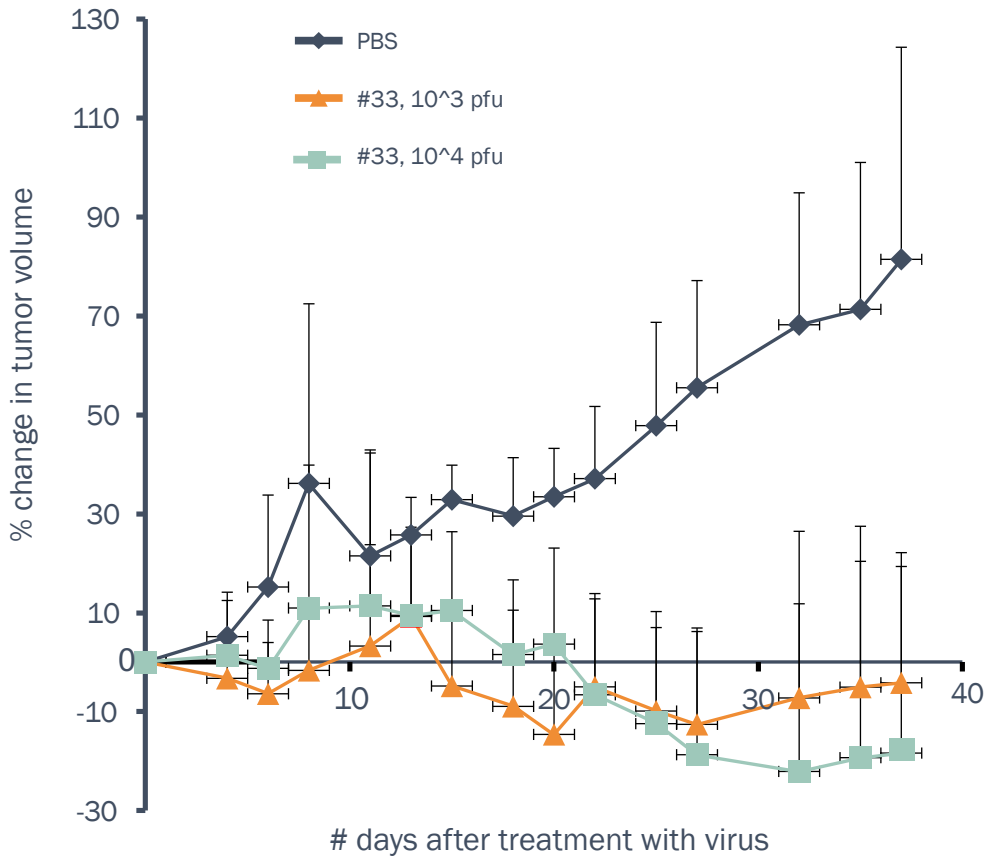
1. 100 chimeric orthpoxviruses and 100 chimeric parapoxviruses were generated
2. Several orthopoxvirus and parapoxvirus chimeras showed superior cancer cell killing in the NCI-60 cell lines
3. CF33 is the chimeric orthopoxvirus chosen for further evaluation *in vivo* and clinical development

CF33 SHRINKS TRIPLE-NEGATIVE BREAST CANCER

Mice treated with both Intratumoral (IT) & IV virus

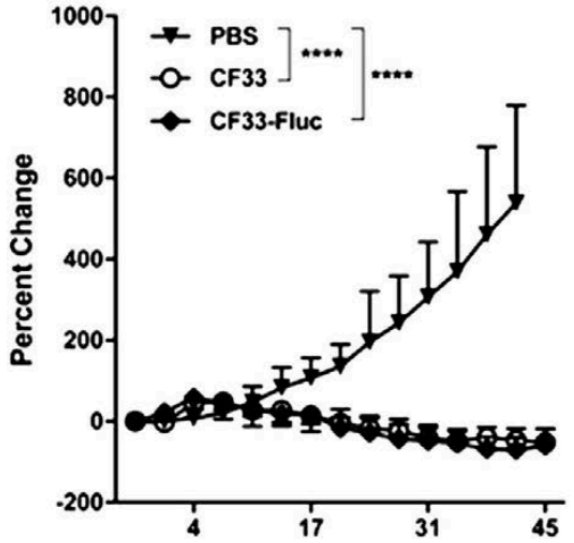
The viral dose used was **2-5 orders of magnitude** lower than doses used for oncolytic viruses under clinical testing

