Dementia Australia™ Research Foundation

2023 Dementia Grants Program

Project Grants[1]

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
AAG Research Trust – Dementia Australia Research Foundation RM Gibson Grant		
Dr Diana Matovic[2]	From isolation to inclusion: Increasing access to social participation for older Australians with mild cognitive impairment/early dementia and their supporters	Macquarie University
AAG Research Trust – Dementia Australia Research Foundation Strategic Innovation Grant		
Dr Lisa Wong[3]	The effectiveness of a co-designed and culturally adapted dementia support program for Chinese-Australian carers	Western Sydney University
Dementia Research Community Project Grant		
Dr Caitlin Finney	Precision medicine for late onset Alzheimer's disease using machine learning and human-derived 3D brain models	The University of Sydney
Dr Sian Genoud	Investigating mechanisms of abnormal tau uptake and release in glia	Macquarie University
Dementia Australia Research Foundation Project Grant		
Dr Adekunle Bademosi	Elucidating the role of UNC13A risk variants in sporadic frontotemporal dementia	The University of Queensland
Dr Maryam Ghahramani	A pilot study on younger onset dementia detection using machine learning and the impact of a 12-week home-based exercise program for enhancing motor function in younger onset dementia	University of Canberra
Dr Xiaochen Liu	The misfolding and aggregation of Huntingtin Protein: a case study of environmental effects	The University of Sydney
Dr Margaret MacAndrew[4]	Autonomy and safety for people living with dementia: The 3Ps approach to Getting Home Safely with dementia	Queensland University of Technology
Dr Rossana Rosa Porto	Heat shock as an effective low-cost therapy for the prevention and treatment of Alzheimer's disease	Western Sydney University
Dr Maree Farrow Memorial Project Grant		
Dr Edward Bliss	A co-designed physical activity intervention to improve cognition and cerebrovascular function in sedentary, obese older regional adults living in independent care	University of Southern Queensland
Dr Stuart and Bonnie Bartle Project Grant		
Dr Jacqueline Wesson	Functional cognition screening to detect subtle functional difficulties in everyday activities in older adults: which tool is fit for purpose?	The University of Sydney
Dr Amanda Cross	Empowering consumers and healthcare professionals to make evidence-based, informed decisions regarding the pharmacological management of urinary incontinence for people living with dementia	Monash University

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Hazel Hawke Research Grant in Dementia Care		
Dr Deborah Brooks	Improving the mental health of residents with dementia: Pilot-testing a Mental Health Care Indicator Tool within residential aged care homes	The University of Queensland
The Co-Group Project Grant		
Dr Sandra Garrido[4]	Building the evidence for the benefits of music programs in aged care	Western Sydney University
The Providence Foundation Project Grant		
Dr Andrew Care[4]	Cage fighting with dementia: Bioengineering protein cages into a next generation vaccine against Alzheimer's disease	University of Technology Sydney

[1] Unless otherwise indicated, valued at $75,000 over 2 years. Funding commences in 2024.
[2] Valued up to $10,000 over 1.5 years. Funding commenced in 2023.
[3] Valued up to $30,000 over 1.5 years. Funding commenced in 2023.
[4] Special Grant Round open to previous grant recipients who had recently completed their Dementia Australia Research Foundation funded project, valued up to $100,000 over 3 years. Funding commenced in 2023.

Post-doctoral Fellowships

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Race Against Dementia – Dementia Australia Research Foundation Post-doctoral Fellowship		
Dr Pradeep Manuneedhi Cholan[1]	Identifying the effects of the gut microbiome on microglial cells in Alzheimer's disease	Macquarie University
Dementia Australia Research Foundation Post-doctoral Fellowship		
Dr Rachael Cvejic[2]	Understanding responsive behaviours among people with intellectual disability living with dementia	UNSW Sydney

[1] Valued at $417,000 over 3 to 5 years. Funding commences in 2024.
[2] Valued at $417,000 over 3 years. Funding commences in 2024.

Mid-Career Research Fellowships[1]

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Henry Brodaty Mid-Career Research Fellowship		
Dr Edwin Tan	Co-designing a personalised medicine calculator to improve antipsychotic prescribing in people living with dementia	The University of Sydney
Royce Simmons Foundation Mid-Career Research Fellowship & Dementia Advocates Award		
Dr Pratishtha Chatterjee	Determining and targeting alpha-synuclein pathology in dementia with Lewy bodies and Alzheimer's disease	The University of Melbourne
Royce Simmons Foundation Mid-Career Research Fellowship		
Dr Luke Gray Whiley	Advancing the understanding of genetic risk in sporadic Alzheimer's disease by elucidating the metabolic consequences of ABCA7 polymorphisms	Murdoch University

[1] Valued at $377,000 over 2 years. Funding commences in 2024.

