

Fast-tracking more effective treatments for aggressive and lethal brain cancers

Project Title	ACRF BRAINSTORM Program
Lead Institute	WEHI, VIC
Focus Area	Accelerating the development of innovative brain cancer therapies for high-grade gliomas
Cancer Types	Brain cancers

Challenge and Opportunity

Despite decades of research, high-grade gliomas remain among the deadliest brain cancers, with limited treatment options and survival rates that have barely improved in 20 years. Current technologies have been unable to crack the complexity of these tumours and deliver effective treatments, highlighting how pivotal investments into cutting-edge tools and approaches are for progressing brain cancer research.

By harnessing the latest advances in imaging, cell therapy, and data-driven science, the ACRF BRAINSTORM Program hopes to reverse the poor survival rates currently seen in high-grade glioma patients and help create a future where patients have access to the personalised treatments needed to better fight this aggressive disease.



In 2024 there were 1,600 deaths to brain cancer in Australia alone.

(Cancer Australia)

Dr James Whittle in the laboratory, Chief Investigator

Project in Brief

The BRAINSTORM program is a landmark Australian initiative aiming to accelerate the development of new therapies for an aggressive and lethal form of brain cancer: **high-grade gliomas (HGGs)**.

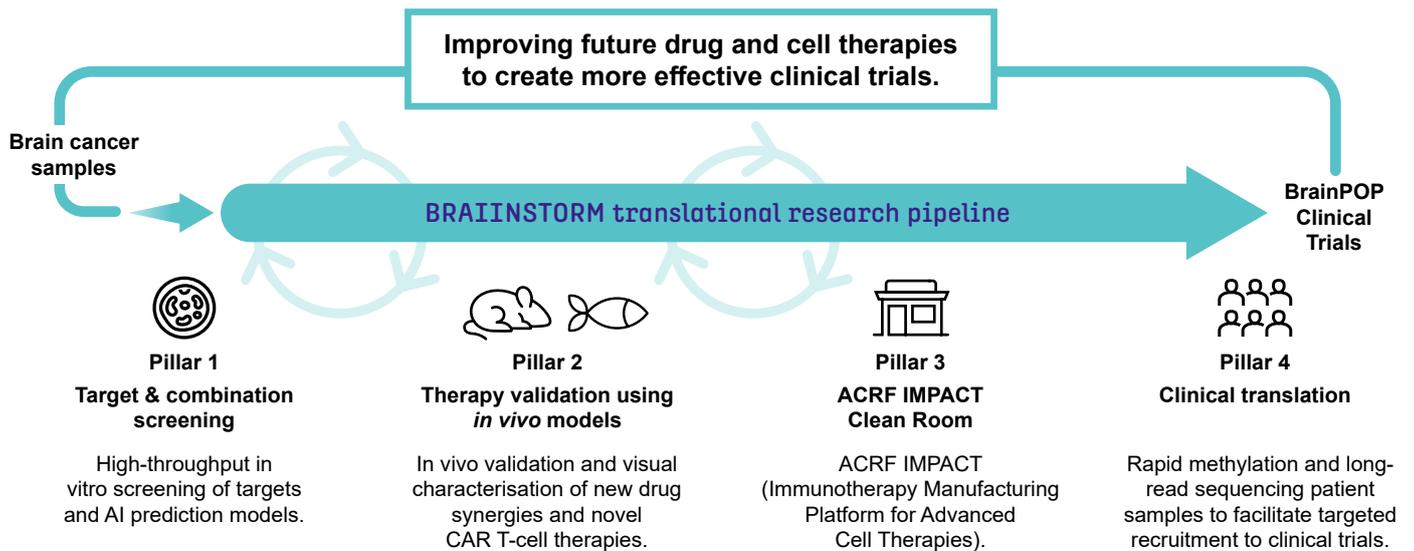
In children, brain cancers remain the leading cause of childhood cancer death in Australia. The most common form of high-grade glioma is **diffuse intrinsic pontine glioma (DIPG)** – the deadliest tumour type. In adults, **glioblastoma** accounts for 65% of all brain cancer deaths and remains without effective long-term treatment.

BRAINSTORM will establish an end-to-end translational pipeline to **accelerate the development of innovative therapies** for brain cancer by combining cutting-edge technologies – like artificial intelligence and immunotherapy – with discovery science, advanced engineering, and clinical expertise.

BRAINSTORM stands for *BRinging AI and Immunotherapy for Neuro-oncology together; using Screening, Therapies and Omics-based Research Models* – a name that reflects its mission to tackle one of the most complex and devastating cancers through collaboration and innovation.

By investing in this cancer research infrastructure, we will establish one of Australia’s most comprehensive translational pipelines for high-grade gliomas which could lead to desperately needed new treatments for the aggressive disease.

This could improve patient outcomes for this notoriously difficult-to-treat cancer, through the development of personalised drugs and cell therapies and establishment of a translational pipeline spanning discovery to first-time-in-human clinical trials.