Mol Ther Oncolytics. 2018 Jun 29;9



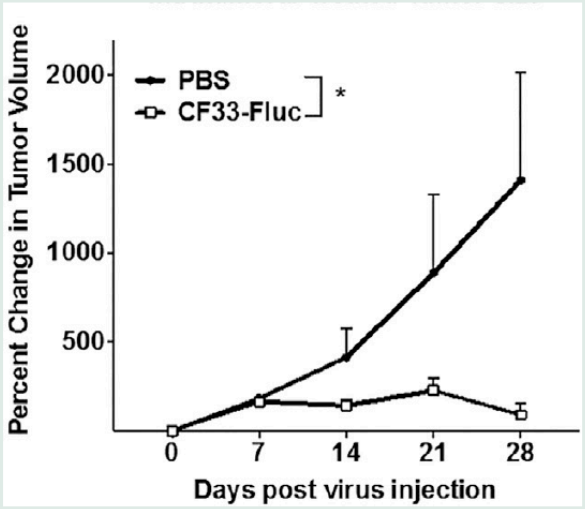
COMPELLING TUMOUR INHIBITION IN MULTIPLE CANCERS

PANCREATIC



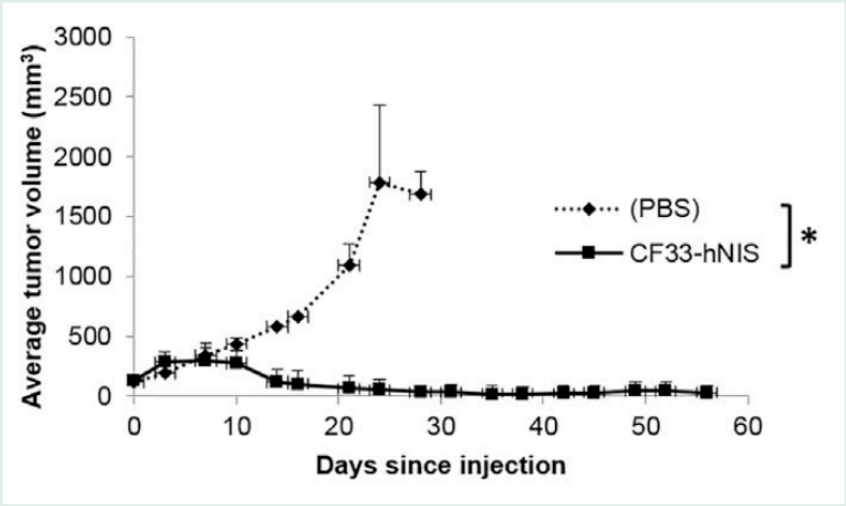
J Transl Med. 2018, 16, 110

COLORECTAL



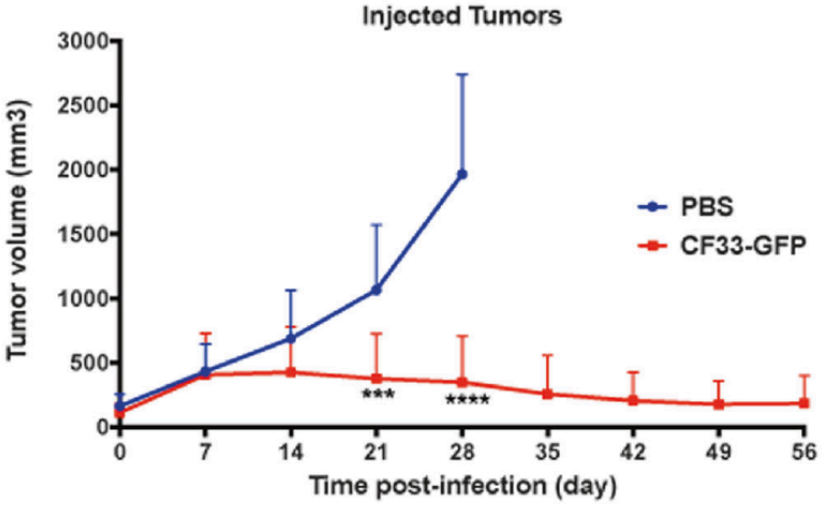
Mol Ther Oncolytics. 2018, 9, 13

COLON



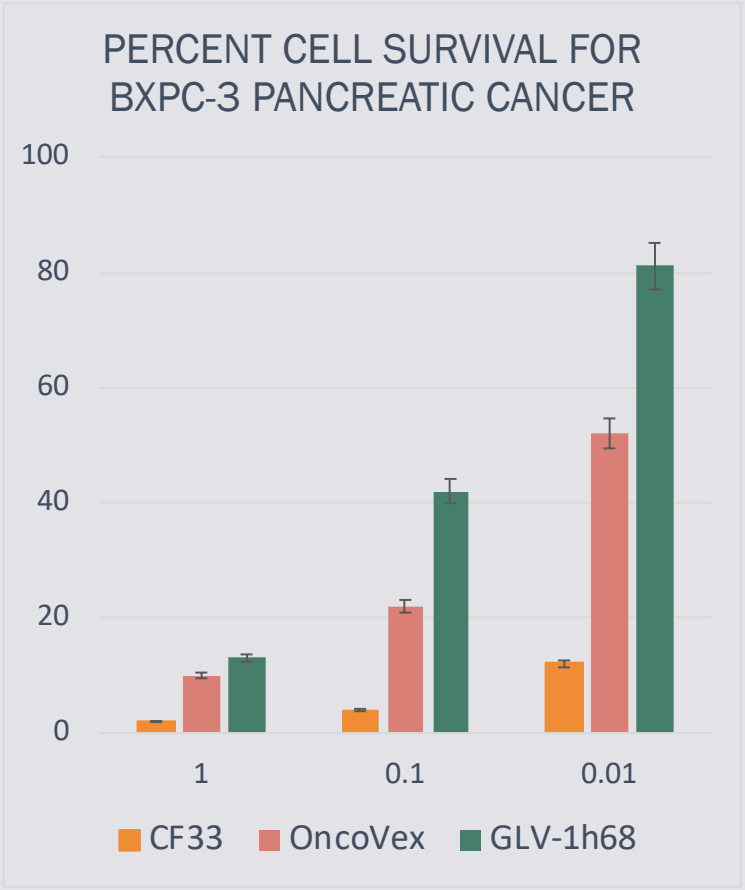
Mol Ther Oncolytics. 2019, 13, 82

LUNG

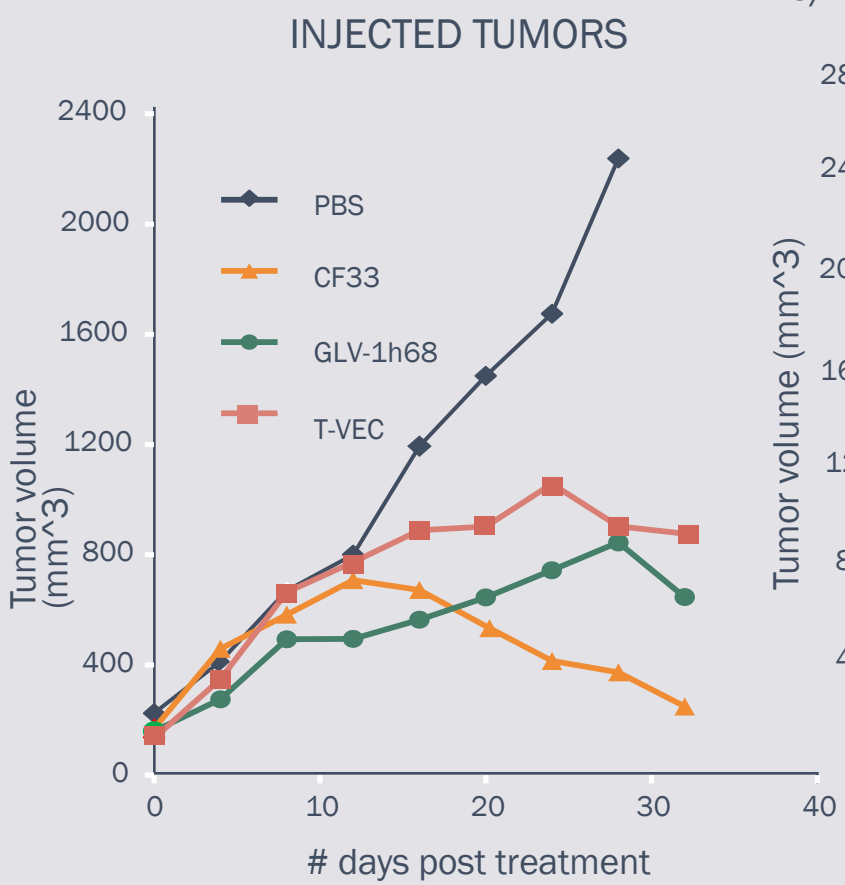


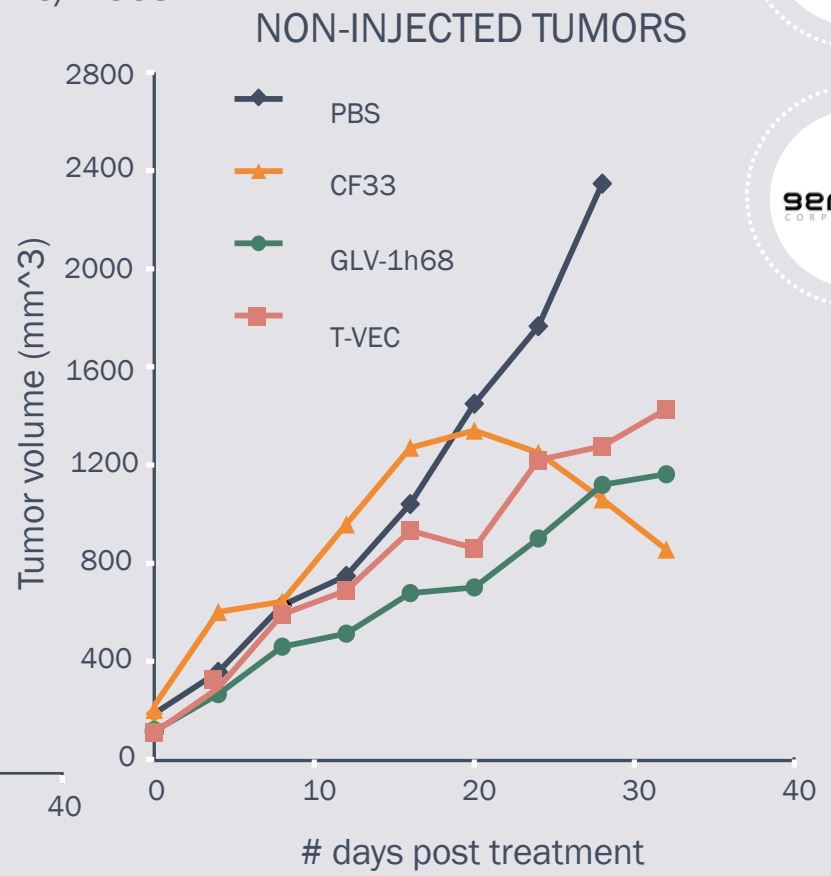
Cancer Gene Ther. 2019

CF33 OUTPERFORMS AMGEN & GENELUX VIRUSES



MICE BEARING THE A549 XENOGRAFTS WERE TREATED WITH INDICATED VIRUSES AT A DOSE OF 10^3 PFU/MOUSE





CF33 GMP MANUFACTURING AT CITY OF HOPE

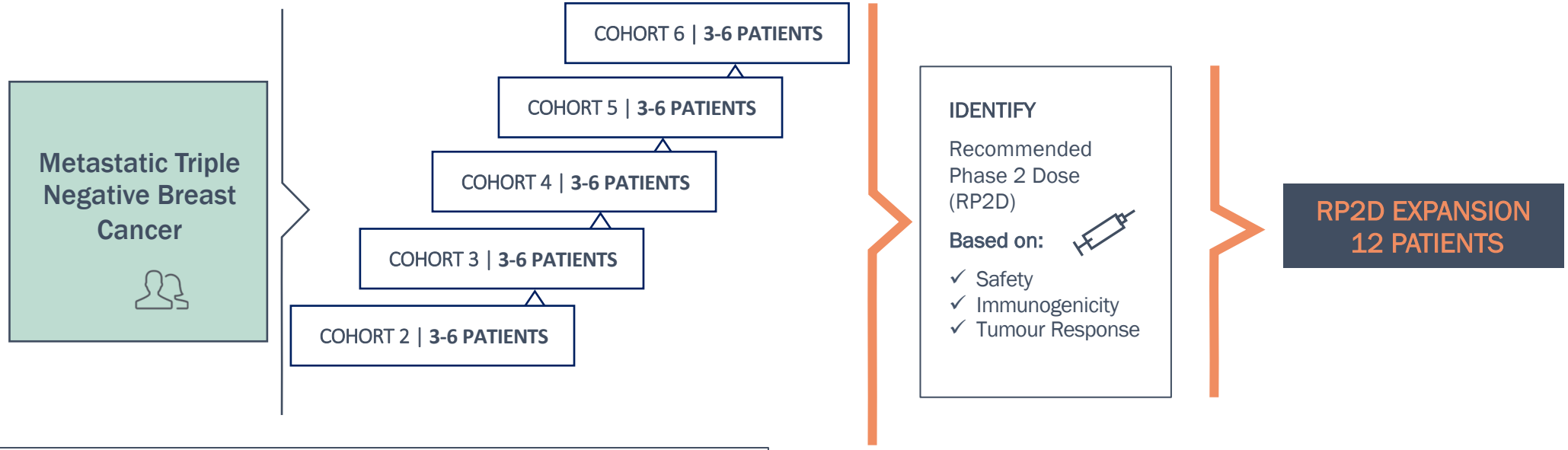
Center for biomedicine and genetics (CBG)

The Center for Biomedicine & Genetics (CBG) is a California-licensed, 20 000 square foot, multi-product biologics manufacturing facility within City of Hope. With twelve ISO7 production rooms in three product type “zones”, a dedicated aseptic fill suite and a staff with extensive biopharmaceutical experience, the CBG is capable of producing virtually any type of biologic at scales suitable for Phase I through Phase II clinical trials.

- ✓ GMP Phase 1 CHECKvacc (CF33 + hNIS + PD-L1) virus material completed

CHECKvacc: CF33 +hNIS+PD-L1

Proposed Phase 1 Triple Negative Breast Cancer Study



- ❑ 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	Part 1=18-24 ; Part 2=12
Location	Single Center: COH
Admin Route	Intratumoral (IT)
PI	Dr Yuan Yuan

Vaxinia: CF33 +hNIS

Proposed Phase 1 & Phase 2 MAST (MIXED ADVANCED SOLID TUMOURS) STUDY

	MAST Study Phase 1 Dose Seeking/Signal Finding		MAST Study Phase 2 Simon 2 Stage Design	
