2023

Year in Review

Alzheimer's Research Australia

Alzheimer's Research Australia is a leading medical research institute specialising in Alzheimer's disease and related dementias.

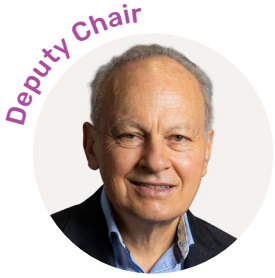
CONTENTS

ACKNOWLEDGEMENT OF COUNTRY

In the spirit of reconciliation, Alzheimer's Research Australia acknowledges the Traditional Custodians of the country throughout Australia and their connections to land, sea and community. We pay our respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.

BOARD OF DIRECTORS

Graeme Prior[1]



Dr Terry Bayliss[2]

Rodney O'Dea[3]

Prof Ralph Martins AO[4]

Prof Colin Masters AO[5]

Enzo Sirna AM[6]

Tim Andrew[7]

Rob Davies[8]

Dr Pamela Cresswell[9]
(Commenced June 2023)

Rebecca Hanrahan[10]
(Commenced June 2023)

Yvonne Parnell[11]
(Commenced June 2023)

1 Chief Executive Officer – Hall & Prior Aged Care Group
2 Coordinator Development Projects & Research Ramsay Health Care
3 Director – Ellann Finance
4 Research Professor of Neurobiology – Macquarie University. Foundation Chair of Aging and Alzheimer's disease – Edith Cowan University
5 Laureate Professor of Dementia Research – The Florey Institute and The University of Melbourne
6 Deputy Chief Executive Officer – National Trust of Western Australia
7 Head of UBS Perth
8 Accountant – Mine Site Construction Services
9 Adjunct Professor in Nursing – Curtin University
10 Special Counsel – Clayton Utz
11 Co-Director – Aqumen

CHAIR REPORT

It is with great pleasure that I present the 2023 Annual Report for Alzheimer's Research Australia (ARA). Through careful planning and allocation of resources, we have maximized our impact in the field of Alzheimer's research.

In line with our commitment to growth and progress, the Board has welcomed new members, bringing fresh perspectives and expertise to our organisation. Additionally, the Board has formed a strategic plan to transform ARA into a Medical Research Institute (MRI). This vision reflects our dedication to accelerating advancements in Alzheimer's research.

We have been actively working towards fostering collaborative partnerships, enabling us to share resources and expertise, and collectively contribute to the research and treatment sectors.

I would like to express my sincere gratitude to the staff, Board members, researchers, and former CEO Liza Dunne, whose dedication and hard work have been instrumental in the success of ARA in 2023. I also extend heartfelt thanks to our supporters and donors, whose generosity drives our mission forward.

With your continued support, we are confident that we will make significant strides in research, expand our treatment capabilities, and positively impact the lives of individuals affected by neurodegenerative diseases such as Alzheimer's.

Graeme Prior
Chair

189

Collaborators

In 2023 we were proud to collaborate with over 180 different, universities, colleges and institutions.

20

Countries

Our researchers worked with collaborators in 20 countries around the world in 2023.

26

Publications

Ralph Martins' and his team had 26 publications in 2023 adding to the global body of knowledge on Alzheimer's disease.

500+

Brain Scans

We performed 500+ brain imaging scans, crucial for Alzheimer's research.

CHIEF EXECUTIVE OFFICER REPORT

As the recently appointed CEO I am delighted to present this Annual Report. As I look back on the past twelve months, I feel a sense of pride and satisfaction to have joined an organisation where there are such remarkable achievements and advancements, in research, clinical trials, and strategic collaborations, all of which were supported by the assiduous efforts of our administrative team.

Furthermore, I would like to express my heartfelt appreciation to our generous donors, whose philanthropic contributions have played a pivotal role in driving our mission forward. Your ongoing support has provided us with the resources and means to push boundaries, make significant advancements in our research, and ultimately, positively impact the lives of individuals and communities touched by Alzheimer's and other dementias.

In line with our commitment to growth and engagement, we embarked on a transformative journey of rebranding and digital revitalisation. The launch of our new brand identity and the introduction of an interactive and user-friendly website signify our dedication to enhancing stakeholder engagement and fostering meaningful connections with participants, stakeholders, and donors alike.

