Dementia Australia™
Research Foundation

2021 Dementia Grants Program

Project Grants*

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
AAG Research Trust – Dementia Australia Research Foundation RM Gibson Grant		
Dr Dana Pourzinal†	Confirming prognostic validity of the dual syndrome hypothesis of dementia in relation to Parkinson's disease	The University of Queensland
AAG Research Trust – Dementia Australia Research Foundation Strategic Innovation Grant		
Dr Josefine Antoniades‡	Moving Pictures GENIE on-line to support Culturally and Linguistically Diverse family carers of persons living with dementia	National Ageing Research Institute
Bondi2Berry Project Grant		
Dr Leah Beauchamp	Protein phosphatase 2A methylation as a therapeutic target in Alzheimer's disease	Florey Institute of Neuroscience and Mental Health
Dr Dorothy Wai	Developing potent and brain-permeable peptide therapeutics for Alzheimer's disease	Monash University
Dementia Australia Research Foundation Project Grant		
Dr Deborah Brooks	Towards better mental health of people living with dementia in Residential Aged Care: Co-design of a performance measurement tool to aid organisational governance	The University of Queensland
Dr Marina Cavuoto	The influence of the Aquaporin-4 gene on the relationship between poor sleep and preclinical dementia: A multi-cohort study	Monash University
Dr Rose Chesworth	Inflammation and basal forebrain cholinergic degeneration exacerbate tau pathology - a new approach to Alzheimer's disease aetiology and treatment	Western Sydney University
A/Prof Helen English	Designing evidence-based creative arts programs to maintain healthy brains and minds in older adults	The University of Newcastle
Dr Anna Konopka	Understanding the causes of DNA damage in dementia associated with abnormal TDP-43	Macquarie University
Dr Andrew Shoubridge	Targeting of host-microbiome interactions to achieve precision in dementia risk reduction	South Australian Health and Medical research Institute
Dr Louisa Smith	Rainbow Connections: Co-designing training and engagement resources to help community visitors to make and maintain social connections with LGBT+ people with dementia	Deakin University

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Dementia Australia Research Foundation – Norma Beaconsfield Project Grant		
Dr Grace Lidgerwood	Modelling Alzheimer's disease using a novel stem cell model of the human retina	The University of Melbourne
Dementia Australia Research Foundation – Victoria Project Grant		
Dr Paul Jansons	Feasibility and pilot randomised controlled trial of a co-designed home-based personalised rehabilitative strategy program delivered via Voice-Controlled Intelligent Personal Assistants in older adults aged 60 years and older with mild cognitive impairment and/or dementia	Deakin University
Dementia Centre for Research Collaboration Pilot Grant		
Dr Sau Chi Cheung	Supporting changed behaviours: Positive behaviour support in younger-onset dementia	The University of Sydney
Dr Marina Pinheiro	A physiotherapy-led telehealth and exercise intervention to improve mobility in older people receiving aged care services: an effectiveness and implementation randomised controlled trial (The TOP UP Study)	The University of Sydney
Dr Bridget Regan	Improving the communication of dementia diagnoses: A pilot study	La Trobe University and Eastern Health
Dr Mouna Sawan	Evaluating organisational culture of Residential Aged Care Facilities to reduce the inappropriate use of psychotropic medications in residents living with dementia	The University of Sydney
Hazel Hawke Research Grant in Dementia Care		
Dr Nathan D'Cunha	Evaluation of a multicomponent post-diagnostic support program for people living with dementia and their carers	University of Canberra

* Valued at $75,000 over 1-2 years. Funding commences in 2022.
† Valued up to $7,000 over 1.5 years. Funding commenced in 2021.
‡ Valued up to $30,000 over 1.5 years. Funding commenced in 2021.

Post-doctoral Fellowships*

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Dementia Australia Research Foundation Post-doctoral Fellowship		
Dr Louise Lavrencic	Understanding relationships between neuroimaging markers and culturally relevant protective factors in Aboriginal communities: A way to enhance dementia prevention and diagnosis?	Neuroscience Research Australia and University of New South Wales
Dementia Centre for Research Collaboration Post-doctoral Fellowship		
Dr Lidia Engel†	The COCOON research project: incorporating Carer Outcomes in COst-effectiveness analyses Of dementia iNterventions	Monash University
Dr Claire O'Connor	Bridging the implementation gap: maximising everyday function for people with dementia	University of New South Wales
Race Against Dementia – Dementia Australia Research Foundation Post-doctoral Fellowship		
Dr Karissa Barthelson	Adult- and childhood-onset dementias: Related causes and related solutions?	Flinders University
Scientia Professor Henry Brodaty Post-doctoral Fellowship		
Dr Kristie Stefanoska	Master sites of tau phosphorylation as treatment targets for Alzheimer's disease	Flinders University

* Valued at $405,000 over 3 years. Funding commences in 2022.
† Valued at $300,000 over 2 years. Funding commences in 2022.