Travel Grants[1]

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Dr Leila Akbari	Unravelling molecular mechanisms of tau propagation through the use of microdialysis	Macquarie University
Dr Marianne Coleman	Helping dementia-friendly eyecare to happen everywhere	The University of Melbourne
Dr David Foxe	Evolving motor features in primary progressive aphasia: insights from event-based modelling	The University of Sydney
Dr Helen Macpherson	Food for thought: How does diet influence dementia risk?	Deakin University

[1] Valued up to $15,000 over 1 year. Funding commences in 2024.

Project Grant Summaries

AAG RESEARCH TRUST – DEMENTIA AUSTRALIA RESEARCH FOUNDATION RM GIBSON GRANT

Dr Diana Matovic, Macquarie University

From isolation to inclusion: Increasing access to social participation for older Australians with mild cognitive impairment/early dementia and their supporters

Older adults with mild cognitive impairment and early dementia often experience social isolation. Their supporters commonly experience social isolation too. Social isolation often leads to feelings of depression, anxiety, loneliness, poor wellbeing, and the development of dementia. Research shows that frequent and varied social activities both reduce the risk of developing dementia and slow the rate of cognitive decline in people with mild cognitive impairment. Unfortunately, there is limited understanding of ways to address social isolation in these populations. Dr Matovic will address this critical knowledge gap by adapting an already-existing, evidence-based intervention that increases varied social participation. Dr Matovic has established a survey and focus group study, which will identify the barriers and facilitators of social participation in these populations. The team plans to: 1) use this information to adapt an intervention in focus groups with people with cognitive impairment and supporters; and 2) pilot test the intervention over three months to evaluate whether it increases social participation and wellbeing. The pilot testing will inform a future randomised controlled trial of the intervention. Increasing social participation will likely lead to immediate benefits of reduced distress and increased wellbeing. It may also reduce the risk of developing dementia or slow its progression.

AAG RESEARCH TRUST – DEMENTIA AUSTRALIA RESEARCH FOUNDATION STRATEGIC INNOVATION GRANT

Dr Lisa Wong, Western Sydney University

The effectiveness of a co-designed and culturally adapted dementia support program for Chinese-Australian carers

Cultural barriers have been found to impact carers' access to support services, placing carers at risk of increased stress. Culturally tailored support programs are vital for maintaining carer wellbeing while also promoting inclusivity for culturally and linguistically diverse groups. Dr Wong will adapt and translate components of an existing English language Carer Support Program for Chinese carers and investigate whether the Chinese version is just as effective as the original. The Carer Support Program consists of eight weekly support sessions delivered to carers via local Chinese community services. Seven carer support groups, with up to 10 carers per group, will be involved. Dr Wong will evaluate the Carer Support Program by assessing carers' experiences and satisfaction with the program, as well as changes in their health and wellbeing measured before and after participating in the Program. This study will potentially increase carers' self-efficacy in caregiving and improve their health and wellbeing. Further, it will inform the development of culturally relevant carer support programs that address the needs and experiences of Chinese carers.

DEMENTIA RESEARCH COMMUNITY PROJECT GRANT

Dr Caitlin Finney, The University of Sydney

Precision medicine for late onset Alzheimer's disease using machine learning and human-derived 3D brain models

Late onset Alzheimer's disease (LOAD) accounts for more than 95% of Alzheimer's disease cases. Despite this, there is still have a poor understanding of what causes it. Tiny mistakes in our DNA (genetic errors) might play a role in causing LOAD. Two of these errors have been uncovered using artificial intelligence. Now the team is taking a step further in this project. The team is collecting skin cells from people who have LOAD and turning them into mini-brains in the lab. These mini-brains have different kinds of cells like neurons (the thinking cells), astrocytes (the support cells), and microglia (the cleaning crew cells). The team will use special markers to track how LOAD develops. The team will also correct these genetic errors from our mini-brains using a special tool called CRISPR-Cas9. This will let the team see if correcting these errors can stop LOAD from developing.In short, Dr Finney is trying to understand if genetic errors are causing LOAD using artificial intelligence and mini-brains. This could open doors to finding new information about LOAD and help clinicians treat LOAD in a unique way for each person, where DNA mistakes are fixed with targeted treatments. If the team finds the real reasons why LOAD happens, they could stop it or even prevent it from starting.

