

## 2022 Dementia Grants Program

### Project Grants<sup>1</sup>

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
<b>AAG Research Trust – Dementia Australia Research Foundation RM Gibson Grant</b>		
Naomi Folder <sup>2</sup>	Dementia Connect: Adaptation and co-creation of a communication partner training program for families of people with dementia	University of Technology Sydney
<b>AAG Research Trust – Dementia Australia Research Foundation Strategic Innovation Grant</b>		
Dr Joyce Siette <sup>3</sup>	Co-developing digital interventions targeting dementia prevention for culturally and linguistically diverse older adults	Western Sydney University
<b>Bondi2Barossa Project Grant</b>		
Dr Kristie Stefanoska	A tau-associated factor to enhance memory function and prevent neuronal cell death	Flinders University
<b>Bondi2Berry Project Grant</b>		
Dr Daryl Ariawan	Pre-clinical development of novel cell-penetrating peptides to block tau-associated neurotoxicity for the treatment of dementia	Macquarie University
<b>Dementia Australia Research Foundation Project Grant</b>		
Dr Michael Healy	Protein homeostasis in Alzheimer's disease: molecular basis for APP trafficking by the SNX17-Commander protein complex	The University of Queensland
Dr Zengmin Li	Understanding glymphatic contribution to cognitive impairment	The University of Queensland
<b>Dr Maree Farrow Memorial Project Grant</b>		
Dr Mohammad Shoab Hamrah	Prevalence and correlates of modifiable risk factors for dementia among South Asian migrants	University of Tasmania
<b>Graeme Samuel Dementia Research Award</b>		
Tergel Namsrai <sup>4</sup>	Investigating the interaction of sleep quality and physical/cognitive training as protective factors for cognitive decline in a randomised controlled trial in the advanced design stages	Australian National University
<b>Hazel Hawke Research Grant in Dementia Care</b>		
Dr Suzanne Dawson	Weighted blankets as a nonpharmacological sleep intervention for people with behavioural and psychological symptoms of dementia: A hybrid effectiveness-implementation pilot study	Flinders University
<b>Lucas' Papaw Remedies Project Grant</b>		
Dr Miia Rahja	'I still want to spend quality time with him': Adapting and implementing an evidence-based dyadic intervention program for people living with dementia in residential aged care	Flinders University

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
<b>Navarra Care Foundation Project Grant</b>		
Dr Fiona Bright	Completing the tauopathy puzzle- modelling novel mutations to uncover unknown roles for tau in neurodevelopment and neurodegeneration	Macquarie University
<b>Sarina Navarra Project Grant</b>		
Dr Alby Elias	Time-Restricted Eating Alzheimer's Trial (TREAT): A randomized controlled pilot study in a population at risk of dementia	The University of Melbourne
<b>The Co-Group Project Grant</b>		
Dr Christa Dang	MiND your thinking: Examining relationships between patterns of repetitive negative thinking and blood-based biomarkers of Alzheimer's disease, neurodegeneration, inflammation and stress	National Ageing Research Institute
Dr Kayla Stefanidis	The Australian Road Safety Study for Older Adults: The ROADSAFE Study Identifying neuropsychological correlates of fitness to drive in older adults	University of the Sunshine Coast

<sup>1</sup> Unless otherwise indicated, valued at \$75,000 over 1-2 years. Funding commences in 2023.

<sup>2</sup> Valued at \$7,000 over 1.5 years. Funding commenced in 2022.

<sup>3</sup> Valued at \$30,000 over 1.5 years. Funding commenced in 2022.

<sup>4</sup> Valued at \$22,500 over 3 years. Funding commenced in 2022.

## Post-doctoral Fellowship<sup>1</sup>

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
<b>Dementia Australia Research Foundation Post-doctoral Fellowship</b>		
Dr Suraj Samtani	A randomised controlled trial of a co-designed social cognitive skills intervention for older adults with cognitive concerns	UNSW Sydney

<sup>1</sup> Valued at \$405,000 over 3 years. Funding commences in 2023.

## Mid-Career Research Fellowships<sup>1</sup>

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
<b>Dr Stuart and Bonnie Bartle Mid-Career Research Fellowship</b>		
Dr Anita Goh	Closing the gap from evidence to practice to enhance dementia care: Using change management and implementation science	National Ageing Research Institute
<b>Henry Brodaty Mid-Career Research Fellowship</b>		
Dr Ashleigh Smith	Placing rural people at the forefront of dementia prevention strategies – The Re-ACTIVate study	University of South Australia
<b>Royce Simmons Foundation Mid-Career Research Fellowship</b>		
Dr Jereme Spiers	Neuroinflammatory profile of microglial extracellular vesicles in Alzheimer's disease	Australian National University

<sup>1</sup> Valued at \$365,000 over 2 years. Funding commences in 2023.