Mid-Career Research Fellowships*

LEAD INVESTIGATOR	PROJECT TITLE	INSTITUTION
Dementia Australia Research Foundation Mid-Career Research Fellowship		
Dr Liviu-Gabriel Bodea	Rejuvenating microglia to alleviate Alzheimer's disease	The University of Queensland
Dr Janet van Eersel	Pre-clinical development of next-generation tau aggregation-inhibitors for the treatment of dementia	Macquarie University
Dementia Centre for Research Collaboration Mid-Career Research Fellowship		
Dr Moyra Mortby	Understanding Neuropsychiatric Symptoms to inform timely diagnosis, patient management and lived experience of dementia	University of New South Wales
A/Prof Lyn Phillipson	Communities for dementia	University of Wollongong

* Valued at $365,000 over 2 years. Funding commences in 2022.

We thank our key donors and partners who have supported this research, including the Australian Association of Gerontology, Bondi2Berry, Dementia Centre for Research Collaboration, Lucas Papaw Remedies, Mostyn Family Foundation, Norma Beaconsfield, Race Against Dementia and The Co-Group.

Project Grant Summaries

AAG RESEARCH TRUST – DEMENTIA AUSTRALIA RESEARCH FOUNDATION RM GIBSON GRANT

Dr Dana Pourzinal, The University of Queensland

Confirming prognostic validity of the dual syndrome hypothesis of dementia in relation to Parkinson's disease

The Dual Syndrome Hypothesis suggests that there are two distinct cognitive subtypes within Parkinson's disease; a frontal and posterior-cortical subtype. The posterior-cortical subtype is suggested to be susceptible to a more rapid and severe decline toward dementia than the frontal syndrome. Yet concrete evidence to validate the trajectory of these subtypes is limited. The aim of this project is to identify the frontal and posterior subtypes using machine learning methods and determine whether the predictions of the dual syndrome hypothesis hold true. Does the posterior-cortical subtype truly show more rapid cognitive decline over time than the frontal syndrome? By identifying cognitive subtypes in independent samples and following their cognitive progression, the clinical significance of the dual syndrome hypothesis will be validated and, the cognitive subtypes most at risk of imminent dementia can be identified. Findings will contribute to future exploration of biomarkers of dementia in Parkinson's disease and optimise clinical trial efficiency. Ultimately, this will contribute to the overall goal of biomarker development and preventative medicine for dementia in Parkinson's disease

AAG RESEARCH TRUST – DEMENTIA AUSTRALIA RESEARCH FOUNDATION STRATEGIC INNOVATION GRANT

Dr Josefine Antoniades, National Ageing Research Institute

Moving Pictures GENIE on-line to support Culturally and Linguistically Diverse family carers of persons living with dementia

Disasters such as the COVID-19 pandemic pose significant challenges for Culturally And Linguistically Diverse (CALD) family carers and people living with dementia. This is because infection control measures imposed to curb the spread of COVID-19 have reduced access to health care, in-home services, and social interactions. These measures have been associated with worsening of dementia symptoms including increased behavioural and psychological symptoms. As a result, many CALD family carers, already experiencing poor mental health than their non CALD counterparts, have reduced access to support and greater care challenges to grapple with on a daily basis in the context of a serious pandemic. Responding to these challenges, this project will co-produce with CALD family carers and service providers, the GENIE (Global dEmeNtIa rEsources): a world-first global online repository of dementia resources for CALD family carers caring for people living with dementia. GENIE leverages the national Moving Pictures project, which raises dementia awareness in CALD communities using film and digital media. It does this by mobilising established partnerships to undertake an environmental scan and expert consultation of existing resources, co-producing GENIE with CALD family carers, and locating GENIE on the mobile-optimised Moving Pictures website. Thus, GENIE is a user-friendly, digital repository of evidence-based, culturally appropriate, and in-language resources about dementia and dementia

care which will make access to digital information and support easier for CALD family carers of people living with dementia.

BONDI2BERRY PROJECT GRANT

Dr Leah Beauchamp, The Florey Institute of Neuroscience and Mental Health

Protein phosphatase 2A methylation as a therapeutic target in Alzheimer's disease

The impact that Alzheimer's disease has on the minds and lives of the population is evident and there is desperate need for drugs that are safe and effective. There are failures in biochemical processes in the Alzheimer's disease brain, and as this disease progresses there is an accumulation of a protein called tau that becomes toxic. Tau is a protein that is needed throughout life, however, in Alzheimer's disease it changes and becomes 'sticky', causing the protein to aggregate in our brain cells. Over time these protein aggregates give way to a range of toxic pathways that build up over time resulting in what is known as dementia. This research will develop strategies that correct this biochemical failure leading to toxic tau aggregates. Several new drugs that will promote the stability of 'good tau' have been designed. A compound that can reduce the dynamic process that turns 'good tau' into 'bad tau' has also been designed. This work aims to create new therapies that specifically target tau and help to reduce the burden of these protein aggregates in the brain leading to better brain health as people age.