	Indication	Lung, TNBC, Melanoma, Bladder, Gastric, Colorectal	**Indication**	Select tumors from Phase 1
	FDA IND Study Design	1.Vaxinia: CF33-hNIS monotherapy 2.Vaxinia + Immune Checkpoint Inhibitor (ICI) Combination	**FDA IND**	Vaxinia + Immune Checkpoint Inhibitor (ICI) Combination
	N	Monotherapy: 6 cohorts of 3-6 patients Combination: 2 cohorts of 3-6 patients	**N**	Depends on the number of Indications
	Location	Multi Centre	**Location**	Multi Centre
	Admin Route	IT or IV	**Admin Route**	IT or IV

INTELLECTUAL PROPERTY

FOUNDATION PATENT (2037)

PCT	**US2017/046163**
Title	Chimeric poxvirus compositions & use thereof
Inventor	Yuman Fong
Assignee	City of Hope
Primary Date	9 August 2016
International Publication	18 February 2018

PCT application filing date was 8/9/2017, and estimated expiration date is in late 2037. The patent application includes both composition of matter and method of use. It is currently pending with the opportunity to secure worldwide rights. International search report was favorable.

(43) International Publication Date
15 February 2018 (15.02.2018)

W!P O | PCT

WO 2018/031694 Al

(51) International Patent Classification:
C12N 7/01 (2006.01) *C07K 16/28* (2006.01)
C12N 15/863 (2006.01) *A61K 31/7088* (2006.01)
C07K 14/47 (2006.01) *A61K 35/76* (2015.01)

(21) International Application Number:
PCT/US20 17/046 163

(22) International Filing Date:
09 August 2017 (09.08.2017)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
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62/5 19,010 13 June 2017 (13.06.2017) US

(71) Applicant: **CITY OF HOPE** [US/US]; 1500 E. Duarte Road, Duarte, CA 91010 (US).