Dr Sian Genoud, Macquarie University

Investigating mechanisms of abnormal tau uptake and release in glia

Dementia has generally been considered as a disease of neurons. Increasing evidence, however, has identified that non-neuronal brain cells called glia actively contribute to disease progression by internalising and secreting a toxic protein, tau. Tau can then be taken up by, and damage neighbouring healthy cells by undetermined mechanisms. Dr Genoud aims to understand the role of glia in tau spread by investigating whether components of the neuronal scaffolding system called the actin-cytoskeleton, are involved in abnormal tau uptake and release. Dr Genoud will use cell models with combinations of neurons, astrocytes and microglia and alter the expression of various actin-cytoskeleton proteins using genetic manipulation and observe how these changes affect the uptake and release of tau using cellular assays, microfluidics and high-resolution microscopes. This project will provide significant understanding regarding the role of glia in tau-related dementia pathology and identify novel drug targets for the development of disease-modifying therapies to slow or halt dementia pathology. The team predict that blocking the spread of abnormal tau uptake in the brain through these pathways will help alleviate symptoms experienced by people living with dementia and ultimately slow the underlying progression of disease in the brain.

DEMENTIA AUSTRALIA RESEARCH FOUNDATION PROJECT GRANTS

Dr Adekunle Bademosi, The University of Queensland

Elucidating the role of UNC13A risk variants in sporadic frontotemporal dementia

A key pathological feature of frontotemporal dementia (FTD) diagnosis is the mislocalisation and clumping of proteins leading to neurodegeneration. In most cases, the cause of FTD is unknown. However, recent genome wide studies have identified variances in different genes that increase the risk for sporadic FTD. One such gene is UNC13A, which produces a key neuronal protein essential for neuronal communication across all eighty-six billion neurons of the brain. Interestingly, the expression of this UNC13A is also reduced in people living with FTD. It is therefore vital to understand the role UNC13A risk variants play in sporadic FTD. In this work, Dr Bademosi and the team at the University of Queensland will generate new fruit fly and roundworm animal models expressing key UNC13A genetic risk variants that increases the likelihood of sporadic FTD. The team will then investigate disease changes that occur in these models, including - locomotion, life span, and neuronal communication. Finally, the team will identify whether the beneficial effect of lithium treatment on people living with FTD who have this UNC13 risk variants is due to a direct effect of the drug on UNC13A function. Overall, Dr Bademosi aims to create sporadic FTD model organisms that can better help us understand disease onset, progression, and possible treatment.

Dr Maryam Ghahramani, University of Canberra

A pilot study on younger onset dementia detection using machine learning and the impact of a 12-week home-based exercise program for enhancing motor function in younger onset dementia

This study focuses on addressing the often-neglected condition of dementia in younger individuals. Existing tests and tools are usually used to understand and support older adults with dementia, often excluding people with younger onset dementia. The goal is to create a software application that can diagnose if a younger individual has dementia, and a new exercise regimen designed only for younger people with dementia. By recording brain and body data from both affected and unaffected individuals, Dr Ghahramani aims to understand the unique impact on younger demographics. The gathered insights will inform the development of a smart program to identify early signs of dementia in this age group. During the 12-week exercise program, the team will monitor and compare changes in brain and movement data between the exercising and non-exercising individuals with younger onset dementia. Additionally, the team will collect feedback from participants and their carers to assess the broader impact of the exercise program on their lives. In summary, this study aims to help with detecting dementia in younger people and also providing them with a special exercise program designed for their needs. Dr Ghahramani believes this can improve the quality of life of this group of people and their families.

Dr Xiaochen (Morning) Liu, The University of Sydney

The misfolding and aggregation of Huntingtin Protein: A case study of environmental effects

This study focuses on Huntington's disease, a serious brain condition that affects movement, thinking, and mood. Huntington's disease worsens over time, largely due to certain proteins in the body acting abnormally. As the disease progresses, it can lead to dementia. What's not well-known is how workplace chemicals might speed up the disease. Dr Liu is using advanced computer technology to closely examine how these chemicals interact with the Huntington's disease proteins. This method allows the team to see what happens to these proteins under different conditions, all without needing to do physical experiments. By pinpointing which environmental factors make Huntington's disease worse, the team could improve workplace safety and provide crucial information for people likely to get the disease. The discoveries might also lead to new treatments and ways to detect the disease early, greatly improving the lives of those with Huntington's disease and their loved ones.