Dr Dorothy Wai, Monash University

Developing potent and brain-permeable peptide therapeutics for Alzheimer's disease

There remains an urgent and unmet need for novel Alzheimer's disease therapeutics, with a limited number of drugs currently approved in Australia to treat symptoms of Alzheimer's disease, and none that are able to slow its progression. One reason that drug candidates are ultimately ineffective against Alzheimer's disease may be that insufficient drug reaches brain cells from the bloodstream, due to the tight barrier formed by blood vessels within the brain. This research aims to engineer an Alzheimer's disease drug that can bypass this barrier and enter the brain efficiently. Pervious work as seen the development of HsTX1[R14A], a drug candidate that selectively targets microglia, the immune cells of the brain, by blocking a protein that is overactivated on these cells. This suppresses the inflammatory properties of microglia and promotes their ability to clear toxic proteins that build up in the brain in Alzheimer's disease. By attaching 'shuttle' molecules to HsTX1[R14A], which allow HsTX1[R14A] to enter the brain more easily, this project aims to deliver a therapeutically effective drug dose to the brain (as tested in a mouse model). Together with its high efficacy and low toxicity, HsTX1[R14A] would be a highly promising lead molecule for development as a next-generation drug for Alzheimer's disease.

DEMENTIA AUSTRALIA RESEARCH FOUNDATION PROJECT GRANT

Dr Deborah Brooks, The University of Queensland

Towards better mental health of people living with dementia in Residential Aged Care: Co-design of a performance measurement tool to aid organisational governance

Mental health practices for people living with dementia in residential care are often poor, with an increased risk of prescribing medication for those who experience psychological symptoms and changed behaviours such as agitation. Additionally, psychological, social and person-centred care can be poorly implemented. The COVID pandemic has exacerbated existing concerns about the mental health of residents. However, there is currently no measure to monitor and promote mental health for people living with dementia in residential care. This study aims to improve current practices and outcomes for people living with dementia in residential care by co-designing a performance measurement tool for use in care facilities. Residents both with and without a diagnosis of dementia, family/care partners and residential care staff, will be asked about the key areas that need to be addressed and measured to improve mental health practices and outcomes. A consensus between the aged care industry, consumer organisations, academics, and clinicians on the quality indicators to be included, will be sought. This project will co-design a Mental Health Tool for Residential Aged Care (MHICare Tool) that can eventually be rolled out across residential aged care facilities in Australia to improve mental health practices and outcomes for residents.

Dr Marina Cavuoto, Monash University

The influence of the Aquaporin-4 gene on the relationship between poor sleep and preclinical dementia: A multi-cohort study

Poor sleep can contribute to dementia by disrupting the brain’s ability to remove toxic waste products that contribute to the development of Alzheimer's disease and other causes of dementia. The Aquaporin-4 (AQP4) gene plays an important role in the capacity of the brain to “flush out” waste. However, little is understood about the role of the AQP4 gene in the association between sleep and dementia. This could be crucial in identifying who would benefit most from sleep treatments designed to prevent dementia. This study aims to investigate whether people with different variants of the AQP4 gene are more at risk of cognitive decline and early dementia biomarkers in the face of poor sleep. This will be done by looking at genetic sequencing in three different cohorts and comprehensively assessing sleep, and early dementia biomarkers, as well as cognitive assessments over time. The results of this research will identify whether certain people are at higher risk of negative brain health associated with poor sleep.

DEMENTIA AUSTRALIA RESEARCH FOUNDATION PROJECT GRANT

Dr Rose Chesworth, Western Sydney University

Inflammation and basal forebrain cholinergic degeneration exacerbate tau pathology - a new approach to Alzheimer's disease aetiology and treatment

The cause of Alzheimer's disease is unclear and there is a significant need for better treatment options. Inflammation in the brain (i.e. neuroinflammation) is an established hallmark of Alzheimer's disease, however, it is unclear precisely what role neuroinflammation plays in the disease. This project will explore the theory that neuroinflammation exacerbates other pathological aspects of Alzheimer's disease and that these complex interactions present a new treatment avenue. The hypothesis will be tested using a novel mouse model that combines neuroinflammation with Alzheimer's disease pathology. A novel treatment for neuroinflammation, Alzheimer's disease pathology and cognitive impairment in a mouse model will also be examined. This research will determine if interactions between neuroinflammation and Alzheimer's disease pathology are a critical component of Alzheimer's disease aetiology, and if these interactions could be a new treatment target.