(72) Inventors: **FONG, Yuman;** 5219 La Canada Boulevard, La Canada, CA 9101 1 (US). **CHEN, Nanhai;** 9167 Buck-

(74) Agent: **HETZER-EGGER, Claudia** et al; Minitz Levin Cohn Ferris Glovsky And Popeo, P.C., One Financial Center, Boston, MA 021 11 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available):* AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available):* ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV

CORE SCIENCE PUBLISHED IN LEADING PEER PUBLICATIONS

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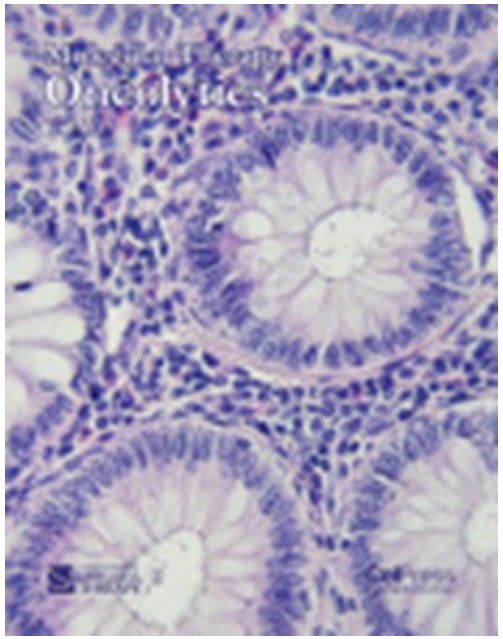
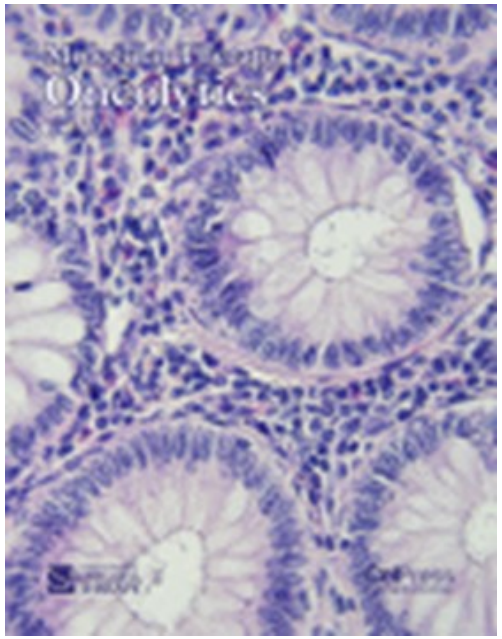
2018



Mol Ther Oncolytics. 2018 Jun 29;9

A Novel Oncolytic Chimeric Orthopoxvirus Encoding Luciferase Enables Real-Time View of **Colorectal Cancer** Cell Infection

2018



Mol Ther Oncolytics. 2018 Jun 29;9

Endogenous AKT Activity Promotes Virus Entry and Predicts Efficacy of Novel Chimeric Orthopoxvirus in **Triple-Negative Breast Cancer**

2018

J Transl Med. 2018 Apr 26;16:110

Novel Oncolytic Chimeric Orthopoxvirus Causes Regression of **Pancreatic Cancer** Xenografts and Exhibits Abscopal Effect at a Single Low Dose

2019

Cancer Gene Ther. 2019 17 June

A chimeric poxvirus with J2R (thymidine kinase) deletion shows safety and anti-tumor activity in **lung cancer** models

SELECTED ONCOLYTIC VIRUS DEALS

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Date	Source	Buyer	Deal type	Up-front ($m)	Note
May 2019	Transgene	Astrazeneca	Licensing	10	Five research candidates
Sep 2018	Viratherapeutics	Boehringer Ingelheim	Acquisition	245	VSV-GP project, preclinical
Feb 2018	**Viralytics**	**Merck & Co**	**Acquisition**	**394**	**Cavatak, phase II asset**
Nov 2017	Oncolytics	Adlai Norte	Licensing	5	Far East development of Reolysin
Oct 2017	Turnstone Biologics	Abbvie	Licensing	Undisclosed	Ad-MG1-MAGEA3, phase I/II asset
Dec 2016	Ignite Immunotherapy	Pfizer	Acquisition	Undisclosed	50% stake
Dec 2016	Psioxus	Bristol-Myers Squib	Licensing	Undisclosed	NG-348, preclinical asset
Dec 2016	Takara Bio	Otsuka	Licensing	Undisclosed	Japan rights to HF10
Nov 2016	Virttu Biologics	Sorrento	Acquisition	25 (equity)	Seprehvir, phase II asset
Jun 2016	Psioxus	Bristol-Myers Squib	Licensing	10	Enadenotucirev, phase I collaboration
Jun 2015	Oncos	Targovax	Acquisition	Undisclosed	Structured as a 50/50 merger
Jan 2015	Omnis	Astrazeneca	Licensing	Undisclosed	VSV project, phase II
Nov 2013	Jennerex	Sillajen	Acquisition	Undisclosed	$150m biodollar value
Jan 2011	Biovex	Amgen	Acquisition	424	Imlygic, approved for melanoma in 2015

Source: https://www.evaluate.com/vantage/articles/news/snippets/astrazeneca-doubles-down-oncolytic-viruses *Company statements.*

KEY CURRENT & EMERGING COMPETITION

Product	Target/Virus	Compar…uti	Development Phase …& Key Results
Oncorine	Squamous cell c… …of the head		Approved in China
Talimogene laherparepvec	Melan…		…USA
Pexa-Vec (JX-594)			Phase III
REOLYSIN	Squam…		Phase III
DNX-2401			Phase II
CAVATAK™			Phase II
ColoAd1			Phase I/II
SEPREHVIR		VIRTTU	Phase I/IIa
GL-ONC1	Ovarian… …ccinia	Genelux	Phase I