Dr Margaret MacAndrew, Queensland University of Technology

Autonomy and safety for people living with dementia: The 3Ps approach to Getting Home Safely with dementia

The Getting Home Safely with dementia project is a three-phase program aiming to reduce the number of people with dementia who go missing and to find missing persons alive. Around 20% of police land searches involve a person with dementia; one third of these were from residential aged care (RAC) and 15% were not found alive. Inappropriate safety measures and delaying the search increases the risk of not finding missing people with dementia alive and uninjured. Phase 1 of the project generated an action plan and tested resources to achieve the program goal. In this study, Phase 2, Dr MacAndrew will action these recommendations and pilot test a new approach to getting people with dementia home safely, using the 3Ps approach - improving awareness of the risk (PREPARE), early and ongoing risk assessment (PREVENT), and policy to guide RAC response to a getting lost event (PROMPT RESPONSE). Co-design workshops will be used to adapt existing training, risk assessment, and care planning resources for the RAC context. This pilot trial will evaluate the feasibility of training staff to use the resources to evaluate an individual's walking habits, identify those at risk of getting lost, and implement care to reduce the risk. The findings will inform further refinement of resources and study design prior to Phase 3, where a trial testing the efficacy of the 3Ps approach to reduce the number of people with dementia getting lost and increase the chances of finding them alive and uninjured, will be conducted.

Dr Rossana Rosa Porto, Western Sydney University

Heat shock as an effective low-cost therapy for the prevention and treatment of Alzheimer's disease

Recent research has shown heat therapy, in the form of saunas and hot tubs, may have beneficial effects against cardiovascular disease, diabetes, obesity and depression. Sauna frequency may also have benefits for people with Alzheimer's disease. Dr Porto will build on these important findings and investigate the underlying mechanisms by which warming human body temperature may improve Alzheimer's disease-related behavioural impairments and markers of disease in the brain. Mice genetically modified to mimic symptoms of Alzheimer's disease will be divided into groups based on age, sex and treatment. Those receiving the heat treatment will be exposed to heat two times a week for two months. They will then undergo behavioural tests that assess their memory, motor function, anxiety levels, sociability and sensorimotor function. Dr Porto will then analyse their brains and blood to understand the effects of heat therapy on Alzheimer's disease-related brain changes. The findings may provide critical new markers for earlier diagnosis and shed a light on disease mechanisms that can be targeted to ease symptoms or even prevent disease progression.

DR MAREE FARROW PROJECT GRANT

Dr Edward Bliss, University of Southern Queensland

A co-designed physical activity intervention to improve cognition and cerebrovascular function in sedentary, obese older regional adults living in independent care

Cognitive decline is the primary symptom of dementia and is preceded by reduced brain blood vessel (i.e. cerebrovascular) function. Cerebrovascular dysfunction and cognitive decline are made worse by obesity and physical inactivity. These are increasingly prevalent in regional Australia and contribute to the rise in dementia, reducing quality of life of older adults. Despite physical activity being beneficial for cognition and cerebrovascular function, participation levels are sub-optimal, especially for muscle-strengthening exercises. This may be due factors such as cost, lack of gym facilities, and/or a lack of regard for the ability of the participant to perform specific exercises. Further, consumer and stakeholder engagement is not considered in the design of physical activity programs and these barriers may be overcome by co-designing physical activity programs. These barriers may be overcome by engaging consumers and stakeholders in the co-design and delivery of physical activity programs that aim to improve cerebrovascular function and cognition. Therefore, the team at University of Southern Queensland aim to undertake a pilot study that investigates the effects of a co-designed 16-week physical activity program that incorporates muscle-strengthening exercises in sedentary, obese, older regional adults who are at an increased risk of dementia. They hypothesise that a co-designed physical activity program will increase physical activity engagement and that muscle-strengthening exercises will increase cerebrovascular function and cognition. This pilot study will be the first regional Australian study to explore the use of a co-designed physical activity program in improving cognition and cerebrovascular function, thus providing a foundation for future use as a preventive treatment for dementia.