Associate Professor Helen English, The University of Newcastle

Designing evidence-based creative arts programs to maintain healthy brains and minds in older adults

Keeping active in later life is important for maintaining social, cognitive and emotional wellbeing, and delaying or preventing the onset of dementia. While physical activity can promote wellbeing in older adulthood, not everyone can participate in sports or exercise. Creative arts activities offer a promising, complementary approach to engage our thinking, emotions, creativity and imagination. While engagement in creative activities is linked to beneficial effects on wellbeing, research into the specific effects of creative arts engagement on brain and cognitive health is lacking. This project uses a cluster randomised control trial design to compare the effects of artmaking and songwriting courses on brain, cognitive and emotional processes in healthy older adults. The aim of this project is to identify the important 'ingredients' of creative activity programs that drive benefits in wellbeing. Findings from this project will inform the development of evidence-based creative arts programs with protective effects on cognitive functioning, emotional wellbeing and quality of life for adults at all stages of ageing.

Dr Anna Konopka, Macquarie University

Understanding the causes of DNA damage in dementia associated with abnormal TDP-43

DNA carries genes that define any living being. The genes are essential for function of the whole organism but they are damaged everyday due to normal cellular processes and exposition to toxic agents. Therefore, efficient DNA repair mechanisms are crucial for the proper functioning of genes and the maintenance of healthy cells. Abnormal accumulation of DNA damage actively contributes to neurodegeneration in Alzheimer's disease and frontotemporal lobar degeneration (FTLD), the two most common causes of dementia. However, precise mechanism underlining this phenomenon is unknown. In both, Alzheimer' and FTLD, abnormal protein called TDP-43 is

present. Interestingly, recently it was discovered that TDP-43 repairs DNA. Given that DNA is damaged in dementia and TDP-43 does not work properly, defective DNA repair may be a potential cause of the disease. This project will investigate how abnormal TDP-43 damages DNA in dementia in order to repair this mechanism and therefore treat dementia. Because damage to DNA targets genes, the project also aims to identify these genes. This information will provide better understanding of the causes of dementia and will also pave way for the establishing new therapeutic strategies for dementia.

Dr Andrew Shoubridge, South Australian Health and Medical Research Institute

Targeting of host-microbiome interactions to achieve precision in dementia risk reduction

Despite dementia being an important cause of disability and dependency in older age, it is not currenlty possible to identify those individuals who are at high risk before the development of symptoms. This means that early support is limited, and that opportunities to prevent or delay the onset of disease are missed. Healthy gut microbiology can help to prevent inflammation that contributes to dementia risk. Previous work has shown that features of intestinal microbiology are associated with dementia severity. This study aims to better understand these relationships by connecting gut microbiology and inflammatory features with clinical signs of dementia in South Australians diagnosed with dementia through the Australian Dementia Network. In addition, this project will develop strategies to reduce risk and prevent or delay onset, both by informing effective public health measures and through the development of new therapies that target gut microbiology or immune regulation. This study will also be facilitated by the creation of a collaborative South Australian dementia care group that will integrate the laboratory, clinic, and community. This group will engage with existing and new stakeholders and help to shape an initiative that enhances dementia research and care.

Dr Louisa Smith, Deakin University

Rainbow Connections: Co-designing training and engagement resources to help community visitors to make and maintain social connections with LGBT+ people with dementia

Lesbian, Gay, Bisexual and Transgender (LGBT+) people with dementia have diverse and complex support needs. Previous research shows that after lifetimes of discrimination, LGBT+ people with dementia often do not have families they can rely on and do not want to use health or aged care services because of bad experiences in the past. This lack of access to supports makes volunteer community visitors crucial to the health and wellbeing of LGBT+ people with dementia. The national Community Visitors Scheme (CVS) – funded by the Australian Government – supports volunteers to foster friendship, companionship and connections by visiting socially isolated older LGBT+ people. But the growing numbers of LGBT+ people living with dementia present a particular challenge for the CVS. Organisations that support community visitors for LGBT+ older people around the country recognise that suspected or diagnosed dementia often makes visiting more challenging. Supporting the capacity of visitors to continue visiting LGBT+ people with dementia are the goals that drive this project. This project will develop resources to support community visitors to make and maintain connections, friendships, and companionship with LGBT+ people living with dementia. The implications for this project are that it will not only increase capacity of community visitors to LGBT+ people with dementia, but also provide resources for all community visitors visiting people with dementia around Australia.

DEMENTIA AUSTRALIA RESEARCH FOUNDATION – NORMA BEACONSFIELD PROJECT GRANT

Dr Grace Lidgerwood, The University of Melbourne

Modelling Alzheimer's disease using a novel stem cell model of the human retina.