- Running out of IP
- Too expensive to deliver
- Poor efficacy

CF33 MANAGEMENT TEAM

IMUGENE
Developing Cancer Immunotherapies

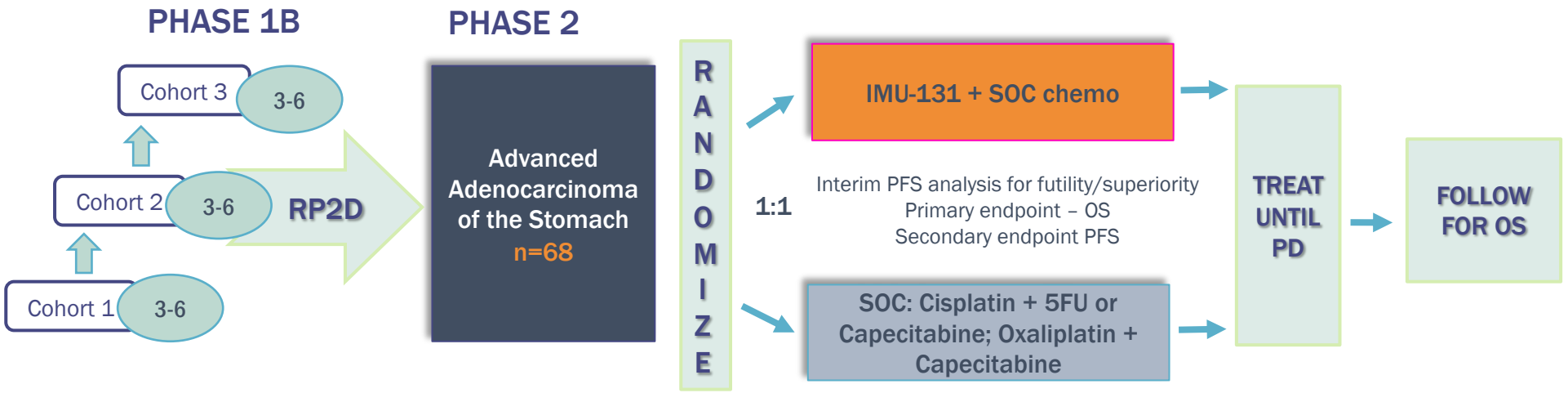
Paul Hopper
Executive Chairman

Leslie Chong
MD & CEO

Dr Nick Ede	**Dr Len Post** Senior Scientific Advisor	**Mark Grose** Clinical Trials Manager	**Dr Seymour Fein** Medical Monitor	**Dr Evan Siegal** IND Lead on Vaxinia IND Submission	**Dr Mike White** Biostatistician
CMC Expertise	Former Director Biovex	Former Clinical Trials Manager at Viralytics	Former Medical Monitor at Viralytics	Former IND Leader on Viralytics IND Submission	Former Viralytics Biostatistician
	Former Director Viralytics	Practical Clinical (Lisa Guttman and Leslie Guerreiro)			

Viralytics
Developers of Oncolytic Immunotherapies

HER-Vaxx PHASE 1B/2 STUDY DESIGN



Phase	Phase 1B	Phase 2
Indication	Newly diagnosed HER2+ gastric cancer	Newly diagnosed HER2+ gastric cancer
Endpoint	Safety & Tolerability, Immunogenicity, RP2D	Primary: OS, Secondary: PFS, Safety & Tolerability, Immune Response
No of Patients	up to 18	68
Site location	Asia, Eastern Europe, India	Asia, Eastern Europe, India

Completed

HER-Vaxx PHASE 1B: DESIGN & RESULTS

IMUGENE
Developing Cancer Immunotherapies

Trial

- HER2 Gastric or GEJ cancer
- Phase 1b
- Open label
- Dose escalation
- 14 sites in Asia and Eastern Europe

Patients

- Advanced stage IIIb or IV
- 7 HER2+++, 3 HER2++ (FISH positive), 4 HER2++ expressing tumors
- Age 57yo (21 - 79)
- ECOG 1(7) and 0(7)
- 9 Asian, 5 Caucasian
- 5 female, 9 male

Study

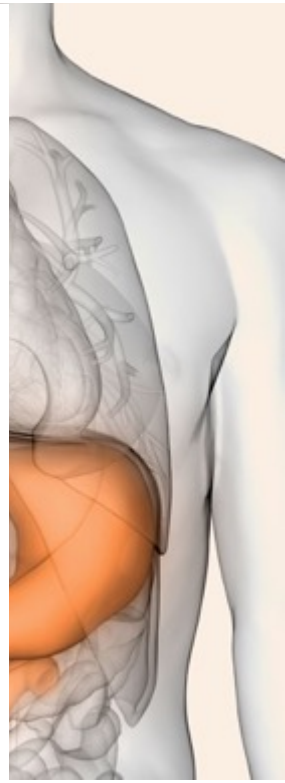
- 14 patients in 3 cohorts (10µg (3), 30µg (6) and 50µg (5)
- Dosed on D0, D14, D35
- IMU-131 in combination with chemo: cisplatin and 5FU or capecitabine

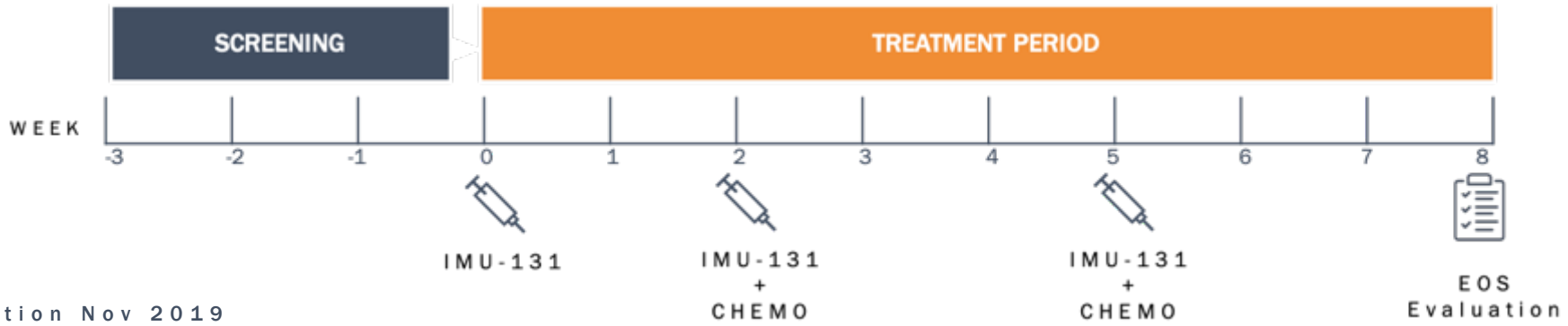
Endpoints

- Recommended Phase 2 Dose of IMU-131
- Safety and Toxicity
- Immunogenicity (anti-peptide (P467) and anti-HER-2 antibody titres)

Study Results

- No safety or toxicity issues
- All patients had increased antibody response
- 1 Complete Response
- 5 Partial Response
- 4 Stable Disease
- 1 Progressive Disease
- 50 µg selected as RP2D





GOING FORWARD: HER-Vaxx PHASE 2 COMMENCED

Trial

- Phase 2
- Open label
- Asia
- Eastern Europe
- India

Patients

- HER-2+++
- HER-2++ FISH/CISH +ve
- Advance or metastatic Gastric Cancer
- Stage IIIb/IV
- 68 patients in two arms

Study

Randomized
HER-Vaxx in combination with standard of care chemotherapy

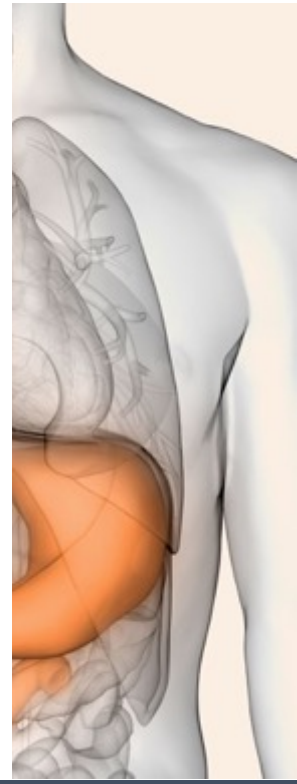
Or
Standard of care chemo: Cisplatin and 5FU or capecitabine or oxaliplatin

