

2022/2023 Research Update

QBI Clem Jones Centre for Ageing Dementia Research



Dementia Research at QBI

Clem Jones Centre for Ageing Dementia Research



2022 marked ten years since the establishment of QBI's Clem Jones Centre for Ageing Dementia Research (CJCADR) and provided an opportunity to celebrate 10 years of discovery and research excellence. This important milestone highlighted the Centre's many successes over the past decade. The success of CJCADR has been made possible through the vision of UQ, Government, the Clem Jones Foundation and of course you, our generous donors. In commemorating this anniversary, CJCADR reflected on the legacy inspired by Dr Clem Jones AO and Mrs Sylvia Jones that remains our commitment, to be bold, daring, adventurous and inspiring in our pursuit of discovering the unknowns of dementia.

In February 2023, QBI announced Professor Jürgen Götz as the Lesleigh Green — Bill and Nancy Green Chair in Dementia Research Endowed Chair. This is QBI's first endowed chair and was created through an estate gift to charity from the late Ms Lesleigh Spencer Thomson (nee Green) who was diagnosed with Alzheimer's in August 2012 before passing away.

Looking ahead to the next decade, our talented team at CJCADR is optimistic about the opportunities for their research to contribute important knowledge and improve the outcomes for people living with dementia. Each of us, having lived through a global health crisis, can fully appreciate the importance of teamwork, something the Clem Jones Centre for Ageing Dementia Research began a decade ago — and we look forward to the next decade with renewed confidence.

QBI celebrates its 20 Year Anniversary this year. Neuroscience discoveries are often a long time in the making and require enormous investments in time and resources, but ultimately, they have the potential to improve millions of lives. This inspires our work.

QBI's dementia research is leading the way in the global hunt for a cure and is only possible because donors, like you, and others including The Clem Jones Foundation, The Brazil Family Foundation, The McCusker Foundation, Stafford Fox medical Research Foundation and The Terry and Maureen Hopkins Foundation have joined with us in this fight.

Thanks again and we hope you enjoy this brief update on our incredible research progress.

2022/2023 CJCADR Research Highlights

CJCADR researchers have maintained research momentum into 2023 with 43 peer reviewed journal articles published in high-impact journals. Following are some highlights that demonstrate the breadth of the Centre's research and the calibre of findings being published.

- **Professor Juergen Gotz** and **Dr Daniel Blackmore** illustrated how focused ultrasound (FUS) may be employed to revolutionise the treatment of a wide range of neurological disorders, providing non-invasive, targeted therapies that can improve patient outcomes and quality of life.
- **Professor Frederic Meunier** and **Dr Ramon Martinez-Marmol** published important research which is unravelling the molecular mechanism of Lion's Mane mushroom compounds and their effects on brain function, boosting nerve growth and enhancing memory.
- **Professor Elizabeth Coulson** from QBI and School of Biomedical Sciences discovered a causal relationship between a lack of oxygen to the brain during sleep and Alzheimer's disease in mice. This demonstrates that hypoxia — when the brain is deprived of oxygen — causes the same selective degeneration of neurons that characteristically die in dementia. Ultimately, CPAP treatment of obstructive sleep apnoea has the potential to reduce dementia risk.



"Philanthropic donations supporting Dementia research in our lab have enabled us to design a pipeline for testing natural products using novel technologies. I am excited to say that we have now a fully automated pipeline using one of our super-resolution microscopes to test compounds. Our plan is to isolate and synthesise some of these molecules to derive much needed drugs for the treatment of dementia."

— Professor Fred Meunier

- **Professor Frederic Meunier** and **Dr Ramón Martínez-Mármol's**, research has revealed that the clean-up of cellular 'protein clumps' could prevent the onset of some types of dementia. The discovery was made after focusing on the relationship between the enzyme Fyn and the protein Tau in frontotemporal dementia.
- **Dr Pranesh Padmanabhan**, revealed newly discovered cellular hot spots of a potentially toxic protein could open new research avenues into how Alzheimer's disease progresses in the brain. This new research opens the way for gaining deeper insight into how Tau and other key proteins impair neuronal functions in a pathological context such as Alzheimer's disease. It also emphasises why it's critical to continue to invest in core facilities and technologies.
- **Dr Juan Polanco** will share in a \$241 million boost to research from the National Health and Medical Research Council (NHMRC) Ideas Grants. His 5-year grant will further his work on exosomes and investigate the regulators of Tau pathology induced by exosomal and vesicle-free Tau seeds.
- **Professor Jürgen Götz** is part of a multinational collaborative which secured funding through the NHMRC's European Union Joint Programme – Neurodegenerative Disease (JPND) Research 2022 that will further our understanding of the underlying mechanisms of Alzheimer's disease.
- **Professor Fred Meunier** was also awarded an ARC Discovery Projects grant that will uncover how tau and synapsin control the clustering of synaptic vesicles (nerve terminals) and thereby regulate neurotransmitter release, giving us a greater understanding of brain communication.
- In December 2022, CJCADR increased its research groups to include new Group Leaders **Dr Adam Walker** and **Dr Tara Walker**. The now eleven groups within CJCADR involve approximately 90 staff and a HDR cohort of 33. During 2022, thirteen PhD's were conferred and one student thesis was submitted and is under review.
- In December 2022, CJCADR established an Ageing Dementia Research Association (ADRA) with the aim to grow opportunities for new collaborations and interactions, share knowledge, and increase awareness of dementia research in academia, the clinic, and the community, with CJCADR serving as hub. The Association has been well received, with 43 members joining ADRA since inception.