A common feature of Alzheimer's disease are plaques of protein in the brain called beta amyloid (Aβ) which can appear decades before the first symptoms of dementia are observed. The retina, which is the light sensing tissue of the eye, is an extension of the brain and thus a "window" into the health of the brain. Recent research has found that the Aβ load in the brains of people with Alzheimer's disease correlates with levels detected in the retina, heralding an exciting avenue of clinical research for non-invasive detection of the disease. It is now possible to study the molecular events that underpin Alzheimer's disease in the laboratory using a patient's very own stem cells (called induced pluripotent stem cells or iPSCs). Using iPSCs from patients with clinically diagnosed Alzheimer's disease, this study aims to create the first lab-based retinal model of Alzheimer's disease. Using a range of cutting-edge technologies, this project will aim to develop a robust model that can ultimately be used for drug screening, to identify therapeutics that inhibit or reverse Aβ-mediated damage in the retina. Findings from this study may provide new avenues for Alzheimer's disease research and therapeutic discovery.

DEMENTIA AUSTRALIA RESEARCH FOUNDATION – VICTORIA PROJECT GRANT

Dr Paul Jansons, Deakin University

Feasibility and pilot randomised controlled trial of a co-designed home-based personalised rehabilitative strategy program delivered via Voice-Controlled Intelligent Personal Assistants in older adults aged 60 years and older with mild cognitive impairment and/or dementia

A personalised cognitive strategy program delivered by an Amazon Alexa Echo Show 8 (Alexa) using natural conversations may be more acceptable than some of the traditional digital health approaches such as internet browsers, tablets and smart phones. Alexas present an ideal method to deliver personalised strategies such as medication/appointment reminders or assist people with mild cognitive impairment (MCI) and dementia to carry out activities of daily living such as meal preparation, as they can be automated to provide voice reminders and instructions which can prompt users to carry out scheduled activities throughout the day, and enable regular feedback to the prescribing health professional. A co-designed 12-week trial of a home-based personalised rehabilitative strategy program delivered via an Alexa in older adults aged 60 years and older with MCI and/or dementia, will be conducted. It is anticipated that the program will be feasible, acceptable, reduce depression and improve cognition and activities of daily living compared to a control group. Data from this project will explore the delivery of this project to reduce healthcare inequalities in people with dementia by providing high quality and cost-effective services to underserved populations, such as low-income individuals and people in remote and rural areas.

DEMENTIA CENTRE FOR RESEARCH COLLABORATION PILOT GRANT

Dr Sau Chi Cheung, The University of Sydney

Supporting changed behaviours: Positive behaviour support in younger-onset dementia

Changed behaviours (e.g., aggression, socially-inappropriate behaviours) commonly occur in younger-onset dementia which typically affects people below the age of 65 years. These changed behaviours can have significant negative impacts on the person with dementia and their families such as reduced quality of life and increased stress for family carers. Medication is currently the most common intervention, though is often ineffective and causes side effects. Although behaviour support interventions, such as Positive Behaviour Support (PBS) are most effective, there is a serious lack of options for these in Australia. Through five weekly education sessions, questionnaires and interviews, how acceptable and useful a family-directed PBS education program is in equipping family carers with more effective behaviour support will be examined. This project will equip carers with the relevant skills to manage changed behaviours on a day-to-day basis, and thus reduce the negative impacts of changed behaviours. The project will also examine the effectiveness of online delivery and develop facilitator guidelines to increase our ability to reach families supporting a person with dementia across Australia, particularly in regions with limited services. It is anctipated that the program will improve dementia care in the community and the services available for families supporting a person with dementia with changed behaviours.

Dr Marina Pinheiro, The University of Sydney

A physiotherapy-led telehealth and exercise intervention to improve mobility in older people receiving aged care services: an effectiveness and implementation randomised controlled trial (The TOP UP Study)

Dementia results in cognitive decline, reduced balance and poor mobility. People living with dementia fall twice as often and are three times more likely to break bones and die. A physiotherapist can help older people improve their balance and walking. Older people need to do two hours of balance and strengthening exercise per week to reduce their falls risk and maintain their level of independence. This is a challenge in aged care as there are not enough physiotherapists and staff to assist older people with dementia to exercise safely. COVID-19 has exacerbated the situation by restricting physiotherapist’s ability to visit people. Telehealth is emerging as a new way to allow people living with dementia to ‘see’ their physiotherapist online. The effect and acceptability of a telehealth physiotherapy programs on mobility and falls in people living with dementia will be evaluated in order to understand how to use technology to improve the quality of life for this vulnerable population. If the trial is effective, the program could be rolled out to the aged care industry and assist older people living with dementia to maintain their function and independence for as long as possible.