Primary Endpoints

- Overall survival

Secondary Endpoints

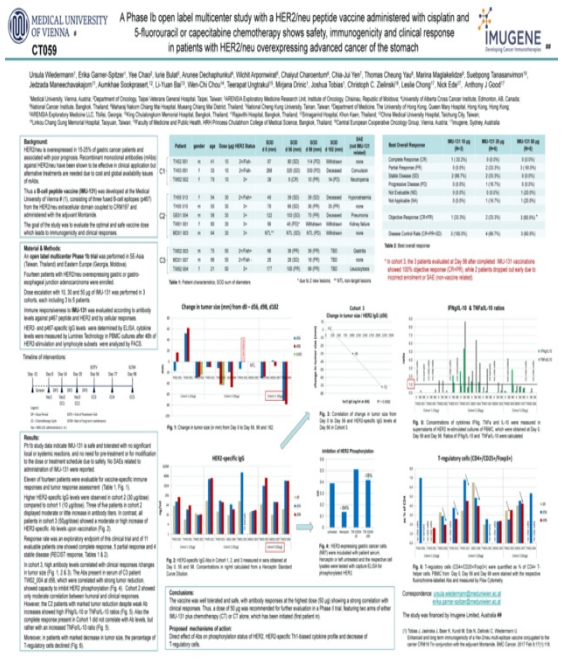
- Progression-free survival
- Safety and Tolerability
- Immune response



First patient dosed March 2019

HER-Vaxx PUBLICATIONS

AACR


A Phase Ib open label multicenter study with a HER2/neu peptide vaccine administered with cisplatin and 5-fluorouracil or capecitabine chemotherapy shows safety, immunogenicity and clinical response in patients with HER2/neu overexpressing advanced cancer of the stomach

CT059

[AACR 2019]

A Phase Ib open label multicenter study with a HER2/neu peptide vaccine administered with cisplatin and 5-fluorouracil or capecitabine chemotherapy shows safety, immunogenicity and clinical response in patients with HER2/neu overexpressing advanced cancer of the stomach

ESMO-GI

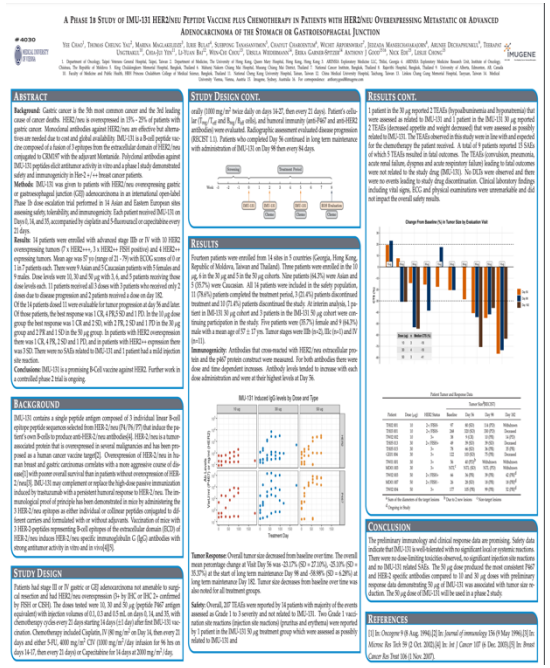

A Phase 1b Study of IMU-131 HER2/neu Peptide Vaccine plus Chemotherapy in Patients with HER2/neu Overexpressing Metastatic or Advanced Adenocarcinoma of the Stomach or Gastro-esophageal Junction

SO-304

[ESMO-GI 2019]

A Phase 1B study of IMU-131 HER2/NEU peptide vaccine plus chemotherapy in patients with HER2/NEU overexpressing metastatic or advanced adenocarcinoma of the stomach or gastroesophageal junction

ASCO


A Phase 1b Study of IMU-131 HER2/neu Peptide Vaccine plus Chemotherapy in Patients with HER2/neu Overexpressing Metastatic or Advanced Adenocarcinoma of the Stomach or Gastroesophageal Junction

4030

[ASCO 2019]

A Phase 1b study of IMU-131 HER2/NEU peptide vaccine plus chemotherapy in patients with HER2/NEU overexpressing metastatic or advanced adenocarcinoma of the stomach or gastroesophageal junction

ESMO


Comprehensive results of a Phase Ib study with a HER2/neu B-cell peptide vaccine administered with cisplatin and 5-fluorouracil or capecitabine chemotherapy show safety, immunogenicity and clinical response in patients with HER2/neu overexpressing advanced gastric cancer

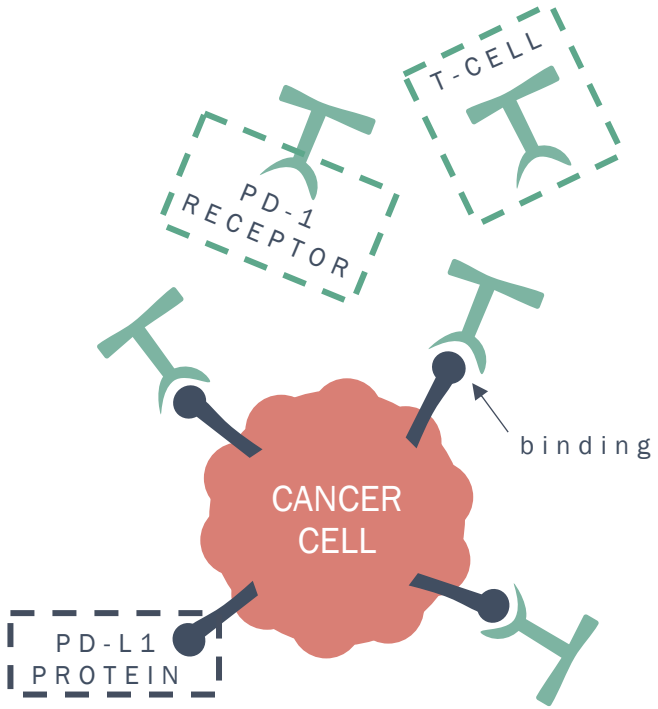
1212P

[ESMO-2019]

Comprehensive results of a Phase Ib study with a HER2/neu B-cell peptide vaccine administered with cisplatin and 5-fluorouracil or capecitabine chemotherapy show safety, immunogenicity and clinical response in patients with HER2/neu overexpressing advanced gastric cancer

HOW DOES PD1-Vaxx WORK?