DR STUART AND BONNIE BARTLE PROJECT GRANT

Dr Amanda Cross, Monash University

Empowering consumers and healthcare professionals to make evidence-based, informed decisions regarding the pharmacological management of urinary incontinence for people living with dementia

Urinary incontinence, the accidental leakage of urine from the bladder, is extremely common among people with dementia. Urinary incontinence can cause distress and impact well-being. Many people with dementia use medications to manage their urinary incontinence. Unfortunately, the medications can sometimes harm people with dementia by worsening their memory and increasing their risk of side effects. There are no targeted resources to help people living with dementia, their families and healthcare professionals decide when to use and when to stop medications for urinary incontinence for people with dementia. The project aims to address this gap. The team will create resources that support and empower people with dementia, their families, and healthcare professionals to make well-informed choices about medications for managing urinary incontinence. The team will design these resources together with the individuals that will use the resources to ensure they are fit for purpose. The resources will be tested in residential aged care to see if they are acceptable and if they promote safe and effective continence care. The ultimate goal is to reduce medication-related harm and improve the quality of care related to the management of urinary incontinence for people living with dementia in residential aged care.

Dr Jacqueline Wesson, The University of Sydney

Functional cognition screening to detect subtle functional difficulties in everyday activities in older adults: which tool is fit for purpose?

A diagnosis of dementia or mild cognitive impairment (MCI) depends on the extent of functional decline, however, detecting early change is difficult. Cognitive changes do not automatically cause problems with functioning (or performing everyday activities), but impaired ‘functional cognition’ does. Functional cognition describes how cognitive skills are used to ‘do’ these activities, and functional cognition tests can detect subtle functional decline in ‘cognitively normal’ people (with dementia-related brain changes), mostly identified in research settings to date. Performance-based methods, where people complete everyday tasks in real life are best, but functional assessments, usually by occupational therapists (OTs), are lengthy and expensive, access to OTs is limited and not everyone needs comprehensive testing. Screening tools are an efficient, low-cost alternative. Dr Wesson will test two functional cognition screens, compare them to cognitive screens, a new computer-based tool and OT assessment, to determine the most effective approach to detecting impaired functional cognition in older people. Improved targeting of referrals for in-depth assessment and/ or interventions, support for early diagnostic processes or delaying progression, and improving quality of life are intended outcomes. In future, different healthcare professionals across settings (including rural/ remote) can test the screens, potentially providing wider surveillance of people ‘at risk’ of dementia.

HAZEL HAWKE RESEARCH GRANT IN DEMENTIA CARE

Dr Deborah Brooks, The University of Queensland

Improving the mental health of residents with dementia: Pilot-testing a Mental Health Care Indicator Tool within residential aged care homes

People living with dementia in residential care commonly experience mental health conditions. These are often not recognised, diagnosed, managed, or treated appropriately. Residential care staff usually do not receive any mental health training, and there is limited access to specialist mental health services. The Royal Commission identified a lack of mental health evaluation and treatment in residential aged care as a significant unmet need. Therefore, this project will pilot-test a newly developed Mental Health Care Indicator (MHICare) Tool within residential aged care organisations. The MHICare Tool aims to provide 1) meaningful information about current mental health care and practices and 2) opportunities to make improvements that benefit residents' mental health. The team will train staff to use the MHICare Tool and interview them about their experiences. The team will produce a report for each care home on their performance against the indicators, and deliver workshops to consider quality improvements that can help improve resident mental health outcomes. The MHICare Tool will be the first benchmarking tool developed for measuring mental health care for people living with dementia in residential aged care. Implementation may lead to improved quality of mental health care, training for staff and allocation of resources for facilities.

THE CO-GROUP PROJECT GRANT

Dr Sandra Garrido, Western Sydney University

Building the evidence for the benefits of music programs in aged care

Evidence shows that music can be effective in reducing anxiety, agitation and depression, and improving quality of life in people living with dementia. It can therefore be used as part of behaviour support plans, a requirement in aged care in Australia following the recent Royal Commission. However, aged care staff often lack knowledge and skills to use music in this strategic way. Dr Garrido's team previously co-designed an evidence-based online training for the use of music for behaviour support in aged care. The current study will evaluate the effectiveness of that training. Staff in two aged care facilities will undertake the training and be provided with equipment and support to implement personalised music playlists for residents in their care as part of behaviour support plans for those individuals over a 4-week period. Staff in two other facilities will complete the training after a wait period and serve as a control group. Pre- and post-study measures of resident mood, behaviour, medication use and quality of life will be taken, as well as pre and post measures of staff wellbeing, attitudes and approaches to caring for people with dementia. Data about changes to medication usage or staff time spent managing challenging behaviours will contribute to future cost-benefit analyses. The results will help to inform future implementation of the team's research in aged care contexts, while providing further evidence to drive systemic change towards personalised care and increased use of non-drug treatments for supporting people experiencing changes in mood and behaviour due to dementia.