Dr Bridget Regan, La Trobe University and Eastern Health

Improving the communication of dementia diagnoses – A pilot study

Neither communicating nor receiving a diagnosis of dementia is an easy process. Studies have shown that good communication can help to mitigate negative outcomes such as poor treatment decisions and reduced psychological adjustment. Research has highlighted the key features of dementia diagnoses communication that help improve outcomes for people with dementia and carers. Such features include demonstrating compassion, considering how directly to disclose, offering opportunities for questions, providing hope, demonstrating awareness and managing dynamics between people with dementia and carers, and providing written information to support understanding. This study aims to (a) review the strategies in place in three multidisciplinary memory clinics and (b) pilot and evaluate an intervention to improve dementia diagnoses communication in these clinics. Data collection will involve sampling the experiences of clients, carers, and clinicians at feedback sessions before and after the intervention. It will also involve both comparison of numerical results and an analysis of themes raised by people with dementia, carers, and clinicians pre and post intervention. The results of this study are expected to confirm the benefits of diagnostic communication training and contribute to future development of guidelines in delivering a dementia diagnosis.

Dr Mouna Sawan, The University of Sydney

Evaluating organisational culture of Residential Aged Care Facilities to reduce the inappropriate use of psychotropic medications in residents living with dementia

Psychotropic medications (i.e., medications that can act on the brain) are often used to treat changed behaviours related to dementia. Inappropriate use (where the actual or potential harms of therapy outweighs the benefit for the individual) of psychotropic medications is particularly high among older adults living with dementia in residential aged care facilities (RACFs). The usage rates vary among RACFs, and the organisational culture is an important contributor. This proposal aims to validate an organisational culture evaluation tool so that RACFs providers can identify the tailored strategies needed to support the appropriate use of psychotropic medications in residents living with dementia. For this work, the research team will be partnering with aged care stakeholders, including people living with dementia and their carers to provide feedback on the tool. RACF staff and healthcare professionals will also be recruited to participate in a survey to ensure that items in the tool measure what it is intended to measure and enable scoring of the tool to provide feedback to RACF providers. The research project will provide a validated, user-friendly tool to evaluate RACF organisational culture to support the appropriate use of psychotropic medications in people living with dementia.

HAZEL HAWKE RESEARCH GRANT IN DEMENTIA CARE

Dr Nathan D'Cunha, University of Canberra

Evaluation of a multicomponent post-diagnostic support program for people living with dementia and their carers

The availability and accessibility of post-diagnostic support for people living with dementia and carers is of central importance in dementia care. People with dementia and their carers require access to timely education, emotional and practical support, lifestyle advice, and meaningful activities, to maximise their quality of life and to potentially delay cognitive decline. Allied health professionals at Canberra Health Services at the University of Canberra Rehabilitation Hospital and the University of Canberra have designed an evidence-based 12-week multicomponent program, tailored to people with dementia and carers, which includes physical activity, social engagement, nutrition assessment, education, and capacity building. The team engaged with Dementia Australia advocates to refine the program and set priorities for research. The research project will assess the value of the multicomponent dementia support program, perform a pilot study to measure impact and effectiveness, and explore barriers to access to post-diagnostic dementia support services for people with dementia and carers. The project has the potential to become part of standard care in the ACT region, and to set an example for dementia care services Australia-wide.

Post-doctoral Fellowship Summaries

DEMENTIA AUSTRALIA RESEARCH FOUNDATION POST-DOCTORAL FELLOWSHIP

Dr Louise Lavrencic, University of New South Wales

Understanding relationships between neuroimaging markers and culturally relevant protective factors in Aboriginal communities: A way to enhance dementia prevention and diagnosis?

Research has shown higher dementia rates in Aboriginal and Torres Strait Islander communities compared to the broader population; however, there has been no study on underlying brain changes. Furthermore, lifecourse exposures (e.g., education, work opportunities) may be protective even when dementia-related disease/injury are present; yet little is understood about these relationships for Aboriginal and Torres Strait Islander people and how they predict cognitive function over time. This study aims to investigate relationships between brain structure and protective factors that contribute to healthy ageing and delay/prevent dementia; and will follow-up participants to predict cognitive outcomes. The project will involve co-developing a culturally relevant measure that captures protective lifecourse exposures. Two-hundred older Aboriginal and Torres Strait Islander people will then have Magnetic Resonance Imaging (MRI) scans. MRI brain structure measures will be examined in relation to the protective lifecourse exposure measure, to understand how they are related. This project will also develop a way to assess cognition via telephone or video conference, to easily follow up MRI participants one year later and investigate how the brain and protective factors predict cognitive decline. This project will inform culturally meaningful dementia prevention strategies and enhance dementia diagnosis for Aboriginal and Torres Strait Islander peoples.