“BRAINSTORM is a landmark initiative because it will spearhead new treatments for HGGs. The program combines cutting-edge cell therapies with data-driven strategies to overcome the complexity and resistance of brain tumours”.



Professor Misty Jenkins AO and Dr James Whittle, Chief Investigators

The Benefit

The hope is for brain cancer patients to benefit from more targeted and effective therapies, including tailored combinations of drug treatments.

The BRAINSTORM Program is closely integrated with the Brain Perioperative Program (BrainPOP) – a world-first clinical trial platform led by The Brain Cancer Centre and research partners WEHI, The Royal Melbourne Hospital (RMH), Peter MacCallum Cancer Centre, The Royal Children’s Hospital and the University of Melbourne.

This collaboration is a crucial step towards better personalised treatments for brain cancer, enabling clinicians to study a patient’s unique cancer as soon as it can be accessed from the operating room. This has the potential to transform patient outcomes and accelerate precision medicine in brain cancer care.

Due to the universally poor prognosis of high-grade gliomas, finding new ways to improve patient and treatment outcomes is the focus of this project. The new clean room infrastructure can be accessed and applied to all cancers.

This infrastructure investment will build long-term capacity for innovation and strengthen Australia’s position as a global leader in cancer research.



“One of the things that makes this project very exciting is it’s not just a single project and it’s not a single therapy. It’s building a platform that goes all the way from AI-driven target discovery through to clinical trials in one place in Australia.

Professor Misty Jenkins and Professor Ken Smith (Director of WEHI), being awarded their ACRF Grant, 2 December 2025

Right now, we don’t have cell therapy clinical trials in Australia. And it’s really important for us to be able to manufacture our own therapies and bring these personalised cutting-edge treatments to Australian patients.”

Professor Misty Jenkins AO



Professor Misty Jenkins AO with researchers at WEHI.

Use of Funds

Several pieces of equipment and technology will result in:

- Enhanced Novel CAR T-cell design and development.
- High-Resolution in vivo imaging and tissue clearing for therapy validation.
- Establishment of a scalable CAR T-cell manufacturing platform to support early-phase clinical trials for high-grade gliomas.

Technology	Cost
Therapeutic discovery	
AI Amazon GPU compute (drugs)	\$100,000
AI Amazon GPU compute (immunotherapy)	\$100,000
Pre-clinical screening platform	
Fontus mini	\$132,370
Class II Type B2 Biosafety Cabinet (Fontus)	\$58,000
Pre-clinical intracranial vertebrate models	
Zeiss Z1 Lightsheet Microscope upgrade	\$100,000
Zeiss Z1 Data Storage (100TB)	\$100,000
IVIS Spectrum 2	\$450,000
Clinical CAR T-cell manufacture	
Clean Room Equipment	\$110,000
iCELLis™ Nano bioreactor system (Virus Production)	\$190,330
CliniMACS Plus Instrument	\$220,000
CliniMACS Prodigy	\$445,000
Tube welder	\$49,000
Maxcyte GTX	\$245,300
Clinical sequencing for patient recruitment	
ONT P2 integrated	\$200,000
Total	\$2,500,000

Meet the Team of Chief Investigators



**Co-Lead: Professor Misty Jenkins
AO, BSc (Hons) PhD, FTSE**
Laboratory head in the Personalised Oncology Division at WEHI and leads the Immunotherapy Program for the Brain Cancer Centre (BCC).



**Co-Lead: Dr James Whittle,
MBBS, PhD**
Neuro Oncologist and clinician scientist with deep expertise in translational research and early-phase clinical trials. Lead of the Neuro Oncology service at Peter Mac and co-head of the Brain Cancer Research Lab at WEHI.

Professor Paul Beavis, PhD

Group Leader at the Peter MacCallum Cancer Centre and a leading expert in CAR T-cell therapy and cancer immunology.

Dr Sarah Best, PhD

VCA Mid-Career Fellow and Laboratory Head of the Brain Cancer Research Laboratory (WEHI, BCC)

Dr Ryan Cross, PhD

Mid-career leader bringing to the forefront a blend of specialised knowledge in immunotherapy, and a proven track record of innovation in the field of Chimeric Antigen Receptor (CAR) T-cell therapies.

Professor Stephen Fox, PhD, MBChB, FRCPath, FRCPA, FAHMS

Director of Pathology at the Peter MacCallum Cancer Centre and a leading molecular pathologist with extensive expertise in cancer diagnostics, biomarker development, and translational oncology.

Dr Saskia Freytag, PhD

Mid-career laboratory head at the Brain Cancer Research Laboratory (WEHI, BCC), focussed on glioma heterogeneity and treatment targets using advanced multi-omics.

Professor Ben Hogan, PhD

Group Leader at the Peter MacCallum Cancer Centre and an internationally recognised vascular biologist whose research explores on the blood-brain barrier (BBB) and its role in brain cancer.

