

**Queensland Brain Institute**  
Clem Jones Centre for  
Ageing Dementia Research



# Ageing Well - Pioneering ageing and dementia therapies



## THE NEED

Every three seconds, someone in the world develops dementia. Almost half a million Australians live with dementia, and this figure is expected to grow exponentially by 2050. Now Australia's second biggest killer, it rivals cancer as the most feared health condition in the nation. Recognising the growing challenge posed by Alzheimer's disease and other dementias, the World Health Organisation (WHO) has declared this the Decade of Healthy Ageing (2021-2030). The global response is on to find new and effective therapies. As one of the top brain research institutes in the Asia-Pacific region, the Queensland Brain Institute (QBI) at The University of Queensland, is making major inroads in understanding its causes and new ways to treat this mounting disease.

## CJCADR

QBI established the Clem Jones Centre for Ageing Dementia Research (CJCADR) in 2012, with vital support from philanthropic partners including the Clem Jones Foundation, to focus its research on understanding dementia and identifying treatments. 2022 marks a decade of excellence and fundamental discoveries from a world-class community of experts who have shone new light on the causes of dementia and inspired potential new therapies.

## THE GOAL

*Understanding the mechanics of the brain to drive new therapies for ageing and dementia and improve the brain's resilience.*

### Case study: Therapeutic Ultrasound

*Translating discovery research to clinical application*

CJCADR Director Professor Jürgen Götz and his team have developed a ground-breaking therapeutic ultrasound approach to target dementia. This program of research builds from the breakthrough discovery published in 2015 that low-intensity ultrasound can clear the toxic amyloid-beta plaque build-up that is the hallmark of Alzheimer's disease.

The key objective of the Scanning Ultrasound Research Program is the development of a non-invasive and portable ultrasound therapy for the treatment of Alzheimer's disease and other brain disorders in outpatient settings.

The team has developed and fabricated the UltraThera<sup>Pilot</sup> trial-ready medical device, and has commenced a clinical trial to determine whether scanning ultrasound is safe in Alzheimer's disease patients. The trial is currently recruiting and will run throughout 2023.

The team's pre-clinical research has significantly advanced understanding of ultrasound's various mechanisms of action. The team has identified several ultrasound methods for a range of potential applications, including delivering novel drugs – such as the antibody and nanoparticle therapeutics that the team is also developing.

UltraThera<sup>Pilot</sup> has been constructed as a platform device into which the next generation technologies, under development by the CJCADR research team, will be built and tested. The intention is to modify disease progression and ultimately prevent and cure brain diseases.

The therapeutic ultrasound field is booming internationally and competition to develop successful ultrasound therapies is strong. The CJCADR team is widely recognised internationally as a leader in the field.



As CJCADR's ultrasound device commercialisation progresses, pre-clinical research will continue in tandem to bring the next phase technologies and applications online. This includes tailoring ultrasound treatments in line with personalised medicine; to select the ultrasound parameters, the therapeutic agents, and the target brain tissues to optimise treatments for each individual's particular disease state.

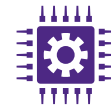
Therapeutic ultrasound is a breakthrough technology with immense potential to improve health and wellbeing. The progress to date demonstrates CJCADR's capability and capacity to make leading-edge research discoveries and take them from lab to life.



PIONEERING  
DISCOVERIES  
POISED FOR  
**HEALTHCARE  
IMPACT**



**10**  
RESEARCH  
LABORATORIES



USING  
**CUTTING-EDGE  
TECHNOLOGIES**  
TO FAST-TRACK  
RESEARCH OUTCOMES



**70**  
RESEARCHERS



BUILDING A  
**STATE-OF-THE-ART  
RESEARCH CENTRE**  
DEDICATED TO AGEING  
AND DEMENTIA



**30**  
PHD STUDENTS



TAKING POTENTIAL  
NEW THERAPIES FROM  
**BENCH TO  
BEDSIDE**



MORE THAN  
**300**  
PEER REVIEWED  
PUBLICATIONS



WORLD-LEADING  
NEUROSCIENCE  
RESEARCH AND  
**PATENT  
PORTFOLIO**

*The World Health Organisation has declared this decade (2021-2030) as the Decade of Healthy Ageing in a global effort to advocate for ageing well.*

CJCADR started small and has grown to assemble an elite cohort of internationally recognised researchers with diverse and complementary expertise. With its cutting-edge technologies, the Centre now boasts expertise in medical imaging, super-resolution microscopy, research super-computing and big-data analysis, as well as molecular and cellular technologies in gene-editing, biochemistry, histology, transcriptomic and proteomic analyses. CJCADR researchers work with a range of model species including worms, mice and sheep, as well as human study participants. The Centre runs a program of community engagement to involve stakeholders and participants in its research and the complexity of brain health.

The Centre's capability, facilities and track-record position it as a world-leader within the highly competitive international dementia research landscape. Over its first 10 years, CJCADR has educated the

world on the biological progression of dementia and demonstrated its ability to take novel discoveries and develop them toward clinical translation. More is possible and our next breakthrough discovery is only a matter of time.

Australia's ageing population is poised to have life-changing impacts on individuals and their carers as the emotional and financial burden of disability across the community widely escalates. A seismic shift is required to effectively manage the next wave which can only come with research. Research which will help people age well, live longer with dignity, and improve the lives of millions of Australians living with dementia and other brain disorders.

As we near 2024, QBI seeks to raise \$25 million from government and philanthropic sources to continue CJCADR's leading research to advance understanding of the brain and better support Australians to age well.

## From Lab to Life - 2024-2028

