



NOVEL ONCOLYTIC CANCER VIRUS

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
- Poised to enter Phase 1 clinical trials in early 2020
- Two batches GMP Phase 1 virus material near completion, additional GMP Phase 1 virus material with anti-PD-L1 completed.
- Robust intellectual property- long patent life & composition of matter to 2037
- Highly experienced oncolytic virus team to join Imugene, 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 from one of the US leading cancer centers,
- City of Hope in Los Angeles with Inventor, Professor Yuman Fong, is an internationally recognized oncolytic virus and cancer expert
- Attractive license terms - worldwide exclusive rights to the technology
- Intense interest in oncolytic viruses from Big Pharma with over \$1.0B in three acquisitions in 2018, including Viralytics

The Technology

Oncolytic viruses are naturally occurring, or genetically modified viruses that infect, replicate in and eventually kill cancer cells while leaving healthy cells unharmed.

Our lead candidate is a chimeric vaccinia (pox) virus known as **CF33**, developed by Professor Yuman Fong, at the prestigious City of Hope Comprehensive Cancer Center in Los Angeles, California.

Vaccinia is a genetically stable double stranded DNA virus of the Poxviridae family. It has a track record of safe use in millions of humans as it was the active constituent of the vaccine that eradicated smallpox, one of the most devastating diseases known to humanity and was the first oncolytic virus demonstrating viral oncolysis in the laboratory in 1922.

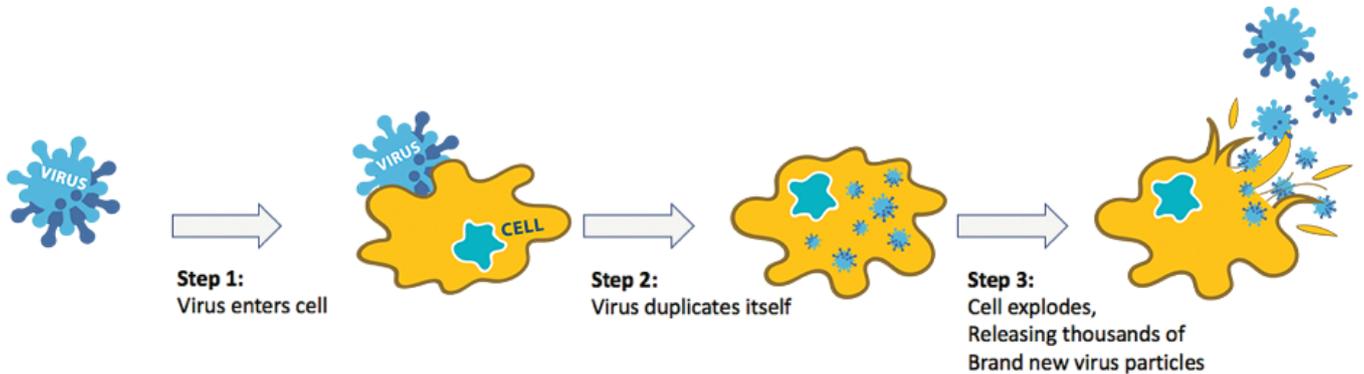
Vaccinia has a short well characterised life cycle and spreads rapidly from cell to cell, but does not integrate into the host's genome. It is highly cytolytic for a broad range of tumor cell types. It has the potential to act as both a gene therapy delivery vehicle and oncolytic agent.

CF33 is a combination of genomic sequences from multiple vaccinia virus strains to generate a new, safer and more potent virus. **CF33** is two genes, Human Sodium-Iodide Symporter (hNIS) to enable imaging to track the virus in vivo and mediate targeted radiotherapy, as well as anti PD-L1 to enable enhancement of anti-cancer immunotherapy. We have both **CF33** candidates; **CF33** with aPD-L1 and **CF33** without engineered aPD-L1 for development.

Safety has been demonstrated in a number of pre-clinical trials and there is evidence for both a local and systemic anti-tumor response.

Through the use of **CF33**, we hope to improve the clinical benefits and quality of life for patients with cancers that are difficult to treat using current therapeutic approaches.