THE PROVIDENCE FOUNDATION PROJECT GRANT

Dr Andrew Care, University of Technology Sydney

Cage fighting with dementia: Bioengineering protein cages into a next generation vaccine against Alzheimer's disease

Alzheimer's disease is characterised by abnormal aggregations of two proteins in the brain: β-amyloid (Aβ) and hyperphosphorylated tau (pTau). As these aggregations increase over time, so does the cognitive decline in patients. Clinically-approved Alzheimer's disease treatments are limited to intravenously administered monoclonal antibodies (mABs) that mark Aβ plaques in the brain for degradation by the immune system. However, serious concerns have been raised about the therapeutic efficacy, safety, and cost of these mABs. The goal of this project is to develop a next-generation Alzheimer's disease vaccine that simultaneously targets both abnormal Aβ and pTau. The hypothesis is that natural protein nanocages can be bioengineered to display and deliver both Aβ and pTau antigens, stimulating the body to produce its own antibodies against both targets, enabling their removal from the brain. The project will have three aims: 1) bioengineering the nanocages to display Aβ and pTau antigens; 2) evaluating the vaccine's ability to induce antibody generation against both antigens in vivo; and 3) testing the therapeutic efficacy of the vaccine in an Alzheimer's disease animal model. The significance of this project lies in the potential of active immunotherapy as a cheaper, safer, and more convenient alternative to mABs, and the use of a modular encapsulin-based vaccine for targeting multiple pathological forms of Aβ and pTau. Preliminary data shows that the team can make a nanocage vaccine that induces the production antibodies that recognises Alzheimer's disease-specific antigens. Overall, this project aims to provide an Alzheimer's disease vaccine that safe, effective, cheap and accessible to everyone.

Post-doctoral Fellowship Summaries

RACE AGAINST DEMENTIA – DEMENTIA AUSTRALIA RESEARCH FOUNDATION POST-DOCTORAL FELLOWSHIP

Dr Pradeep Manuneedhi Cholan, Macquarie University

Identifying the effects of the gut microbiome on microglial cells in Alzheimer's disease

Over the last years, a connection between a dysfunctional gut and Alzheimer's disease has been established. This is due to infection that is regulated by the microorganisms in the gut, which ultimately affect the brain. The gut is a powerful organ that can modulate the immune system. Importantly, it can be regulated non-invasively through diet and drugs, and this study aims to determine how this can be harvested in Alzheimer's disease. Dr Manuneedhi Cholan's project aims to assess the faecal microbiome of people with Alzheimer's disease and their metabolites in the progression of the disease. The team will use an in vivo preclinical platform to provide the first unequivocal evidence that the faecal microbiome of people with Alzheimer's disease can modulate immune responses in the brain. The team will further determine the specific end-products or metabolites involved in this process and aim to validate the interventions as novel treatment strategies in well-characterised Alzheimer's disease mouse models – for fastest possible clinical translation. Successful completion of this project will result in identification of how faecal microbiome and microbial metabolites are involved in modulating Alzheimer's disease. This project will implement a novel platform for gut microbiome research in the field aiding to identify gut directed therapies for Alzheimer's disease in the future.

DEMENTIA AUSTRALIA RESEARCH FOUNDATION POST-DOCTORAL FELLOWSHIP

Dr Rachael Cvejic, UNSW Sydney

Understanding responsive behaviours among people with intellectual disability living with dementia

The life expectancy of Australians with intellectual disability has increased over recent decades, resulting in a growing population of older people with intellectual disability. People with intellectual disability are more likely to develop dementia and more often at a younger age than people without intellectual disability. However, there is a lack of research focusing on the health of people with intellectual disability living with dementia. Similarly, little research has focused on understanding responsive behaviours (often called behavioural and psychological symptoms of dementia) among people with intellectual disability living with dementia. This project will use multiple research methods to: 1) describe the health and mental health conditions experienced by people with intellectual disability living with dementia; 2) identify effective approaches to understanding responsive behaviours among people with intellectual disability living with dementia; and 3) co-design accessible resources about responsive behaviours and dementia for people with intellectual disability and their supporters.