Professor Guillaume Lessene, PhD

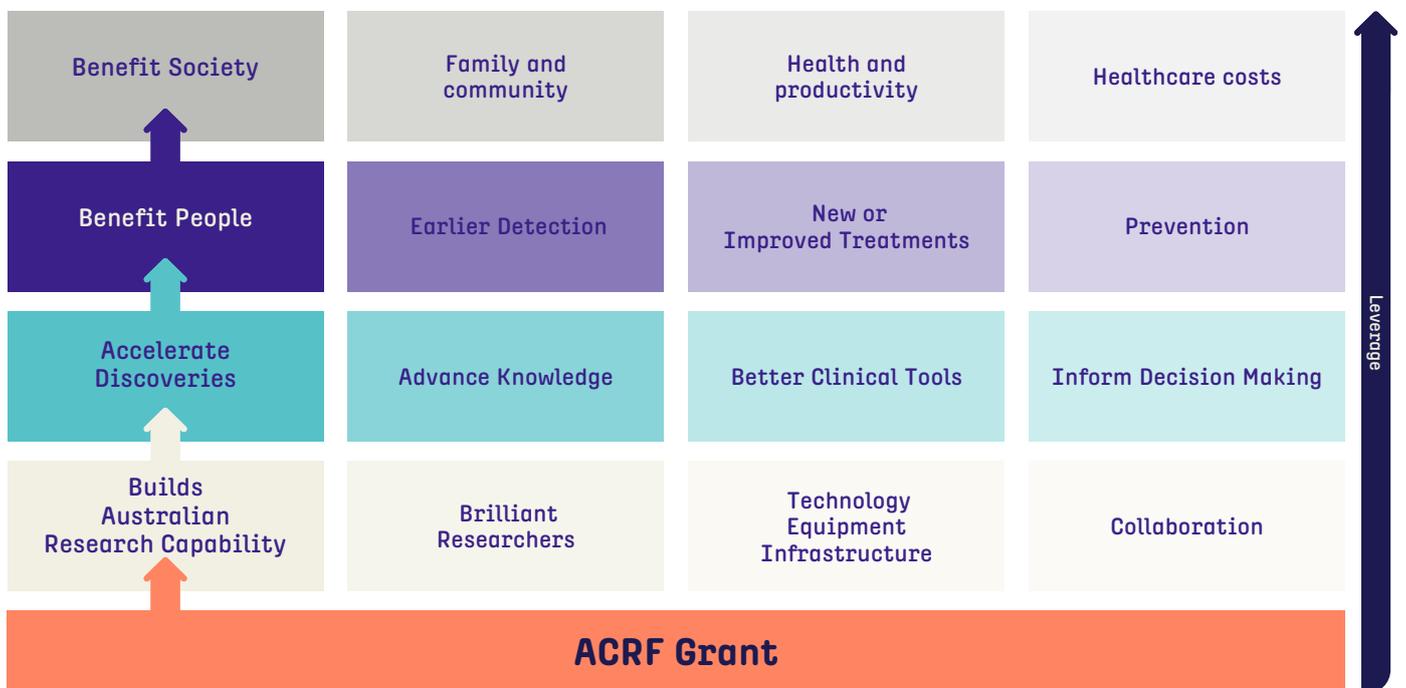
Associate Director of Therapeutics Discovery at WEHI and Head of the new Medicines and Diagnostics Division. He is a leader in academic small molecule drug discovery to enable the translation of groundbreaking science into first-in-class therapeutics.

Professor Kelly Rogers, PhD

Head of the Advanced Technology and Biology Division and a Laboratory Head at WEHI, internationally recognised for her expertise in advanced microscopy and in vivo imaging.

ACRF's approach accelerates impact

- ACRF is uniquely positioned to access brilliant researchers and facilitate collaboration across Australia. Our focus on equipping researchers with technology and infrastructure is vital to progress and innovation.
- An outstanding independent panel of Australian and international cancer experts recommended funding this project. The research is cutting edge, distinctive, and has the potential for impactful outcomes.
- Projects outcomes will be reported to ACRF for seven years. These typically include scientific breakthroughs, advanced knowledge, publications, new approaches both in the clinic and use of information.
- The impact for people affected by cancer – through earlier detection, new and improved treatments – is better quality of life through the diagnosis, and lives saved. In some cases, research even results in preventing cancer.
- Furthermore, research benefits society – including keeping families and communities intact, reducing healthcare costs and keeping people healthy and productive.



ACRF seed funds remarkable projects and recipients typically leverage the ACRF grant to secure funding from other funding agencies. Reports from 33 grants (2013 – 2023) with an award total of \$80 million evidence self-reported leverage to \$778 million, a factor of 9.6 times.

Beyond the primary research objectives ACRF funded equipment has been used in the training of numerous new doctors and scientists, and it has played a part in attracting and retaining leading talent in Australia and global acknowledgement of the high quality of Australian cancer research.

**B A C K I N G
B R I L L I A N T**

To find out more about Australian Cancer Research Foundation, the ACRF Accelerate program and this exciting project please contact philanthropy@acrf.com.au 1300 884 988