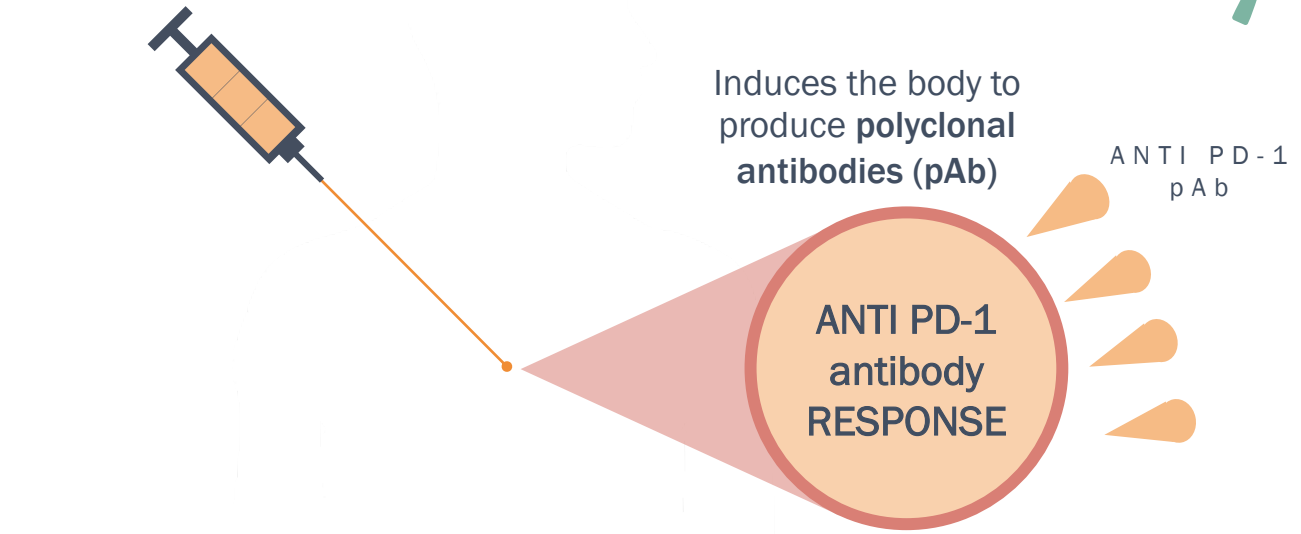
HOW CANCER STAYS UNDETECTED BY THE IMMUNE SYSTEM



The PD-L1 protein binds to the PD-1 receptor and stops the T-Cell from recognising the cancer cell, allowing the cancer cell to survive and spread

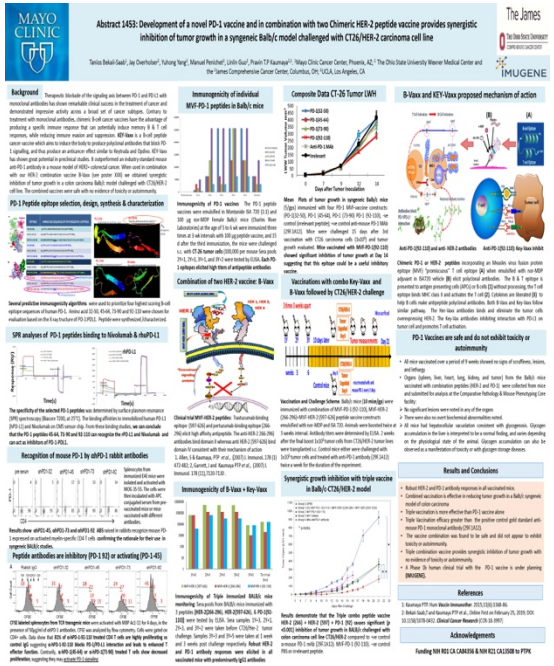
PD1-VAXX STOPS THE CANCER CELL FROM AVOIDING T-CELL RECOGNITION AND KILLING

Gives T-cells the ability to recognise the cancer cell and mount an immune response



PD1-Vaxx PUBLICATIONS

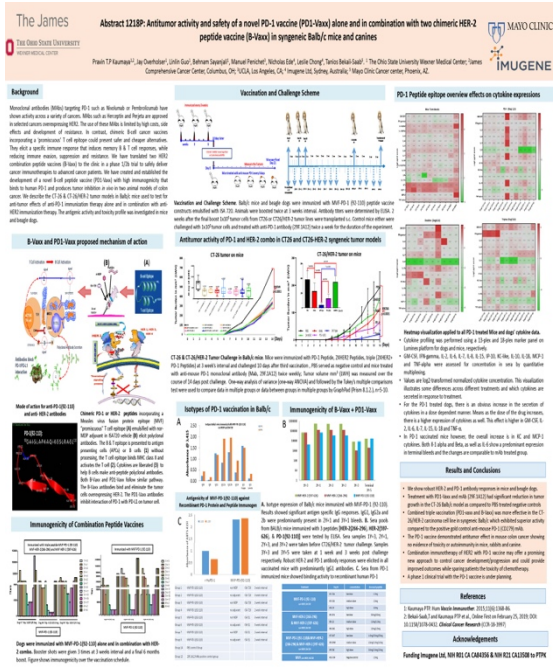
AACR



AACR 2019

Development of a novel PD-1 vaccine and in combination with two Chimeric HER-2 peptide vaccine provides synergistic inhibition of tumor growth in a syngeneic Balb/c model challenged with CT26/HER-2 carcinoma cell line

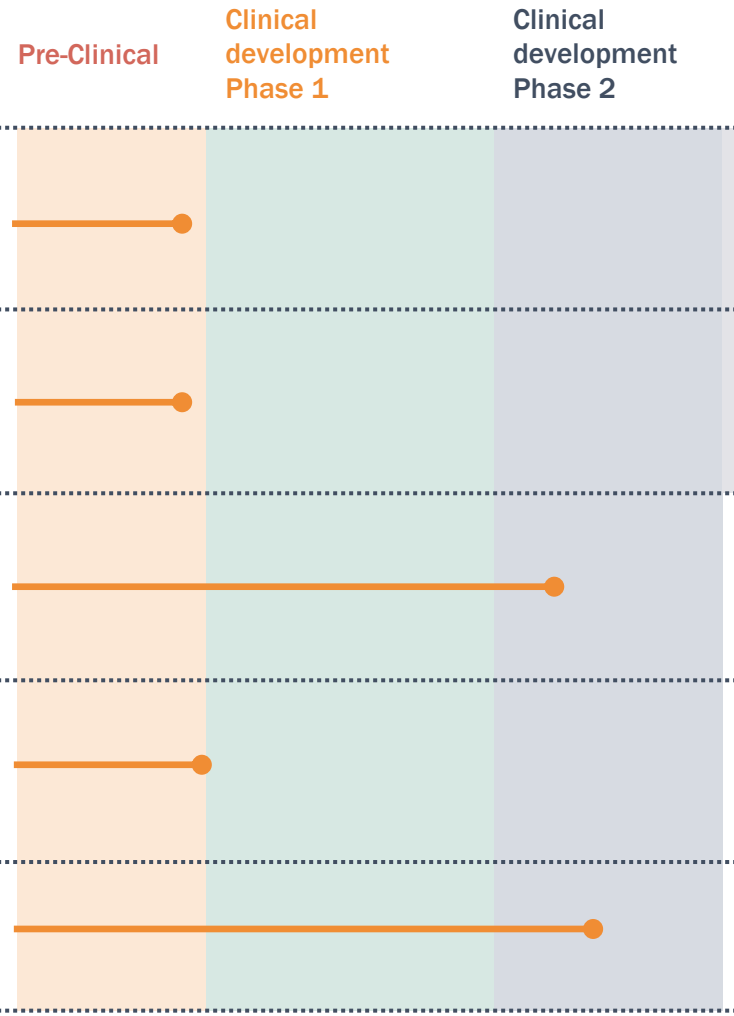
ESMO



ESMO-2019

Antitumor activity and safety of a novel PD-1 vaccine (PD1-Vaxx) alone and in combination with two chimeric HER-2 peptide vaccine (B-Vaxx) in syngeneic Balb/c mice and canines