We thank our key donors and partners who have supported this research, including the Australian Association of Gerontology, Australian National University, Bondi2Barossa, Bondi2Berry, Dr Stuart and Bonnie Bartle, Lucas' Papaw Remedies, Mostyn Family Foundation, Hazel Hawke Alzheimer's Research & Care Fund, Navarra Care Foundation and The Co-Group.

## **Project Grant Summaries**

### **AAG RESEARCH TRUST – DEMENTIA AUSTRALIA RESEARCH FOUNDATION RM GIBSON GRANT**

**Naomi Folder, University of Technology Sydney**

*Dementia Connect: Adaptation and co-creation of a communication partner training program for families of people with dementia*

The communication changes that occur in dementia are the most challenging aspect of living with dementia, for both the person and their families, linked to depression, isolation, changed behaviours, and reduced quality of life. Dementia guidelines therefore recommend communication partner training (CPT), where families are trained in supportive communication strategies. However, many CPT programs are not easy to access (especially online), not often informed by consumers, and may not incorporate effective training techniques to lead to long-term changes. To support communication, our team has asked: can an existing CPT program for people with traumatic brain injury (TBI) be adapted to dementia? We aim to co-create a CPT program with people living with dementia, their communication partners, and speech pathologists, through adaptation of an existing, evidence-based program called “Convers-ABI-lity” (previously “TBI Connect”). As the communication strategies for dementia and TBI often overlap, using a high-quality example of a CPT program provides an initial reference point to support co-creation for a dementia-specific resource. Through interviews and workshops, stakeholders will evaluate “Convers-ABI-lity” and collaborate as joint decision makers with the research team on required changes and modifications. The end-product will be 'Dementia Connect', a co-created CPT program for families of people with dementia.

### **AAG RESEARCH TRUST – DEMENTIA AUSTRALIA RESEARCH FOUNDATION STRATEGIC INNOVATION GRANT**

**Dr Joyce Siette, Western Sydney University**

*Co-developing digital interventions targeting dementia prevention for culturally and linguistically diverse older adults*

Public health campaigns targeting better brain health for older adults are promising. Yet, most campaigns do not support seniors from multicultural backgrounds and therefore do not resonate with the general community. The Western Sydney district represents a large multicultural environment, with 54.1% of households speaking a non-English language (compared to the NSW average of 26.5%), and Chinese communities representing the largest multicultural group. This project will work with Chinese seniors to co-design a digital program encouraging healthy brain lifestyles. The research will involve an iterative process to identify acceptability and authenticate correct messaging and culturally appropriate materials. Findings will inform public health initiatives and contribute to the future application of appropriate, feasible interventions designed to reduce the risk of dementia for older Chinese adults residing in Australia.

## **BONDI2BAROSSA PROJECT GRANT**

**Dr Kristie Stefanoska, Flinders University**

*A tau-associated factor to enhance memory function and prevent neuronal cell death*

The toxic clumping of a brain protein called tau is underlying in Alzheimer's disease. A process called hyperphosphorylation causes tau to become toxic. This destroys the structure of neurons and prevents important nutrients from reaching parts of the brain. Those parts eventually shrink and die. Unfortunately, we don't know why or how this occurs. In this project, Dr Stefanoska will increase our understanding of Alzheimer's disease development by investigating how tau-induced brain cell death contributes to cognitive decline. Dr Stefanoska is aiming to establish whether a protein called NSF could be a therapeutic target to reduce the detrimental effects of tau and protect neurons from its toxicity. The results will facilitate a more informed approach in the future development of drug therapies for cognitive impairment in Alzheimer's disease.

## **BONDI2BERRY PROJECT GRANT**

**Dr Daryl Ariawan, Macquarie University**

*Pre-clinical development of novel cell-penetrating peptides to block tau-associated neurotoxicity for the treatment of dementia*

Two hallmarks of Alzheimer's disease pathology are the toxic clustering of proteins called amyloid-beta and tau, which cause the death of brain cells. A number of clinical trials of drugs that act on amyloid-beta have failed, making tau a new therapeutic alternative. Previous research has shown that a peptide, consisting of the C-terminal amino acids of N-methyl-D-aspartate receptors attached to a cell-penetrating sequence (Tat-NR2B9c), can block tau-mediated toxicity and increase brain cell survival. In this project, Dr Ariawan proposes to improve the stability of Tat-NR2B9c by incorporating it into a novel cyclic peptide scaffold. She will then examine its efficacy in an Alzheimer's disease mouse model and determine the effects on cognition and behaviour. Furthermore, to enhance clinical translation, she will assess this peptide in brain organoids derived from people with Alzheimer's disease. Together, these studies will generate essential pre-clinical data for a novel treatment for dementia.

