



# CHRONIC CONDITIONS, AGEING AND REGENERATION

An ageing global population has significant implications for the provision of health care and aged care. Addressing the impacts of population ageing will require innovative approaches to enable healthy ageing and enhance productivity in the delivery of healthcare.

Chronic conditions, such as cardiovascular disease, cancer, respiratory disease and diabetes, are leading causes of death in Queensland. Chronic disease is responsible for 60% of deaths worldwide (World Health Organisation). Caused by multiple factors including genetics, lifestyle and environment, chronic diseases will become more common as populations age and risk factors increase. There is a high risk of adults being diagnosed with a chronic disease as they age, and the lifetime risk of cancer, diabetes and cardiovascular disease is ~ 1 in 3 in Queensland.

Queensland researchers are addressing many of the health and medical challenges of ageing, including the development of new therapeutic approaches to treat neurodegenerative diseases. Innovations to enable sustainable health services delivery are developing. Approximately 60% of the increase in the ageing population over the next 20 years in Queensland will occur in the south-east corner of the state, which is also home to the highest concentration of medical research activity, health and hospital infrastructure, and the Queensland clinical trial industry. These factors make Queensland an ideal location for research, development and translation of new solutions to address the healthcare impact of an ageing population.

## **Discover more about the life sciences opportunities in Queensland**

The **Queensland Science Capability Directory** provides information on Queensland's key research capabilities, science expertise, and collaboration and investment opportunities.

🔗 [www.qld.gov.au/ScienceDirectory](http://www.qld.gov.au/ScienceDirectory)

# On the road to success

## Retraining the body's immune system

Dendright is developing novel tolerising immunotherapies to treat autoimmune disease, such disorders being characterised by dysregulated immune responses to self (auto) antigens. In January, Dendright extended its collaboration with US-based Janssen Biotech, Inc. to progress the company's tolerising immunotherapy to the clinic for the treatment of patients with rheumatoid arthritis. Arthritis Queensland has also agreed to contribute funding to the clinical program. The new funds will be used to conduct a first-in-human safety and tolerability study, which will commence enrolment in the second half of 2017.

“Queensland can lay claim to world-class discovery research capability; this provides the footing for building strong collaborations with industry to translate scientific innovations into products of the future.”

Ms Helen Roberts,  
CEO, Dendright



## Geriatric Emergency Department Intervention (GEDI)

GEDI is a collaborative project between the University of the Sunshine Coast and Sunshine Coast Health and Hospital Service designed to provide quicker and more personalised treatment for the elderly. The aim is to decrease hospital and emergency admission rates for elderly people, reduce their length of stay, and improve staff and patient satisfaction. This innovation in health services delivery saved 6000 bed days and opportunity costs of up to \$1 million per year when trialled in one regional hospital. GEDI is part of a larger project that aims to strengthen the capacity of the aged care sector and improve interaction between aged care facilities and hospitals. Contact: Professor Marianne Wallis, mwallis@usc.edu.au, p +61 7 5456 5032.

“Frail older people who present to the emergency department are particularly vulnerable to the negative outcomes associated with a hospital stay. The GEDI team optimises client outcomes by maximising assessment and integrating care across sectors, disciplines and hospital departments.”

Professor Marianne Wallis,  
University of the Sunshine Coast.

## Functional foods address chronic disease

Anthocyanins are naturally occurring antioxidants. The Queensland-developed, -owned and -researched Queen Garnet plum has up to 10 times higher anthocyanin concentrations than other plum varieties. Professor Lindsay Brown and his research team at the University of Southern Queensland have demonstrated that Queen Garnet plums prevent diet-induced inflammation, resulting in loss of abdominal fat, improved heart and liver structure and function, and return of metabolic health in rats. In a small human trial with mildly overweight and hypertensive participants, drinking 250 millilitres of plum nectar each day decreased blood pressure similarly to standard blood pressure medications. ➔ [www.usq.edu.au/research](http://www.usq.edu.au/research)

“The Queen Garnet plum is one of many exciting functional foods produced in Queensland that could decrease the impact of inflammatory and metabolic diseases and promote healthy ageing.”

Professor Lindsay Brown,  
University of Southern Queensland

# Exciting opportunities for investment and collaboration

Professor Smith has been at the forefront of translational research at UQ for over two decades, and is a shining example of successful innovation, collaboration and engagement.