How a virus kills a cell:



Experienced leadership team with recent success at Viralytics



Executive Chairman & Founder: Paul Hopper

Over 25 years experience in the medical, healthcare & life sciences sectors. Focused on start-up and rapid growth companies, he has served as either Founder, Chairman, non-executive director or CEO, of more than fourteen companies in the US, Australia and Asia. Previous Boards include Chairman of oncolytic virus immunotherapy company Viralytics (acquired in June 2018 by Merck for A\$502M), pSivida, Polynoma, Somnomed, & Fibrocell Science. Current positions include: Founder and Executive Chair Imugene, Founder and Director Prescient Therapeutics, Founder and Executive Chair of BioScience Oncology.



Scientific Founder: Professor Yuman Fong

A pioneer both in the operating room and in the laboratory, Yuman Fong, M.D., The Sangiacomo Family Chair in Surgical Oncology and chair of The City of Hope Department of Surgery is an internationally recognized expert in cancer of the liver, pancreas, gallbladder and bile ducts. He has led the research effort to employ 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 developed many new surgical techniques and instruments, written and edited hundreds of scholarly articles as well as nearly a dozen textbooks.



City of Hope

City of Hope 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.

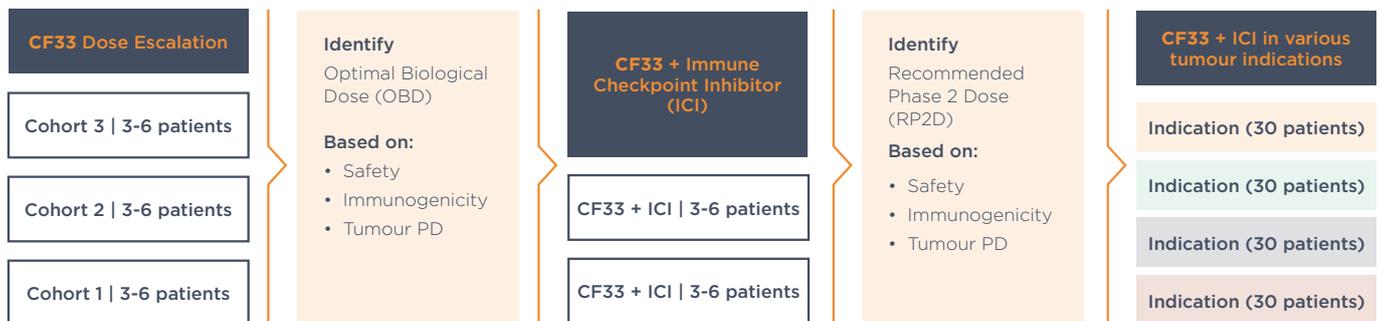
City of Hope is also a founding member of the National Comprehensive Cancer Network, with research and treatment protocols that advance care throughout the US. City of Hope has been ranked as one of the nation's "Best Hospitals" in cancer by U.S. News & World Report for over 10 years.

What are the Advantages of CF33 virus?

Preclinical data has demonstrated that the **CF33** virus is more efficacious than all parental viruses and some viruses in clinical trials. Especially impressive is that **CF33** can shrink multiple types of cancer at an extremely low dose (1000 PFU). Importantly, **CF33** shrinks not only injected tumours, but also non-injected distant tumours (abscopal effect).

CF33 Proposed Phase 1 / 2 Clinical Development Plan

Phase 1 – Dose Seeking/Signal Finding



Oncolytic Virus Scientific Advisors



Professor Ulrich Lauer

Head of Virotherapy Research bei University of Tuebingen Germany.

Prof. Lauer is also Head of the German Oncolysis Consortium (GOC). From 2012-2014 Prof. Lauer carried out the first German clinical virotherapy trial employing a recombinant oncolytic virus.



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.



