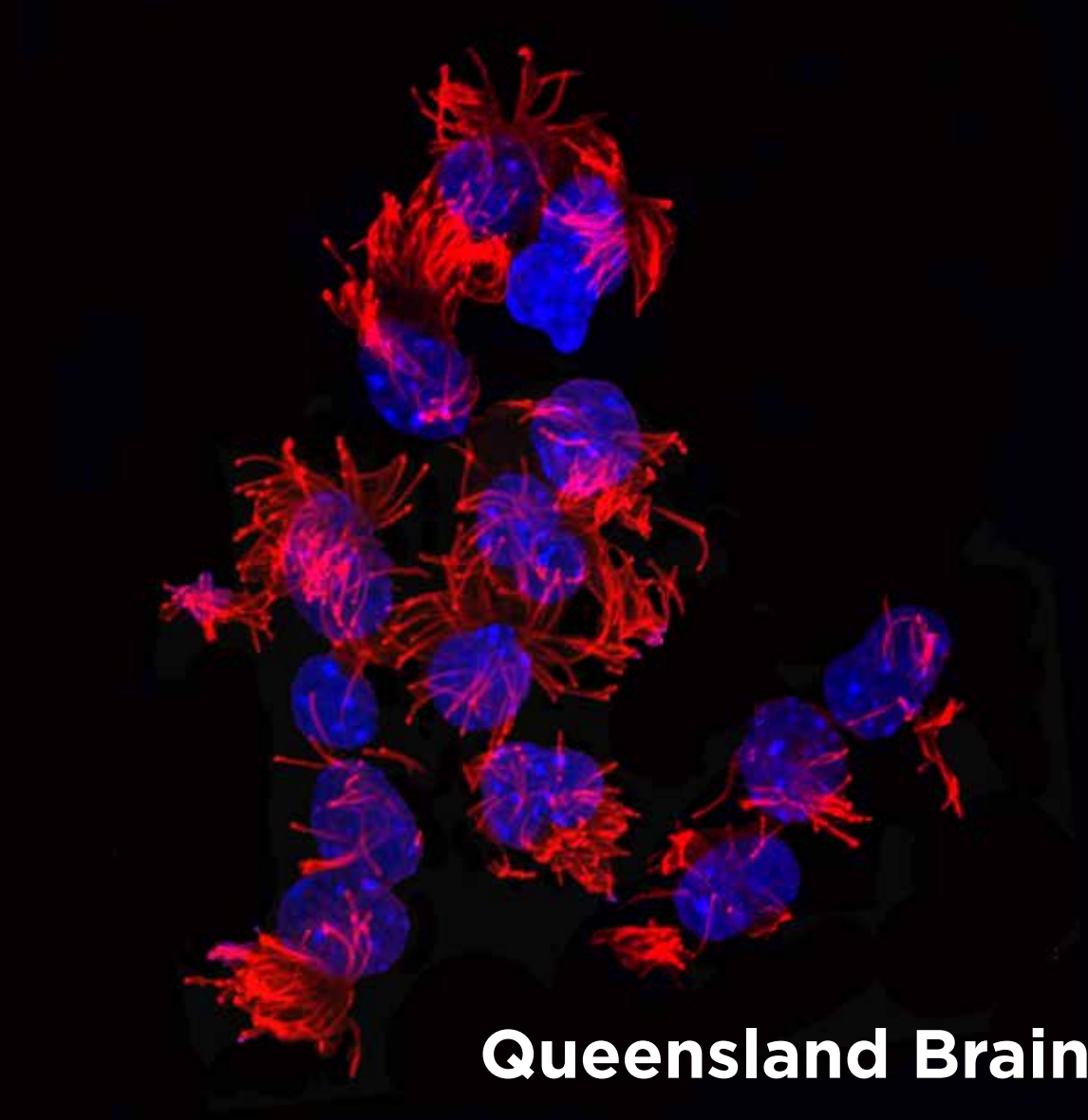