Mid-Career Research Fellowship Summaries

HENRY BRODATY MID-CAREER RESEARCH FELLOWSHIP

Dr Edwin Tan, The University of Sydney

Co-designing a personalised medicine calculator to improve antipsychotic prescribing in people living with dementia

Antipsychotics may be beneficial in addressing agitation and psychosis in dementia; however, there is a debate about their safety due to potential side effects and increased risk of mortality. Current guidelines don't provide enough personalised advice for doctors on how to decide if, and when, to prescribe antipsychotics to people living with dementia.

Dr Tan's research has a clear goal: to develop an evidence-based, personalised antipsychotic calculator to support clinical decisions for people living with dementia. This tool will assist doctors in determining suitability to prescribe antipsychotics based on consideration of specific risks and benefits at an individualised level.

The study will firstly involve analysis of national datasets, so the team understand how antipsychotics are used in Australia. The team will also interview clinicians and people living with dementia and their carers to get their views on the usefulness and risks of antipsychotics. They will then develop and test statistical models in both Australian and international datasets to predict benefits and adverse outcomes of antipsychotic prescribing. Finally, these findings will inform the codesign of the personalised antipsychotic calculator and patient education resources. By doing this, Dr Tan aims to ensure that people with dementia get the right treatment, tailored individually for them, making their lives better and safer.

ROYCE SIMMONS FOUNDATION MID-CAREER RESEARCH FELLOWSHIP AND DEMENTIA ADVOCATES AWARD

Dr Pratishtha Chatterjee, The University of Melbourne

Determining and targeting alpha-synuclein pathology in dementia with Lewy bodies and Alzheimer's disease

The accurate diagnosis of dementia with Lewy bodies is challenging particularly in its early stage. In dementia with Lewy bodies, abnormal clumps of alpha-synuclein (aS) are present in the brain cells. In some people with Alzheimer's disease, these aS clumps co-exist in the brain cells along with typical Alzheimer's disease protein abnormalities. Recent evidence indicates co-existence of aS clumps with typical Alzheimer's disease protein abnormalities accelerates impairment of a person's thinking abilities. Therefore, detection of aS clumps is not only important for dementia with Lewy bodies but also for Alzheimer's disease. The presence of aS clumps is detectable in dementia with Lewy bodies and Alzheimer's disease using spinal fluid, however spinal taps required for spinal fluid collection are invasive. Therefore, this project aims to identify unique blood patterns reflecting aS clumps in dementia with Lewy bodies and Alzheimer's disease via a technique called proteomics. The aS clumps also disrupt transmission of messages in the brain. Dr Chatterjee aims to identify compounds that will prevent or reduce formation of aS clumps. This will be done by conducting drug repurposing screens for drugs that already have regulatory approval for other diseases, as an initial step towards the development of a therapeutic strategy to halt

further aS clumping. This project will ultimately influence accurate and timely diagnosis for precision medicine in dementia with Lewy bodies and Alzheimer's disease and take an initial step towards identifying therapeutic agents against aS clumping.

ROYCE SIMMONS FOUNDATION MID-CAREER RESEARCH FELLOWSHIP

Dr Luke Gray Whiley, Murdoch University

Advancing the understanding of genetic risk in sporadic Alzheimer's disease by elucidating the metabolic consequences of ABCA7 polymorphisms

Alzheimer's disease is the most common type of dementia, but it remains unknown as to exactly why it occurs. Whilst variation in our genetics have been identified that increase the risk of developing the disease, the reasons behind this are yet to be uncovered. This lack of knowledge is especially important in genetic variants that are common in the population. An example is ABCA7, with one in six people carrying a variation in the ABAC7 gene that increases their risk of developing Alzheimer's disease by 20%. However, before links between ABCA7 genetic variation and Alzheimer's disease can be understood, there is first a need to uncover the impact that ABCA7 variation has on a person's everyday biological function. Currently this is not the case, with such variation having no obvious effect on our biology. The project will generate foundation knowledge that describes the influence that ABCA7 variation has on everyday biology. This will be achieved by analysing data from a population study that describes both ABCA7 genetic information alongside blood measurements representative of a person's core biology, this will reveal the biological processes that are altered with ABCA7 genetic variation. The knowledge generated will form the foundation groundwork required to further understand the biological factors that contribute to a person's risk of ABCA7-associated Alzheimer's disease. Downstream, this will uncover future opportunities for researchers to develop medical interventions to mitigate ABCA7 risk variants and to prevent or delay Alzheimer's disease.