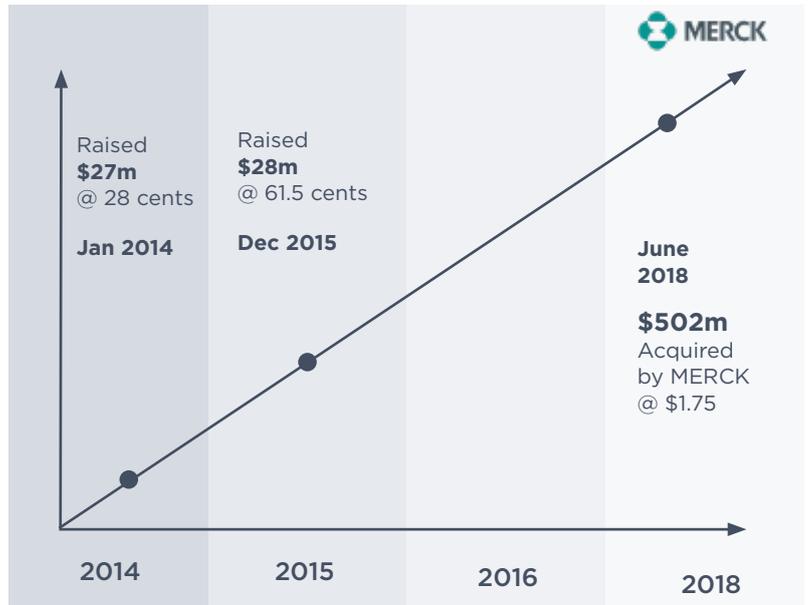
Professor James Market

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.

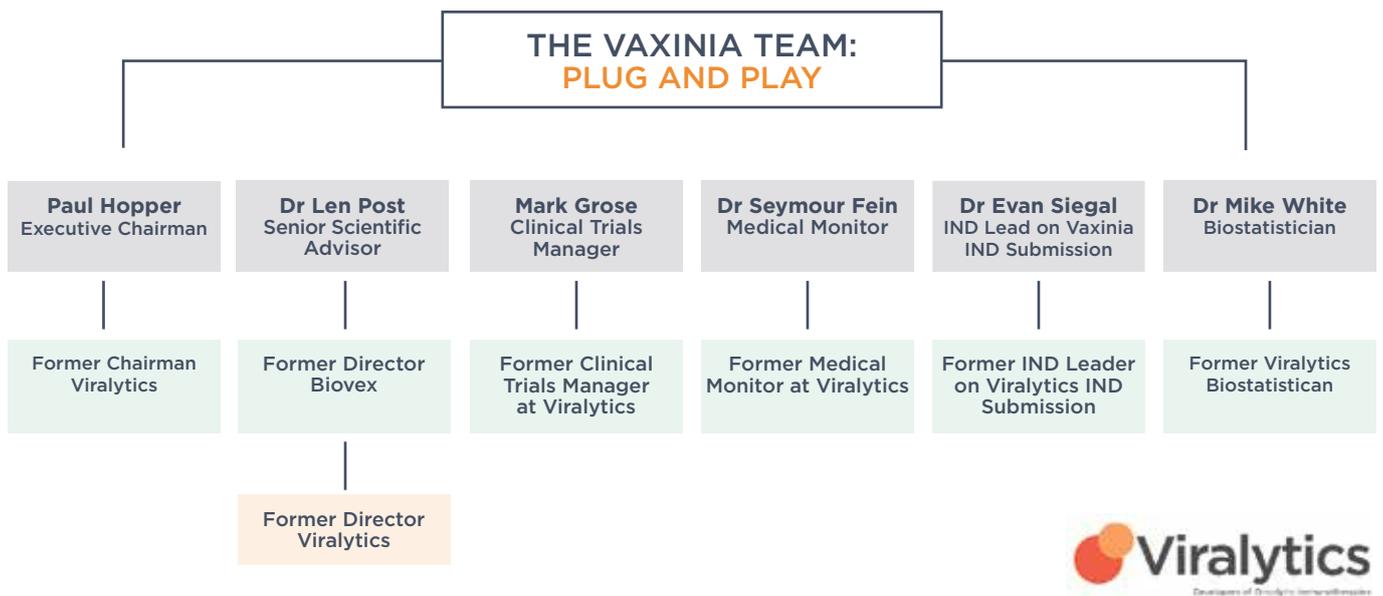


Viralytics Case Study: Acquired by Merck for \$502million

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



Highly experienced oncolytic virus team to join Imugene, all ex-Viralytics



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