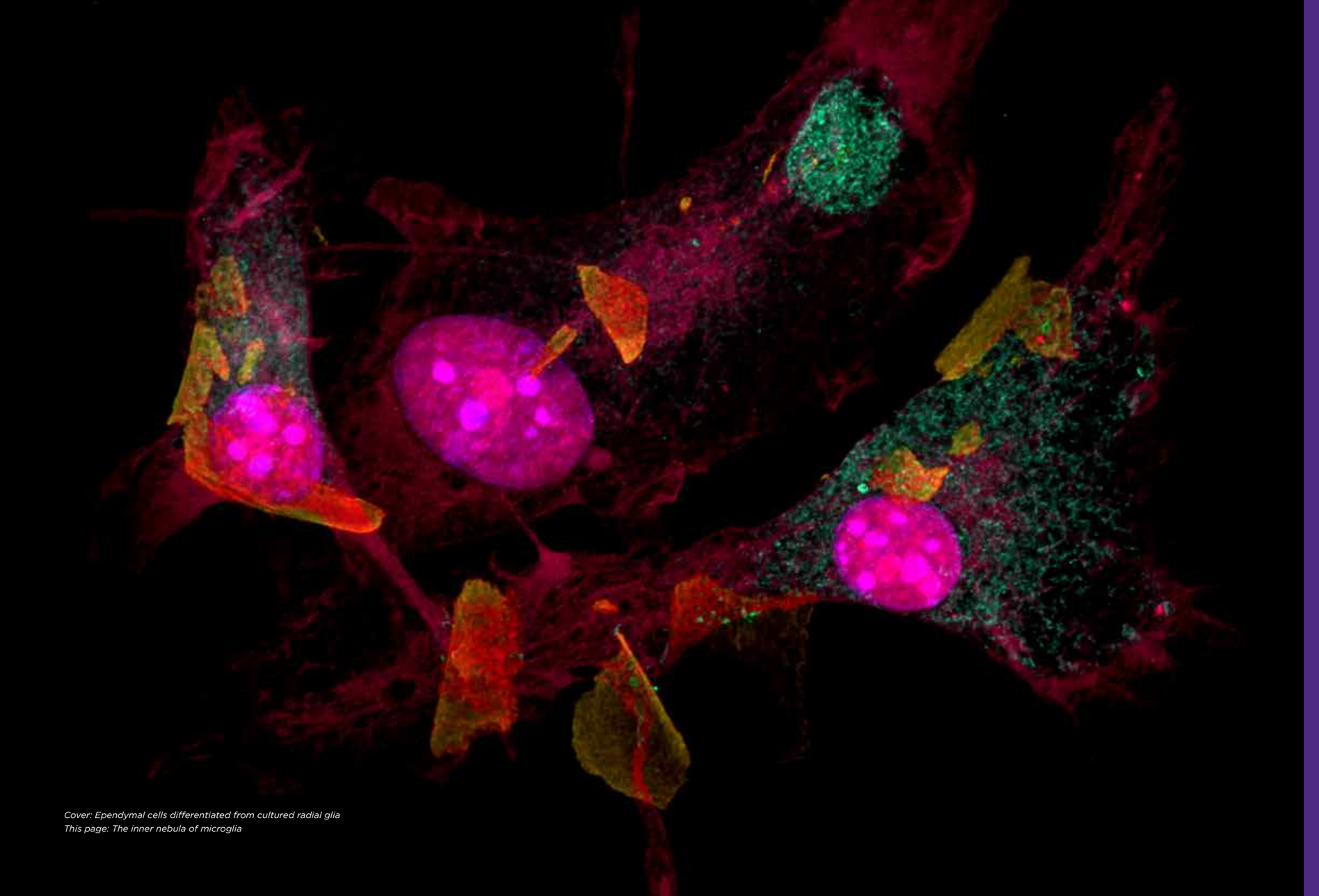