Travel Grant Summaries

Dr Leila Akbari, Macquarie University

Unravelling molecular mechanisms of Tau propagation through the use of microdialysis

Alzheimer's disease is a complex condition marked by memory loss and the buildup of Tau protein in the brain. To address the urgent need for effective interventions, Dr Akbari's research focuses on comprehending how Tau spreads throughout the brain. Using an advanced technique called microdialysis, the aim is to collect and analyse proteins, including Tau, in the brain's fluid. This approach is crucial for enhancing our understanding of the progression of Alzheimer's disease. The significance of this research lies in its potential to unlock new insights into the disease, paving the way for early detection and intervention strategies. The proposed travel aims are to optimise the microdialysis setup. This collaboration in Japan is vital for expanding Australian expertise in this field and establishing the first in vivo Microdialysis setup for rodent brain sampling. Through this journey, Dr Akbari aspires to contribute significantly to the overall project outcomes, bringing us closer to unravelling the mysteries of Alzheimer's and making strides toward effective treatments.

Dr Marianne Coleman, The University of Melbourne

Helping dementia-friendly eyecare to happen everywhere

People living with dementia are less likely to access eyecare, and experience greater risk of preventable sight loss. The team conducted pioneering research to break down barriers to accessing dementia-friendly eyecare, finding that people with dementia and carers have mixed eye test experiences. Optometrists wanted to know more about dementia to help them provide high quality eyecare. To address this, the team developed an online training course about dementia-friendly eyecare for optometrists, informed by the team's research and guided by people with a lived or living experience of dementia (Dementia Advocates). Dementia-friendly eyecare should be available everywhere. However, many countries lack eyecare pathways that support people with dementia, and tailored dementia training for eyecare professionals. To develop global research impact, Dr Coleman will present the team's training course development, and share key messages from the research for an international audience at the 2024 Alzheimer’s Disease International Conference in Europe. The abstract is co-authored with Dementia Advocates, and will be co-presented. To maximise this travel opportunity, Dr Coleman will also present this work at UK eyecare training schools, reaching the next generation of eyecare professionals. The UK has a similar community eyecare model to Australia, and Dr Coleman has maintained strong links there. This travel fosters international collaborations to integrate dementia-friendly eyecare into future student training.

Dr David Foxe, The University of Sydney

Evolving motor features in primary progressive aphasia: insights from event-based modelling

Primary progressive aphasias (PPA) are rare, incurable, younger-onset dementias that primarily affect speech and language abilities. There are three main subtypes of PPA, each with distinct language profiles, patterns of brain atrophy (or shrinkage), brain pathologies, and prognoses. While most research has concentrated on the distinct language problems, the team have observed that individuals with PPA develop additional symptoms beyond the language disorder. Importantly, some individuals with PPA experience minor movement (motor) problems, such as slow or rigid movements. In certain cases, these movement issues can progress, resembling a Parkinson's plus syndrome (a syndrome clinically related to Parkinson's disease). A lack of understanding of these changes makes it challenging for clinicians to provide patients with the right (or relevant) care services at the right time. This research aims to address these issues. It will utilise a novel event-based modelling technique to determine the prevalence and sequential development of motor symptoms across the PPA subtypes. This travel award provides a unique opportunity to travel to the UK, work closely with distinguished PPA experts at the University of Cambridge, access their extensive datasets, and gain proficiency in a novel statistical method (event-based modelling) to comprehensively understand the evolution of motor dysfunction in PPA.

Dr Helen Macpherson, Deakin University

Food for thought: How does diet influence dementia risk?

A good quality diet makes a vital contribution to healthy ageing and influences dementia risk factors such as heart health, obesity and type 2 diabetes. To provide clear guidelines around the optimal diet for protecting brain health, there is a need to better define which type of diet is most protective against developing dementia and which are the best ways to measure diet. This travel grant will be used to undertake a series of visits to key research groups in Europe to develop strong collaborations to better understand how diet influences dementia risk. This will be achieved by accessing European data and applying for international funding opportunities relevant to dementia prevention. An important goal of this this travel is to create opportunities to contribute Dr Macpherson's expertise around diet to International dementia risk reduction and brain health guidelines. The research informed by these visits will provide a better understanding of the contribution that diet plays in reducing dementia risk. This will lead to the development of more effective interventions to reduce dementia risk and more precise public health messaging.