## Olfactory cells for spinal cord repair

The Clem Jones Centre for Neurobiology and Cell Research is part of Griffith University's Griffith Institute for Drug Discovery (GRIDD). It is developing therapies for the treatment of acquired brain and spinal cord injuries, including the use of compounds from natural products, and new techniques to grow cells in three dimensions using three-dimensional bioprinting. Griffith Enterprise is offering investment and collaboration opportunities to help support their current clinical trial.

➔ [www.griffith.edu.au/griffith-enterprise](http://www.griffith.edu.au/griffith-enterprise)



*Emeritus Professor Alan Mackay Sim, Griffith Institute for Drug Discovery, and Australian of the Year 2017, is a pioneering researcher into the regenerative power of olfactory stem cells.*

## Non-invasive treatment of Alzheimer's disease

Researchers from The University of Queensland's Queensland Brain Institute (QBI) and Clem Jones Centre for Ageing Dementia Research are a step closer to the non-invasive treatment of Alzheimer's disease with the discovery that ultrasound on its own, or in combination with immunotherapy, removes toxic protein build-ups that are a hallmark of the disease. The approach temporarily opens the blood brain barrier, activating clearing mechanisms and restoring memory functions.

Research has been conducted in mouse models and is being scaled up in higher animal models. Human clinical trials are planned in two to three years. This could drastically reduce the cost and increase the efficacy of Alzheimer's treatments. The University of Queensland is seeking collaborative partners to further develop this technology.

➔ [www.uniquest.com.au](http://www.uniquest.com.au)

“The discovery is another promising step towards future therapeutic treatments for dementia and other disorders in which proteins aggregate in the brain – including Parkinson's and motor neurone disease”

Professor Pankaj Sah, QBI Director

## Novel diagnostic test for diagnosis of Chronic fatigue syndrome (CFS)

Currently there is no laboratory-based diagnostic test for CFS. The current method of diagnosis can take from 6–18 months and is based on elimination of all other potential causes of the patient's symptoms. A new diagnostic tool that could diagnose patients with CFS immediately would enable medical practitioners to manage CFS with lifestyle, dietary and other interventions to control or slow its progression. Griffith Enterprise is seeking an exclusive licensee for this technology. Contact: Dr Naveed Khan, [naveed.khan@griffith.edu.au](mailto:naveed.khan@griffith.edu.au), p +61 7 3735 4109.

## Microbiome in chronic disease

The microorganisms in the human gut, the gut microbiome, are critically important to human health and wellbeing. Imbalances of these microorganisms are linked to numerous chronic diseases such as obesity, diabetes, arthritis and heart disease. Microba is using the most advanced sequencing technology available to build the world's first, large-scale database of genome-level human microbiome data. This data has the potential to be used to develop new treatments and screening tests for chronic diseases. For further information, please visit ➔ [www.microba.com](http://www.microba.com)

# Facilities and capabilities

Queensland boasts a critical mass of research centres across biotechnology, food and agriculture, health and medical sciences, and offers distinct advantages for conducting clinical trials. Queensland has nine universities, including three of Australia's 10 largest universities.

**The Queensland Brain Institute** at The University of Queensland is home to more than 450 scientists who aim to understand the neural circuits in the brain, how their function results in behavioural outcomes, and how dysfunction of these circuits leads to disorders such as ageing dementia, Parkinson's disease and schizophrenia. The Clem Jones Centre for Ageing Dementia Research at QBI is Australia's first and largest research centre dedicated to the prevention and treatment of dementia.

**Griffith University's National Centre for Neuroimmunology and Emerging Disease Research** is a world-class research facility focusing on the etiology and pathomechanisms of chronic fatigue syndrome.

**The Centre for Chronic Disease Prevention** at James Cook University undertakes research related to prevention of chronic diseases in the community and improving primary health-care practice and care pathways for chronic disease.

**Life Sciences Queensland Limited** is Queensland's peak industry group, working to assist the growth of individual firms and organisations, and build the profile, capacity and capability of the sector to ensure long-term economic, social and environmental benefits to Queensland.

➔ [www.lsq.com.au](http://www.lsq.com.au)

## Queensland offers

- Highly skilled **researchers** with international experience and connections
- Sophisticated research environment with integrated **facilities**
- Ongoing investment by government to support commercialisation of innovation
- A pipeline of opportunities in health, biotechnology and bioagriculture
- A strong **collaborative culture** with partnerships between the academic, research and corporate sectors available
- Ideal location at the crossroads of the Asia-Pacific.

 [qld.gov.au/LifeSciences](http://qld.gov.au/LifeSciences)

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