## **DEMENTIA AUSTRALIA RESEARCH FOUNDATION PROJECT GRANTS**

**Dr Michael Healy, The University of Queensland**

*Protein homeostasis in Alzheimer's disease: Molecular basis for APP trafficking by the SNX17-Commander protein complex*

Alzheimer's disease is a debilitating neurodegenerative condition that has an enormous personal impact for people living with the disease, their families and carers. Currently, all attempts to find a cure for Alzheimer's disease have failed and treatments only temporarily mitigate its effects. New approaches that act on the underlying causes the disease are urgently needed. One approach is to develop treatments that target macromolecular assemblies (that regulate protein turnover and homeostasis) to prevent the build-up of toxic proteins and peptides in the cell. In this work, Dr Healy will characterise a relatively unknown macromolecular assembly that is involved in maintaining the homeostasis of LRP1 and APP; proteins that have been heavily implicated in the development of Alzheimer's disease. Dr Healy believes that by better understanding the

fundamental biology of this system, it will be possible to develop new targeted therapies that treat the underlying causes of disease progression.

### **Dr Zengmin Li, The University of Queensland**

#### *Understanding glymphatic contribution to cognitive impairment*

Alzheimer's disease is characterised by cognitive impairment and the accumulation of toxic proteins in the brain. Recent studies have suggested that impairment of a brain fluid pathway for waste clearance – the glymphatic system – is likely a major cause of the accumulation of toxins. This has opened new directions for treating dementia but no therapeutics have been found due to the lack of understanding of its regulatory pathway. On the other hand, waste clearance is also essential for optimal brain function. Whether and how deficient waste clearance contributes to the most fundamental symptom of dementia, memory impairment, is still unknown. This research proposal aims to understand whether suppression of the glymphatic system can impair cognitive function and to identify potential new targets for future therapeutic research in dementia. Dr Li will combine advanced imaging and behavioural test to examine the effects of modulating the glymphatic system on memory in an animal model of dementia. The research findings from this project will provide key knowledge about the glymphatic function and target for the treatment of cognitive decline in dementia.

### **DR MAREE FARROW MEMORIAL PROJECT GRANT**

#### **Dr Mohammad Shoaib Hamrah, University of Tasmania**

#### *Prevalence and correlates of modifiable risk factors for dementia among South Asian migrants*

Australia's South Asian population has increased rapidly and now accounts for over 14 per cent of our total overseas-born residents. South Asian migrants are at greater risk of dementia but, unfortunately, they are less likely to access health services that can reduce this risk. Dr Hamrah will examine the prevalence and correlates of modifiable risk factors for dementia among 200 Indian, Bhutanese, Nepalese and Afghan migrants aged 50 years or over who are now living in Tasmania. Key members of these communities will be contacted to provide them with information about the study, to ensure the approach is culturally respectful, and invite their assistance to recruit participants. Gaining a clearer picture of the health risk profile of Tasmania's migrant populations will guide preventive interventions to minimise future poor health trajectories and ultimately reduce dementia risk. The results will facilitate the design of culturally appropriate interventions that address dementia risk factors and feed into systematic approaches to developing an educational intervention that reaches thousands of migrants across Australia.

### **GRAEME SAMUEL DEMENTIA RESEARCH AWARD**

#### **Tergel Namsrai, Australian National University**

#### *Investigating the interaction of sleep quality and physical/cognitive training as protective factors for cognitive decline in a randomised controlled trial in the advanced design stages*

The global prevalence of dementia is increasing and is projected to climb further with population ageing. Since there is currently no cure for dementia, identification of risk factors and development of risk reduction strategies are the most promising option to reduce its prevalence and the associated disease burden. Sleep is one of the emerging risk factors for dementia. However, the

role of sleep in neurodegeneration and its interaction with other risk factors are not well understood. Therefore, this project aims to investigate the role of sleep on dementia, cognitive decline, and its association with other modifiable risk factors such as physical activity in middle-aged population by exploring following questions: 1) How does subjective and objective sleep affect dementia and cognition? 2) How does physical activity affect sleep and does it moderate neurodegeneration in dementia and cognition? 3) How does subjective and objective sleep affect cardiovascular health and does it moderate neurodegeneration in dementia and cognition? The completion of this project will further the understanding of sleep on brain, specifically on dementia and cognition and its interaction with physical activity and other factors in middle aged adults before the onset of pathological changes in the brain. This can provide basis for development of risk reduction strategies for dementia that can facilitate in healthy brain ageing and prevention of dementia.