Queensland Brain Institute

Discovering what makes us human

The University Of Queensland
AUSTRALIA

CREATE CHANGE



Cover: Ependymal cells differentiated from cultured radial glia
This page: The inner nebula of microglia

The Queensland Brain Institute (QBI) at The University of Queensland was established in 2003: created with the generous support of Chuck Feeney through The Atlantic Philanthropies and bolstered by the visionary leadership of founding Director, Emeritus Professor Perry Bartlett AO. Along with the support of many esteemed benefactors who have followed in their wake, QBI has flourished to become one of the world's leading neuroscience institutes. Every day, our researchers uncover more about the brain — the wondrous, complex and mysterious organ that makes us who we are.

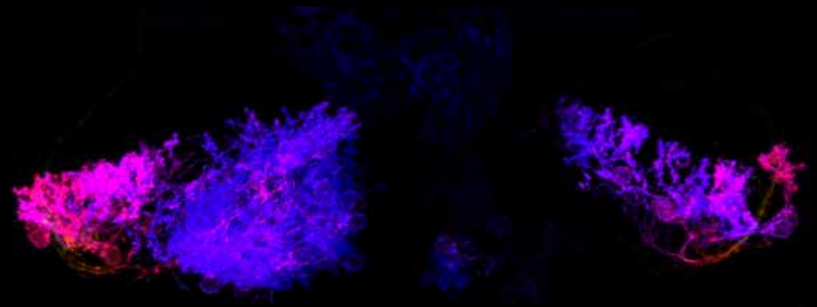
A message from Jeff Maclean – Chair, QBI Advisory Board

Here at QBI we are excited by the infinite possibilities of the brain.

QBI's world-class research means paradigm-shifting innovations are always on the horizon. Breakthrough discoveries, including QBI's discovery of ultrasound to treat Alzheimer's disease and the current EphA4 clinical safety trial developing a potential treatment for motor neurone disease, are only two examples of how fundamental research is leading to solutions that will improve lives.

A sustainable platform for discovery is vital for ensuring QBI's continued scientific success. We've come a long way, but there is still so much to learn. Please consider partnering with QBI, to help us reduce the human impact and cost of brain disease and disorder. A bold ambition to do things differently drives QBI neuroscientists to push the boundaries of discovery and translational research. I invite you to support the QBI team on their remarkable journey.

Jeff Maclean Chair, QBI Advisory Board



"A bold ambition to do things differently drives QBI neuroscientists to push the boundaries of discovery and translational research."

"Every day brings new findings, moving us closer to discovering what makes us human, and finding cures for devastating neurological disorders."

A message from Professor Pankaj Sah – QBI Director

I am privileged to lead this team of talented scientists striving to improve the lives of people around the world.

QBI's mission is to improve lives through a deeper understanding of the brain in health and disease. Understanding what the brain does, and why its dysfunction leads to neurological and mental disorders, presents some of the most challenging questions in society today. Every day brings new findings, moving us closer to discovering what makes us human, and finding cures for devastating neurological disorders.

Through your generosity, we can accelerate new ideas that lead to scientific breakthroughs, support young researchers, progress early stage research, generate new medical technologies, and advance clinical trials. Your contribution will have a significant impact that will inspire hope and ultimately change lives.

Professor Pankaj Sah Executive Director, QBI

“To achieve the big medical breakthroughs of tomorrow, we need to invest in the discovery science of today.”