Clinical research

CJCADR is continuing to build its clinical research capability, to complement our existing laboratory research strengths, through the work of QBI Group Leaders Professor Gail Robinson and Professor Peter Nestor.

Professor Robinson is a clinical neuropsychologist, who, with her team bring a focus on neurocognitive diagnostics for dementia. Professor Robinson's dedicated clinic is designed to diagnose dementia cases as early as possible helping to improve outcomes for those living with dementia.

Professor Nestor, a cognitive neurologist, is focused on understanding the earliest stages of Alzheimer's disease and atypical forms of dementia such as primary progressive aphasia. Professor Nestor is working to improve the tools used by clinicians to accurately diagnose the major categories of neurodegenerative diseases. To develop new tests and to help interpret test performance of people living with dementia, the Nestor group is recruiting healthy people. for a research study. To volunteer to be part of Professor Nestor's clinical studies and to find out more, visit the Nestor Lab website.

Volunteer Research Study website

Community Partnerships

goa Community partnership

To celebrate the ten-year anniversary of the Clem Jones Centre for Ageing Dementia Research, QBI partnered with goa billboards who share our mission to drive awareness and improve lives for people living with dementia.

As part of their Community Partnerships Program, goa generously donated free digital advertising to the value of \$250,000. The billboard campaign appeared across South-East Queensland in October and November featuring some of the QBI's heroes of dementia research.

Goa proudly operates a Community Partnerships Program to support not for profit organisations and charities as they serve and improve the community.

Sing, Sing, Sing

The Brisbane Dementia Choir, Sing, Sing, Sing joined QBI staff and students in a celebration morning tea on UQ Giving Day in October, with funds raised going to dementia research. UQ Giving Day raised \$174,000 in donations to dementia research at QBI from 200 donors with many new donors to QBI.

Translational research

In December 2022, the clinical safety trial for a pioneering treatment for Alzheimer's disease commenced in Brisbane. The safety trial — with a limit of 12 participants — is the culmination of a decade of ongoing research led by Professor Jürgen Götz. The study is an important step in determining whether the ultrasound could be safely delivered, following pioneering discoveries about its potential use to improve memory function. The 12-month trial is being conducted at Mater Hospital Brisbane and UQ and is being overseen by researcher and neurologist, Professor Peter Nestor.

Trial participants are being treated in an area at the back of the brain that is affected early in the course of Alzheimer's disease. Each participant receives four treatments which will be administered fortnightly, and after completing the course, they undertake an MRI scan of the brain and a repeat cognitive test. QBI researchers have worked alongside design and engineering teams to develop a fit-for-purpose ultrasound device for clinical use in the trial. The Queensland Government was a foundation supporter of QBI and its research. The study is an exciting milestone for the Clem Jones Centre for Ageing Dementia Research, to drive treatments and interventions for dementia.



goa Community Partnership billboard, featuring QBI Director Professor Pankaj Sah



Brisbane Dementia Choir, Sing, Sing, Sing performed at CJCADR's 10 Year Anniversary morning tea.

QBI's Dementia Research Groups

Thank you from the Group Leaders and research teams at the QBI's Clem Jones Centre for Ageing Dementia Research.



Thank you again for your support of dementia research at QBI and helping us take the lead in solving this global health challenge facing so many in our community. Your partnership helps QBI to continue to be one of Australia's leading dementia research centres. Our innovative research focuses on deepening our understanding about the changes that occur within our brain as we age, solving the question of how and why dementia starts and how we may be able to slow or stop its progression through the development of effective treatments and therapies.

Donate to QBI's Dementia research [here](#)

Learn more about QBI's Dementia research [here](#)



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