## **HAZEL HAWKE RESEARCH GRANT IN DEMENTIA CARE**

**Dr Suzanne Dawson, Flinders University**

*Weighted blankets as a nonpharmacological sleep intervention for people with behavioural and psychological symptoms of dementia: A hybrid effectiveness-implementation pilot study*

Sleep disturbances are common among people living with dementia, with consequences far reaching for the person, their carers and care systems. Sleep disturbances result in decreased quality of life for the person with dementia and cause significant stress for caregivers. Additionally, sleep disturbances are associated with increased admissions to care settings and healthcare costs. As such, sleep disturbances for people living with dementia are recognised as a major challenge that requires addressing. Nonpharmacological interventions are prioritised for the treatment of sleep disturbances; however, medication is frequently used, with a range of risks (including increased falls and confusion). Currently there is no gold standard sleep intervention for people with dementia. The use of weighted blankets is emerging as a safe sleep intervention option, although little is known about the effectiveness for people with dementia. This research seeks to generate evidence and recommendations to improve sleep outcomes for people with dementia living in a range of settings. A staged investigation will be conducted to 1) examine the effectiveness of weighted blankets as a sleep intervention for people with dementia; 2) understand the barriers and facilitators to use of weighted blankets; and 3) co-design a plan for future implementation across a range of settings.

## **LUCAS' PAPA W REMEDIES PROJECT GRANT**

**Dr Miia Rahja, Flinders University**

*'I still want to spend quality time with him': Adapting and implementing an evidence-based dyadic intervention program for people living with dementia in residential aged care*

Living in residential aged care can be challenging, for people living with dementia and their care supporters. These people and their care supporters have asked for care programs that provide opportunities for social and emotional support, teach them strategies around how to participate in everyday living activities, and how to address changes in behaviours attributable to the disease. Programs that teach how to communicate with people living with dementia, to involve them in activities that are suitable to their abilities, or to understand behavioural changes that may occur when the person with dementia has difficulty expressing their needs or wants, have not been available in residential care. This study will adapt one such program that was designed for persons



living in the community to residential care. Dr Rahja will evaluate if the adapted program can work in real-life. She will train care facility staff and invite residents and their care supporters to participate in the program. Dr Rahja will use surveys, interviews and group discussions to find out how beneficial and acceptable the program is. At the end, she will prepare a case study that describes if and how these types of programs can be included in residential care in the future.

## **NAVARRA CARE FOUNDATION PROJECT GRANT**

### **Dr Fiona Bright, Macquarie University**

*Completing the tauopathy puzzle- modelling novel mutations to uncover unknown roles for tau in neurodevelopment and neurodegeneration*

A chromosomal band called 17q21.31 is a 'genetic postcode' and the most famous gene that resides at this address is MAPT (microtubule-associated protein tau). The MAPT gene is significant in dementia research, as variations in it are linked to several types of dementia. MAPT encodes a protein called tau, which is important for healthy brain function. However, in some forms of dementia, something goes wrong, causing tau to become pathological. The 17q21.31 genetic postcode is a hotspot for these types of changes. Recently, new genetic changes in 17q21.31 were identified in patients with unexplained dementia-like symptoms, who also had pathological tau deposits in their brains. Most of these patients were children and adolescents, so it is possible they could be classified as having childhood dementia. Unfortunately, scientists don't know why this genetic change occurs, or which parts of the brain are involved. Dr Bright will study human stem cells and brain organoids, also known as "mini brains", in a petri dish. This will allow her to model the hallmark brain changes that occur because of these genetic changes. This project will provide significant understanding of dementias that exhibit abnormal tau deposits within the brain and further explore the role of tau in the brain across ageing. The results of this project will enable the discovery and development of tailored, disease-specific drug treatments for tau-related dementias.