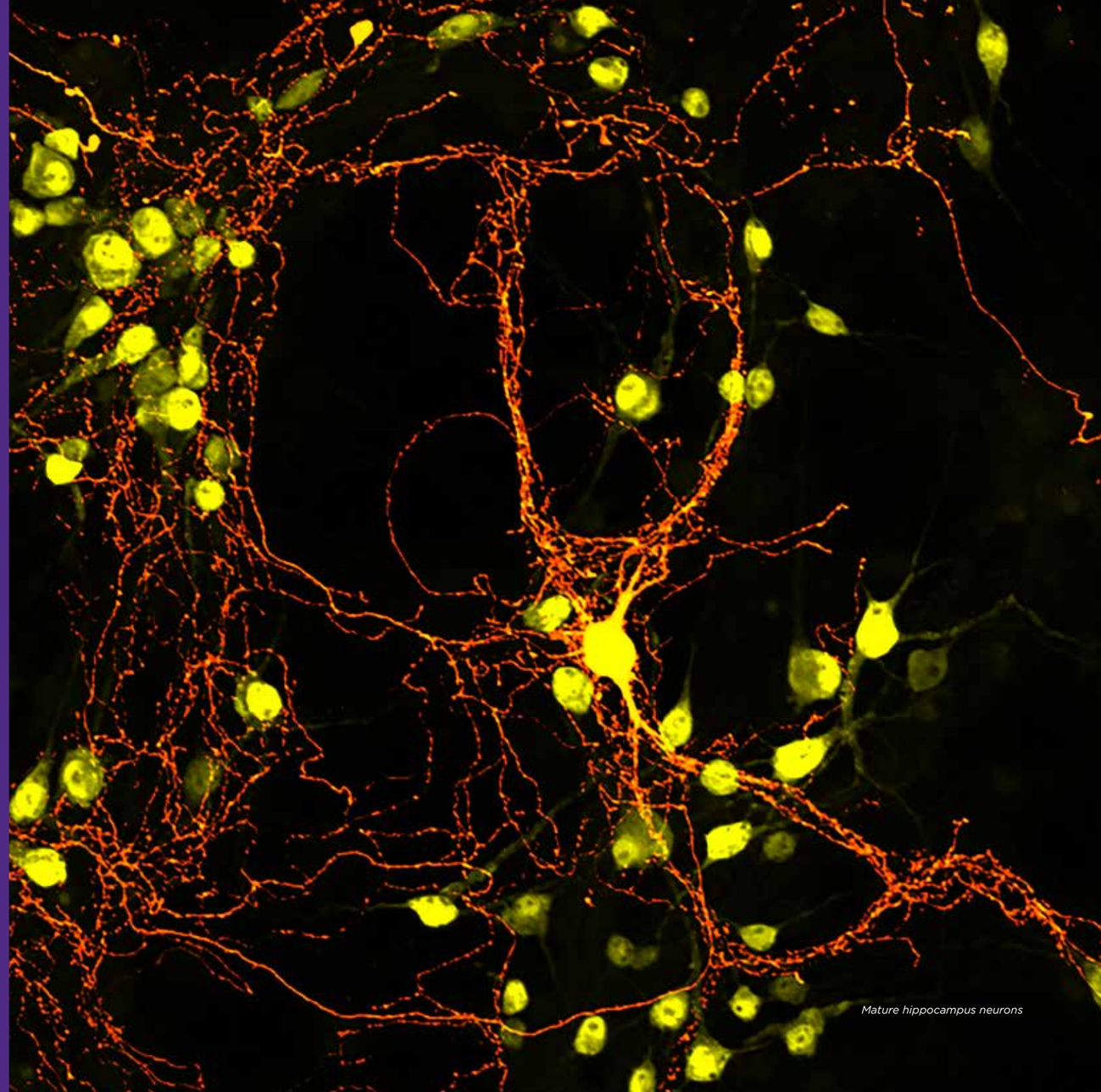
PROFESSOR JOHN MCGRATH AM, RESEARCHER

Queensland Brain Institute
....20 years ahead

The brain, a marvel of nature, is an extraordinary and awe-inspiring organ, intricately designed to house the very essence of human thought and consciousness. Like an unchartered territory, it holds vast expanses of knowledge and potential, much of which remains undiscovered.

Similar to the mysteries of space, there is so much we have yet to comprehend about this enigmatic organ. The more we explore and question its workings, the more it unravels, revealing its profound complexity and leaving us with a multitude of unanswered questions. The brain's capacity to process information, form memories, and generate consciousness is a testament to its remarkable capabilities. It is a perpetual source of wonder, forever urging us to delve deeper into its boundless depths, in an ongoing quest for understanding and awe.

QBI's discovery science is the essential first step in creating pathways out of helplessness in the face of neurological disease – pathways towards real hope. There is no way forward without this kind of fundamental research, and without the continuing support of QBI's generous benefactors.



Mature hippocampus neurons

Our impact
QBI scientists devote their careers to understanding brain function and to progressing high-quality research. Their work is exemplified in five key areas:

Dementia and Ageing
We recognise that dementia is one of society's most pressing health problems. QBI is home to more than 100 world-leading dementia experts in our Clem Jones Centre for Ageing Dementia Research. Our scientists are focused on translating QBI's enhanced knowledge of ageing and dementia research into clinical treatments and interventions that will make an enormous difference to the lives of those living with dementia and their loved ones.