DEMENTIA CENTRE FOR RESEARCH COLLABORATION POST-DOCTORAL FELLOWSHIP

Dr Lidia Engel, Monash University

The COCOON research project: incorporating Carer Outcomes in COst-effectiveness analyses Of dementia iNterventions

Providing informal care to a person living with dementia is not only associated with significant costs but there can also be significant quality of life impacts for informal carers. However, these impacts are rarely considered when assessing the cost-effectiveness of dementia interventions, leading potentially to sub-optimal resource allocation decisions. The aim of the COCOON research project is to advance the methods used when assessing the cost-effectiveness of dementia interventions by incorporating carer outcomes. This Fellowship will develop, with input from an advisory group, a new dementia-specific questionnaire to measure quality of life of informal carers, which will be tested for its appropriateness and performance in informal carers. A way of scoring this new questionnaire that will account for the fact that some domains of quality of life are valued more than others will then be developed. In the final part of the Fellowship, how carers' quality of life can be combined with care recipients' quality of life will be assessed, by obtaining preferences from the Australian general population in terms of whether they should be weighted differently. Findings from this research project will enable the inclusion of carer outcomes in future cost-effectiveness analyses, leading to more equitable and efficient resource allocation decisions.

Dr Claire O'Connor, University of New South Wales

Bridging the implementation gap: maximising everyday function for people with dementia

One in 10 Australians aged 65 years or over have dementia, a leading cause of progressive disability. The Royal Commission into Aged Care recommends enabling interventions such as occupational therapy and exercise to support ability to do everyday activities, and people living with dementia want access, but these interventions are not being offered in usual dementia care. This research seeks to understand how to overcome barriers to successfully delivering enabling interventions within the real-world setting of existing community aged care service providers using available Commonwealth funding sources. In parallel, the project aims to explore whether meaningful outcomes can be achieved for people living with dementia participating in enabling interventions. In partnership with an advisory group (people impacted by dementia and industry stakeholders), this project will: (1) explore current practice (clinical audit); (2) seek national input on strategies for how to deliver enabling interventions within community aged care services; (3) test these strategies and explore program outcomes for people with dementia; and (4) develop a national guide on how to deliver enabling programs to support everyday abilities in people living with dementia accessing community aged care services. Outcomes have potential to improve the national landscape of services offered to Australians living with dementia.

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

Dr Karissa Barthelson, Flinders University

Adult- and childhood-onset dementias: Related causes and related solutions?

To date, the complexity of Alzheimer's disease has been difficult to completely capture in animal models. Consequently, treatments originally developed in animals are not particularly effective in all Alzheiemer's disease cases. To discover alternative Alzheimer's disease therapies, a different approach is required. Dementia is not only a disease of the elderly. 1 in 2,800 Australian babies will develop childhood-onset dementia. This is a significant burden, yet the existence of childhood dementia is not nearly as recognised as Alzheimer's disease. Unlike Alzheimer's disease, the genetic bases of the childhood dementias are very well defined, and reliably representative animal models exist. There is a large degree of overlap in the brain and behavioural changes between Alzheiemer's disease and the childhood dementias. Therefore, the possibility arises that the disease-associated mechanisms in the childhood dementias are similar to those in Alzheimer's disease. This study will assess molecular-level similarities between the pathologies of Alzheimer's disease and one of the more common forms of childhood dementia, Sanfilippo syndrome. Whether treatments targeting these shared pathologies are therapeutic in both conditions will be studied. Analysing parallel responses between Alzheiemer's disease and Sanfilippo models should reveal innovative solutions to both dementia types.

SCIENTIA PROFESSOR HENRY BRODATY POST-DOCTORAL FELLOWSHIP

Dr Kristie Stefanoska, Flinders University

Master sites of tau phosphorylation as treatment targets for Alzheimer's disease

Alzheimer's disease is the most common cause of dementia. Current medications provide symptomatic relief but do not alter the mechanisms underpinning it. Thus, treatments that prevent or limit Alzheimer's disease are still a major unmet clinical need. The progression of Alzheimer's disease correlates with the abnormal accumulation of a protein called tau. Abnormal accumulation of tau is due to the protein undergoing modification, which causes it to collect with other tau proteins and form larger, abnormal structures in the brain. Previously, the research team made the discovery that a few sites on tau – referred to as Master sites, can drive modification of tau. This raises the possibility that inhibiting disease-promoting Master sites could provide a novel approach to intervene and prevent modification of tau, and thus mitigate molecular processes underlying disease. This Fellowship will use animal models recapitulating Alzheimer's disease to address the role of tau Master sites. This will include interrogation of Master sites for their function in cognitive processes and may provide the molecular basis for designing new treatment strategies and/or biomarkers for the identification and prevention of tau-related disorders. This research has the potential to provide a new novel disease-limiting treatment, which would significantly benefit individuals living with tau-mediated dementia.