## **SARINA NAVARRA PROJECT GRANT**

### **Dr Alby Elias, The University of Melbourne**

*Time-Restricted Eating Alzheimer's Trial (TREAT): A randomized controlled pilot study in a population at risk of dementia*

There are no definite treatments or preventive drugs for dementias arising from Alzheimer's and other neurodegenerative diseases. Time-restricted eating (TRE) by fasting between meals for 12-24 hours is a novel and promising approach. It is shown to produce benefits in obesity, arthritis, diabetes mellitus, and hypertension. It is associated with improved health of blood vessels, reduced inflammation, enhanced capacity of cells to repair damage and adapt to stress, and removal of the beta-amyloid protein from the brain, a hallmark pathology of Alzheimer's disease. Occlusion of small blood vessels and inflammation play important roles in Alzheimer's and vascular dementias. The role of TRE in dementia risk reduction has not been studied in humans to this date. Inclusion of people at risk of dementia will promote identification of the benefits of TRE-a method known as trial enrichment. "At risk" is defined as a family history of dementia in a first degree relative and age over 60 years. Participants for this study will include family members of people affected by dementia. They will be randomly divided into two groups, one on TRE and the other on unrestricted diet. The duration of TRE will be decided by engagement, co-design, and a qualitative survey among family members of people affected by dementia before the pilot trial. Feasibility,

acceptability and safety, memory, body weight, and biomarkers of dementia will be measured and compared between the groups. The implications will be the adoption of TRE into healthy lifestyles to reduce dementia risk in a high-risk population.

## **THE CO-GROUP PROJECT GRANT**

### **Dr Christa Dang, National Ageing Research Institute**

*MiND your thinking: Examining relationships between patterns of repetitive negative thinking and blood-based biomarkers of Alzheimer's disease, neurodegeneration, inflammation and stress*

Repetitive negative thinking (RNT) is an ongoing and continuous pattern of thinking negatively about a lot of possible things (e.g. yourself, the world and people around you, the past, the future, the present). Studies have found relationships between more RNT and greater rates of depression and/or anxiety, chronic stress responses, inflammation in the entire bodily system and brain, increased signs of toxic proteins associated with Alzheimer's disease and worsening cognitive ability. Because RNT affects things like stress and inflammation, which we know are harmful to the body and brain, it might be possible that we can reduce chances of someone developing Alzheimer's disease in their future if we can find a way to help them reduce how much RNT they do. The MiND Your Thinking project is a pilot study will include people from the existing Markers in Neuropsychiatric Disorders (MiND) Study. The aim is to test whether there are connections between more RNT and cognitive decline as well as signs of Alzheimer's disease, inflammation, stress responses, or neurodegeneration using markers measured in blood samples. Dr Dang will then test whether RNT or any of the biomarkers can predict diagnosis of a neurodegenerative disorder.

### **Dr Kayla Stefanidis, University of the Sunshine Coast**

*The Australian Road Safety Study for Older Adults: The ROADSAFE Study Identifying neuropsychological correlates of fitness to drive in older adults*

With the growing ageing population, there is a clear and urgent need for the development of reliable and valid measures to screen for fitness to drive in older adults with cognitive decline. However, at present, there are no guidelines or gold standard assessment methods available to assess cognitive functions relevant for driving, and for identifying when patients with cognitive decline are no longer safe to drive. Accordingly, this study aims to: (a) identify cognitive correlates of reduced driving capacity in older adults and (b) identify a combination of cognitive measures that best predict driving capacity. The findings from this study will inform the development of an online cognitive screening tool that can be used to identify at-risk adults requiring a formal on-road driving assessment. The findings from the research program will have critical implications for road safety, such that they will inform the development of a bedside screening tool that can be used to assess whether or not a formal driving assessment is required, which will reduce the potential of unnecessary driving assessments in older adults who are cognitively fit to drive.



## Post-doctoral Fellowship Summary

### DEMENTIA AUSTRALIA RESEARCH FOUNDATION POST-DOCTORAL FELLOWSHIP

**Dr Suraj Samtani, University of New South Wales Sydney**

*A randomised controlled trial of a co-designed social cognitive skills intervention for older adults with cognitive concerns*

Older adults with cognitive concerns are at greater risk of loneliness, depression, and dementia. Often their cognitive difficulties are related not only to memory problems, but also to difficulties in social situations, such as missing social cues or having trouble keeping conversations going. Existing treatments focus on improving memory or language, but there is no treatment focusing on enhancing or maintaining social skills and connections. The Team at UNSW Sydney received a pilot grant to co-design a 'Maintaining Social Engagement program' with Dementia Australia advocates. It's an online group program targeting social cognitive skills such as reading body language, keeping conversations going, overcoming memory and sensory challenges, and being assertive. The pilot study revealed promising improvements in understanding and communicating with others. With this Fellowship, Dr Samtani will run a randomised controlled trial to test if the program helps older adults with cognitive concerns to stay socially connected. He will partner with Silverchain, one of Australia's largest aged care providers, who provide services for over 21,000 older adults in the community. Dr Samtani's goal is to help older adults with cognitive concerns feel more confident in social situations, feel connected and happier, and potentially improve their quality of life.