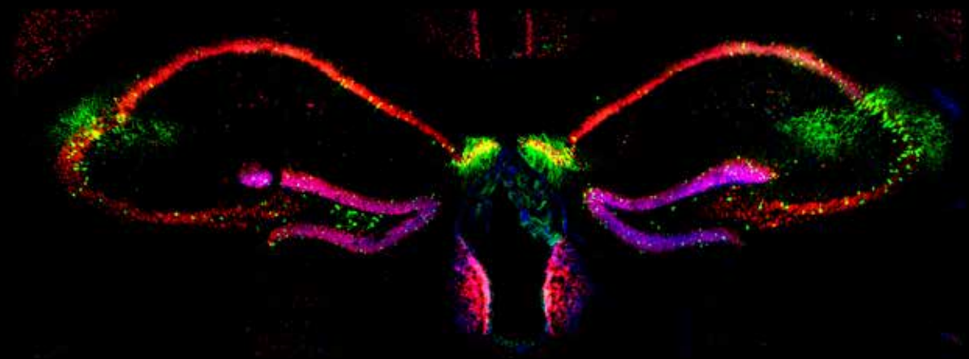
Brain Injury
Monitoring how our brain responds to damage and how it recovers will help inform new diagnostic tools for brain injuries, and more personalised therapies. Our work spans basic science through clinical translation, across the full trajectory of brain injury – from diagnosis through acute care, treatment, rehabilitation and community integration.

Brain Development and Plasticity
Knowing how our brains are built and learn from experience will promote life-long cognitive health and develop a new generation of therapeutics to treat neurological disease. We are leading major discoveries in neuroplasticity, and advancing knowledge of how we treat brain disorders such as stroke, Parkinson's and motor neurone disease.

Mental Health
Improving our understanding of brain function and malfunction will inform revolutionary new therapeutics to combat the neurological and mental health illnesses that increasingly affect both our young and ageing population. Our researchers are uncovering new insights behind a range of mental health conditions, including anxiety and depression, Post Traumatic Stress Disorder, addiction, schizophrenia, and Autism Spectrum Disorder.

Cognition and Behaviour
Explaining how our brains produce thoughts, actions and emotions will help us understand the levers that control higher brain functions, such as cognition, learning and memory. Our work examines how we think about thinking, how we take in and process information, and how we can do that more efficiently.

The hippocampus of an adult mouse lights up with viral and jellyfish neurons



"The human brain has limitless opportunity for discovery. Curiosity and the thrill of uncovering a hidden piece of nature that has been billions of years in the making is incredibly motivating."

ASSOCIATE PROFESSOR STEVEN ZURYN
EPIGENETICS AND MITOCHONDRIA BIOLOGY LABORATORY

“My research focuses on understanding how individual cells work. Within each cell is a tiny universe and we still do not fully understand most of the fundamental aspects of this. The next frontier is to understand the microscopic mechanics of each individual brain cell. By focusing on the building blocks, we can transform our understanding of the brain and prolong neuronal function in the face of disease.”

ASSOCIATE PROFESSOR STEVEN ZURYN EPIGENETICS AND MITOCHONDRIA BIOLOGY LABORATORY

Research highlights

Our researchers undertake fundamental research with the aim of building a pipeline of discoveries that are then translated into clinical treatments. Here are some current examples.

Dementia
We are developing an innovative therapeutic ultrasound approach to target dementia, with clinical trials underway. The objective of this study is the development of a non-invasive and portable ultrasound therapy to treat Alzheimer's disease and other brain disorders in outpatient settings.

Ageing
We are uncovering new insights into the benefits of exercise on ageing and cognition. After conducting one of the largest and most comprehensive longitudinal studies of its kind, our researchers have tracked a large cohort of 65-85-year-old healthy individuals, five years post-study.

Motor neurone disease
Clinical trials are underway on a novel drug for humans that has the potential to block EphA4 preventing the progression of motor neurone disease (MND). Ultimately, the goal is to prevent or slow the disease by protecting motor neurons from dying, leading to a longer and better quality of life for people living with MND.