Mid-Career Research Fellowship Summaries

DEMENTIA AUSTRALIA RESEARCH FOUNDATION MID-CAREER RESEARCH FELLOWSHIP

Dr Liviu-Gabriel Bodea, The University of Queensland

Rejuvenating microglia to alleviate Alzheimer's disease

The risk of developing Alzheimer's disease increases with age. Although the general characteristics of the Alzheimer's disease brain are known, the development of effective treatments against the mechanisms leading to Alzheimer's disease are still lacking. This research will focus on investigating ways to improve the efficiency of the brain cell types known as microglia to clear Alzheimer's disease-specific pathological signs. Microglia have beneficial roles that decrease with age, when, in turn, become toxic for the surrounding cells. In this project, animal models that are experimentally induced to mimic Alzheimer's disease will be used to identify how microglia shift their roles due to age and Alzheimer's disease. For this, an extremely sensitive, novel technique will be used in mice. The findings will be then be validated using brain samples from people with and without Alzheimer's disease. In addition, a drug currently tested in other diseases and that can eliminate aged microglia will be repurposed, which will determine if the removal of aged cells improves the Alzheimer's disease pathology. Taken together, these results will contribute new knowledge about how Alzheimer's disease progresses and aid in the development of a potential novel treatment strategy against the disease.

Dr Janet van Eersel, Macquarie University

Pre-clinical development of next-generation tau aggregation-inhibitors for the treatment of dementia

Alzheimer's disease and Frontotemporal dementia are two common causes of dementia, for which there is no effective treatment or cure. In the brains of people with these disorders, abnormal clumping of a protein known as tau is observed. These tau clumps start off small, but over time mature, grow and form large tau tangles. Historically, it was thought that tau tangles cause cells within the brain to die. However, new research suggests that it is the smaller, initial tau clumps which are responsible for this. This has major implications, as current drugs in clinical trials are known to target tau tangles and, by causing them to disassemble, these drugs may in fact cause the release of smaller toxic tau clumps that were safely trapped away. This project aims to develop the next-generation of tau-targeting drugs, which act specifically on the smaller, toxic tau clumps but NOT on tau tangles. This may lead to greater clinical benefits. Several newly-developed, cutting-edge technologies that can detect tau clumps with better sensitivity will be used. Promising candidates will then be tested in various models to determine their potential. This will lay the groundwork for, hopefully, future clinical trial testing in patients.

DEMENTIA CENTRE FOR RESEARCH COLLABORATION MID-CAREER RESEARCH FELLOWSHIP

Dr Moyra Mortby, University of New South Wales

Understanding Neuropsychiatric Symptoms to inform timely diagnosis, patient management and lived experience of dementia

Changes in behaviours such as aggression, apathy and depression are common in dementia and contribute to more problems with doing everyday activities, more rapid memory loss, and more reliance on carers/family. They are often reported as a reason for entry into aged care. New research has shown that later-life behavioural changes before the onset of memory problems, known as Mild Behavioural Impairment (MBI), are an early warning sign for dementia. Research is now needed that will help us understand why some people are more vulnerable to MBI while others are resilient, how early detection of this dementia-risk marker can be used to help health care professionals and families manage the clinical presentation of MBI, how care service provision can be supported, and relationships safeguarded. A better understanding will help inform clinical diagnostics and care provision strategies. This research program provides the world-first opportunity to answer these important questions and will draw upon 20 years of data from the PATH Through Life Project and by leading the first Australian Survey of Knowledge and Understanding of MBI (ASKU-MBI). This understanding is urgently needed to improve early diagnosis and treatment of this dementia-risk marker in Australia.

Associate Professor Lyn Phillipson, University of Wollongong

Communities for dementia

Across Australia and worldwide, Dementia Friendly Communities (DFCs) have emerged as both a social movement and a policy response to enable community dwelling people living with dementia and their care partners to live well. However, whilst DFCs have been promoted as an effective approach to support wellbeing, there is a lack of available data to test this. This research will support the development of a national evaluation framework and the conduct of local case studies to establish the factors that produce positive outcomes for people living with dementia and their carers in Australia. It will also establish the resources needed to create and sustain DFCs. The multi-methods study will support: co-design of an Australian DFC Evaluation Framework and indices, as well as piloting and use of the framework to develop six in-depth case studies. Evidence will be synthesised across cases to assess impact of the different models, and what sustains their outcomes. Results will support understanding of what works and what doesn't work, with respect to designing, implementing and rolling out further DFCs in different community locations.