IMUGENE HAS A DEVELOPING PIPELINE



	Key Data / Results	Key IP patents
Vaxinia (CF33)	• CF33 has shown strong anti tumour responses in preclinical studies • Inhibition of tumour growth in nearly all NCI60 models in TNBC, Lung, Pancreatic etc. • Signs of increased tumour growth inhibition with CF33 + anti PD-L1	Intellectual property patents expiring 2037
CheckVacc (CF33 & aPD-L1)	• Pre-clinical studies showed cancer growth inhibition was better than compared to Amgen or Genelux oncolytic virus. • Potentially solves the industry problem of additive toxicity of combined checkpoint inhibitors if safety of CF33 is maintained in combination	Intellectual property patents expiring 2037
HER-Vaxx (HER-2)	• Successful completion of Phase 1b trials • Strong trial results with no safety or toxicity issues • All patients had increased antibody response • 11/14 evaluable patients with encouraging clinical responses	Intellectual property patents going out to 2036
PD1-Vaxx	• PD1-Vaxx has shown encouraging response in preclinical studies • Strong inhibition of tumour growth in mouse models of colorectal cancer (outperformed industry standard mouse PD-1 mAb) • Signs of increased tumour growth inhibition when co-administered with B-Vaxx	Intellectual property patents expiring March 2037 & February 2038
B-Vaxx (HER-2)	• Positive Phase 1 results and now currently in phase 2 • B-Vaxx is fully funded by OSU grant • 14/24 evaluable late stage patients with encouraging clinical response	Intellectual property patents expiring April 2027 & August 2030

MULTIPLE VALUE REALISATION PATHWAYS

SALE OF COMPANY

OR

PARTNER WITH BIG PHARMA

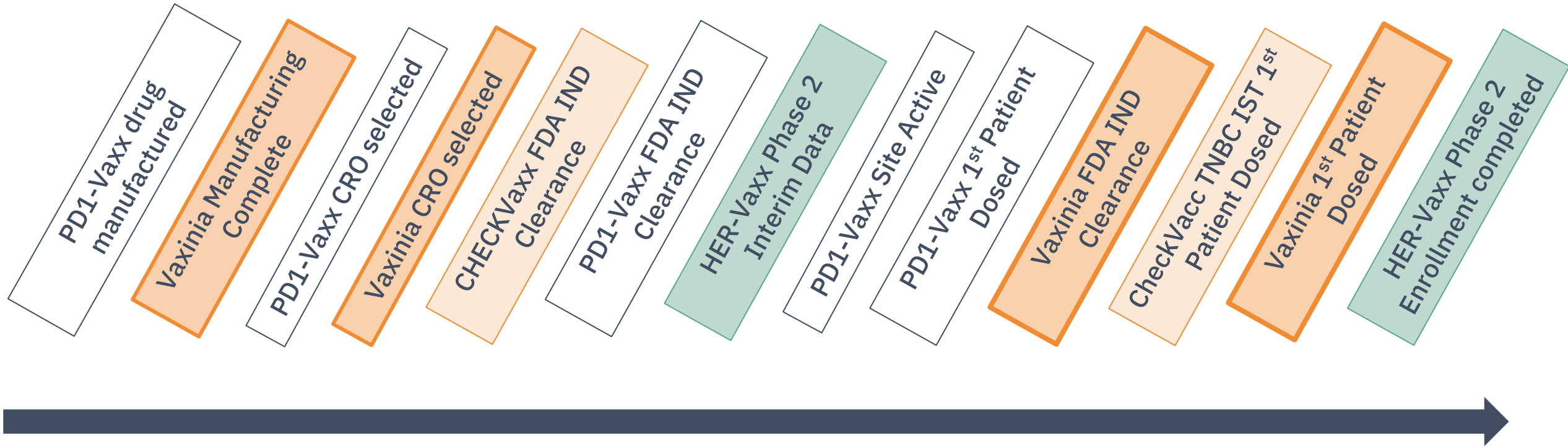
OR

LICENSE A TARGET DISEASE

OR

DEVELOP INDEPENDENTLY

MULTIPLE NEAR & MEDIUM TERM VALUE INFLECTION POINTS



Next 12 months

Financial Summary

Public Market Overview

Share Price [1]	A$0.023
Market Capitalisation [2]	A$83.1M
Cash equivalents (30 Sep 19 + R&D rebate)	A$17.8M
Enterprise Value	A$65.3M

Top 5 Shareholders (as at October 2019)

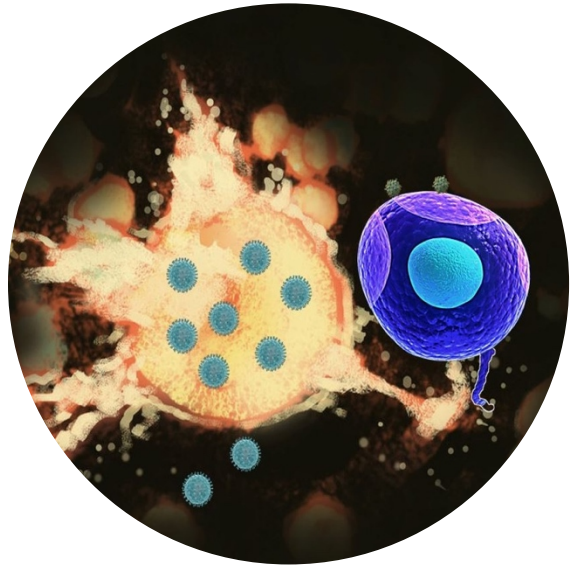
National Nominees Limited	5.6%
Dr. Nicholas Smith	3.3%
Paul Hopper	2.1%
HSBC Custody Nominees (Australia)	1.8%
Sarah Cameron	1.7%

Note:
1. As of 29 October 2019
2. Market capitalization calculations based on ordinary shares (3.61bn) only and excludes the dilutive impact of options outstanding (652m)

Share Price Performance (last 6 months)

INVESTMENT HIGHLIGHTS

- Novel technology in one of the most sought-after areas of cancer immunotherapy today: oncolytic viruses a.k.a. cancer killing viruses that stimulate immune recognition of cancer & our B-cell Immunotherapy pipeline
- CF33 poised to enter into 2 x Phase 1 clinical trials in 2020; PD1-Vaxx to enter into phase 1 study in 2020
- Robust intellectual property: long patent life & composition of matter for CF33 to 2037 and HER-Vaxx to 2036
- Highly experienced immunotherapy developers including the oncolytic virus team (all ex-viralytics)
- Potential applications across many cancers, including combination with CTLA4/PD-1/PD-L1 checkpoint inhibitors or with engineered immune cells
- Outstanding scientific provenance across all our technology: B-cell immunotherapies from Medical University of Vienna and OSU & CF33 from one of the US leading cancer centres, City of Hope in Los Angeles with Inventor, Professor Yuman Fong who is an internationally recognized oncolytic virus and cancer expert
- Attractive license terms - worldwide exclusive rights to the technology



IMUGENE
Developing Cancer Immunotherapies

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