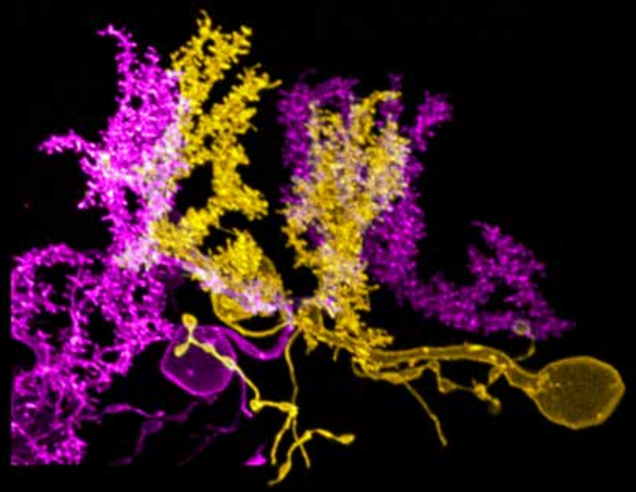
Stroke
We are actively investigating rehabilitation after stroke, studying how stroke disrupts cognition and behaviour to improve quality of life. This research has informed clinical diagnoses and early intervention to help aid recovery.

Parkinson's Disease
Our researchers are using deep brain stimulation to deliver electrical currents to specific brain regions to control a targeted function, such as movement. This stimulation evokes control over the neural activity, allowing QBI researchers and practitioners to treat conditions such as Parkinson's and mental health disorders, including obsessive compulsive disorder, with extraordinary results.

Concussion
We aim to develop a blood biomarker that will detect the severity of a concussion in a unique study partnering with World Rugby, Rugby Australia, Qscan, Trajan and Sonic Health. The study aims to improve the accuracy of concussion diagnoses and the reliability of return-to-play decisions.

Autism
Neuronal activity is clearly different in the brains of people living with Autism Spectrum Disorder, but we lack information about how neurons change their activity. Our researchers are studying early neuronal changes to better understand the early signs of impairment and its impact on neurodevelopmental disorders.

Attention
We are conducting world-first research into the trajectory of attention in the adolescent brain (ages 13 -19) to gain a greater understanding of how attention, thinking and decision-making develops across adolescence.



Dendritic spines

"The brain, the command centre of the human nervous system, remains the least understood organ. But brain research is advancing more rapidly than any other area. It is a terribly exciting time to be an early career researcher."

DR REBECCA SAN GIL, INAUGURAL FIGHTMND EARLY CAREER RESEARCH FELLOW WALKER LABORATORY

“We are using revolutionary gene editing technology to identify new therapeutic targets in neurodegenerative diseases, including MND and frontotemporal dementia. This approach is fast-tracking our understanding of the individual genes and biological processes that cause disease, enabling us to test new gene therapies to treat these neurodegenerative diseases. Through collaboration, I strongly believe that as a scientific community we can work smarter together by combining our specialist expertise.”

DR REBECCA SAN GIL, INAUGURAL FIGHTMND EARLY CAREER RESEARCH FELLOW WALKER LABORATORY

A brighter future than imagined

Philanthropic donations give QBI researchers the ability to deliver impactful research that pushes the frontiers of knowledge. Gifts to UQ's Queensland Brain Institute are tax deductible and 100% of every donation goes to the nominated research or project. There are many ways to create change and support QBI's brain research.

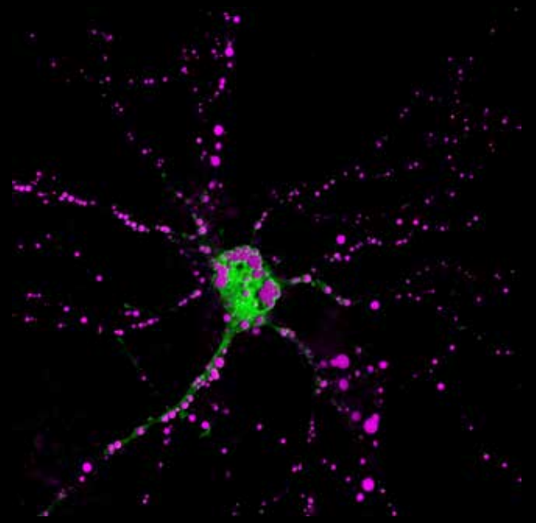
Cash gift
Gifts of cash are among the most valuable forms of support as they enable QBI to meet its priority needs.