## Mid-Career Research Fellowship Summaries

### DR STUART AND BONNIE BARTLE MID-CAREER RESEARCH FELLOWSHIP

**Dr Anita Goh, National Ageing Research Institute**

*Closing the gap from evidence to practice to enhance dementia care: Using change management and implementation science*

To provide high-quality dementia care, aged care provision should be based on using the best practices, which are based on research. However, it takes on average 17 years for research evidence to reach clinical practice. In dementia care, there are many dementia training and knowledge programs, or 'interventions', which have been formally tested in research to show improvement in outcomes for people living with dementia and their family members, and indeed for all aged care recipients. However, aged care providers can be slow to use new interventions, and many barriers exist to research translation. Additionally, there is no "one-size-fits-all" approach to translating interventions into practice in aged care, in part due to the variability and complexity of the sector, and unassisted translation into practice is unlikely. The aim of the fellowship is to increase the rate of collaborations between aged care providers and researchers and increase the success rate of the implementation of evidence-based interventions. In turn, this will speed up research translation. Dr Goh will use the principles of research, implementation science, behavioural science, and organisational theory to understand how we can achieve faster and more effective use of dementia interventions in aged care. This fellowship co-creates new evidence-based Implementation Guidelines with the Australian sector, so that researchers can work collaboratively with aged care providers to find a shared commitment to implement changes,

aligning research-verified programs to organisational characteristics, and then choose the best strategies for rollout. More aged care providers providing evidence-based practice improves the quality of dementia care.

## **HENRY BRODATY MID-CAREER RESEARCH FELLOWSHIP**

**Dr Ashleigh Smith, University of South Australia**

*Placing rural people at the forefront of dementia prevention strategies – The Re-ACTIVate study*

People living in rural and regional Australia experience a 1.4 times higher burden of chronic disease and up to 3 to 5 times higher prevalence of dementia compared to those in major cities. Despite this, few rural centric dementia prevention strategies exist. The Rural and REgional ACTIVate (Re-ACTIVate) project will expand the successful ACTIVate study outside urban cities. By harmonising measures with the UniSA Team's already funded ACTIVate study, Dr Smith will for the first time characterise dementia risk in rural communities at 1) the individual level, 2) map services, accessibility and dementia friendliness of rural communities at the level of the community and 3) co-design with rural community members a bespoke dementia prevention toolkit for use in rural communities. The Re-ACTIVate project places rural people at the forefront of dementia prevention in their own communities. A key strength is conducting implementation research leading to a bespoke and scalable dementia prevention toolkit. By engaging with rural people, Dr Smith will ensure the toolkit is acceptable and aimed at extending healthy life and delaying dementia onset in Australians who live outside major cities. Community engagement is at the heart of this project.

## **ROYCE SIMMONS FOUNDATION MID-CAREER RESEARCH FELLOWSHIP**

**Dr Jereme Spiers, Australian National University**

*Neuroinflammatory profile of microglial extracellular vesicles in Alzheimer's disease*

Alzheimer's disease is an incurable degenerative disease caused by the misfolding and build-up of key proteins resulting in the death of specialised brain cells called neurons. It has been suggested that affected cells transmit these damaged proteins to healthy cells, together with several other factors altering the course of the disease, resulting in further Alzheimer's disease progression. The cells could do this by packaging these proteins in small membrane-bound packets known as extracellular vesicles (EVs) which carry the language specific to each cell into their surroundings which lets different cell types and brain regions communicate. Although EVs are known to facilitate the progression of neurodegenerative diseases, the lack of sensitive technology means very little is known about which proteins EVs communicate from specific cell types within the brain. New techniques allow researchers to obtain EVs from human brain tissues and advances in technology enable EVs to be characterised with exquisite sensitivity. This project aims to use these techniques to obtain EVs from healthy control and Alzheimer's disease tissues and identify different EV populations, focusing on inflammatory communication. This will allow Dr Spiers to observe how specific populations of EVs contribute to inflammation in Alzheimer's disease.