Corporate giving
Corporate gifts can be made to support research areas and specific funds to support researchers. Many companies offer employees a matching gift benefit that doubles the contribution to QBI through workplace giving programs or regular payroll deductions.

Gift in Will
Establish a legacy by leaving a gift in Will. These gifts have transformational impact and make a lasting difference to the priority needs of the future while helping to reduce the amount of your taxable estate.

Gift in memory
A special way to honour a loved one is by offering friends and family the opportunity to make a memorial donation to QBI to celebrate their life. An 'in memory' gift will be used to support vital neuroscience research at QBI.

Fundraise
Get involved, have a great time, and fundraise for QBI. Involve your friends, family and colleagues in your fundraising. You may like to set a personal challenge or host a special event to raise money and support QBI's research. The opportunities are endless.



Hippocampus neurons

"There's so much about the brain we don't know, and we hope our involvement with QBI increases our understanding of what really is the most complex organ in the universe."

GARRY AND GAYE WAUGH.

Meet Bobbie and Lyn Brazil

Business leader and philanthropist Bobbie Brazil AO and her husband Lyn Brazil made a multi-million dollar gift to QBI in 2017 to advance research into stroke and motor neurone disease.

"We recognised stroke and motor neurone disease (MND) had only limited treatment options and no cures," said Lyn Brazil.

"This prompted us to establish a clinical arm at QBI to advance research into these devastating disorders."

Through the Brazil Family Foundation, the Brazils donated $8 million, the largest gift received by QBI to date, to establish the Brazil Family Program for Neurology in 2017. This has enabled QBI to:

- Recruit world-leading researchers and support four laboratories focussed on stroke and motor neurone disease.
- Identify a range of potential applications for therapeutic ultrasound to treat dementia, including delivering drugs into the brain.
- Retain researchers who narrowly miss out on government grant funding and help build the data for subsequent grant success.

"Stroke is an important disease to study. It affects more than 50,000 new Australians each year, is the nation's third-biggest killer, and is estimated to cost the healthcare system $5 billion per annum in direct financial costs. QBI is dedicated to researching ways to better treat stroke, with the generous support of donors such as the Brazil family."

BRAZIL FAMILY PROGRAM FOR NEUROLOGY

Nurture research excellence

Partner with QBI to help solve the major neurological health challenges facing society. You can choose to support discovery research or specific studies targeting the clinical signs of disease, disorder, and injury.

Brain Research Endowment Fund
The QBI Brain Research Endowment Fund (BREF) supports our scientists to push the boundaries of discovery. When you give to the Brain Research Endowment Fund, your gift is invested across a diversified portfolio managed by external specialists, with oversight by the UQ Executive. As the value of the fund grows through new gifts and investment returns, so does the annual distribution — and the impact of your gift.

Disease
In partnership with industry, QBI has 34 laboratories investigating the core mechanisms of brain function and disease. The quality and diversity of research being undertaken is outstanding and in the past year QBI achieved some major scientific milestones with innovative research being taken to clinical trials. If there is an area of research that resonates with you, you can choose to support a disorder, laboratory or project.

Fellowships
A fellowship can support an outstanding early and mid-career researcher at QBI, ensuring they can make discoveries that will improve lives. Many QBI researchers who have been awarded fellowships have made advances in fundamental neuroscience and in diseases such as ageing dementia, motor neurone disease, stroke, depression, schizophrenia, and concussion.

Scholarships
An exciting way to support QBI's work is through funding a scholarship. Scholarships support high-achieving PhD students with their research, providing them with the opportunity to make a positive impact on the world.

The skin's mitochondria structure is highlighted in worms

"Our scholarship at QBI not only provides hope for a future cure or treatment for dementia: it invests in students, and has a real impact on their education and career trajectory."

THE THORNTON FAMILY

"Everything we do, every thought we've ever had, is produced by the human brain. But exactly how it operates remains one of the biggest unsolved mysteries, and it seems the more we probe its secrets, the more surprises we find."

PROFESSOR NEIL DEGRASSE TYSON, ASTROPHYSICIST AND SCIENTIST

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

CREATE CHANGE

The QBI team will be in touch to discuss how we can partner through philanthropy:

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