Despite the challenges posed by the prevailing economic climate, I am pleased to report that we are in a solid financial position. Prudent management and planning have enabled us to navigate through these difficult times, ensuring the continuity of our operations and the pursuit of our mission. I would be remiss if I did not take a moment to bid a fond farewell to my predecessor, Liza Dunne, we are deeply grateful for her contributions and wish her all the best in her future endeavours.

As we look to the future, I am excited about the opportunities that lie ahead for Alzheimer's Research Australia. With a renewed focus on collaboration, innovation, and inclusivity, we are poised to enter a new era of growth and impact. Our forthcoming strategic planning initiatives will centre on expanding our reach, strengthening partnerships, and leveraging emerging opportunities to drive positive change and transformation.

We aim to embrace a 'One Team' approach, recognising that our collective efforts, including those of our Research Teams, Clinical Trials personnel, Board of Directors, and administrative support staff, are essential in achieving our shared goals and aspirations.

Thank you for your trust, support, and commitment to ARA's mission. Together, we are poised to create a brighter and more promising future for generations to come by 'Making Alzheimer's a Distant Memory.'

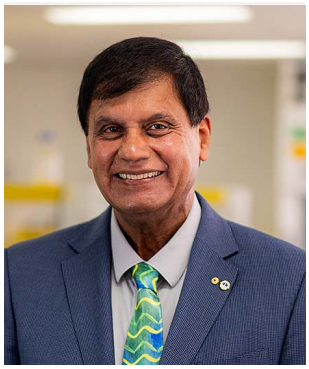
Professor Vicky Vass
Chief Executive Officer

ONE TEAM
ONE GOAL

OUR TEAM

Captured here are just a few of the remarkable individuals who contribute to our team's collective efforts, each playing a crucial part in bringing us one step closer to our mission.

Our Executive Research Team



Prof Ralph Martins
Director of Research

Prof Hamid Sohrabi
Research Leader

A/Prof Stephanie Rainey-Smith
Research Leader

Kevin Taddei
Deputy Director of Research

Adj Prof Roger Clarnette
Medical Director

Prof Vicky Vass
Chief Executive Officer

Dr Erin Bell
Clinical Trial Coordinator

Kimberly De Man
Clinical Trial Coordinator

Lilian Choo
Rater

Adriana Vivas Morillo
Research Assistant

Hannah Dwyer
Clinical Neuropsychologist (Registrar)

Jo Shaw
Clinical Trial Coordinator

Mark Rodrigues
Study Coordinator

Sam Rocchi
Senior Research Assistant

Vy Nguyen
Research Assistant

Kirsty Wood
Exercise Physiologist

A/Prof Mike Weinborn
Clinical Neuropsychologist

Dr Samantha Gardener
Research Fellow

Michelle Tegg
Research Assistant

Paula Mather
Clinical Trial Unit Manager

Isabella Sabbagh
Clinical Trial Coordinator

Jenny McKay
Clinical Trial Coordinator

Caren Wilson
Admin & Community Engagement Manager

Peng Loke
Senior Accountant

TOGETHER, WE CAN CHANGE THE FUTURE

BOARD

The Board of Alzheimer's Research Australia plays a crucial role, leveraging their diverse knowledge, extensive experiences, and vast networks to propel Alzheimer's research forward. They oversee our strategic progress, ensuring effective navigation towards our shared goal of combating this disease.

EMPLOYEES

Our dedicated research team is committed to pushing the boundaries of scientific exploration. They focus on cutting-edge research in our world-class facilities and are actively involved in national and international initiatives. They are supported by a small, cohesive team that is responsible for fundraising, facilities management, public education events, and communicating research to our supporters.

STUDENTS

Our aspiring student researchers are the driving force behind our scientific advancements. They are deeply engaged in pioneering research, both locally and globally, and contributing to our journey of discovery. Under the supervision of our senior researchers, students are the leaders of tomorrow, shaping the future of science with their passion and dedication.

VOLUNTEERS

Our incredible volunteers are the heart and soul of our research community. They generously dedicate their time and energy to ensure the progress of scientific discovery by assisting in the collection of study data, participating in long-running studies, and taking part in drug development trials. And they are our fundraising heroes!

COLLABORATIONS

The quest for knowledge knows no bounds it brings great minds from all over the world together! True innovation thrives on collaboration, bringing together leaders, researchers and experts to spark new ideas and discoveries. Our team has forged connections throughout Australia and the world, fostering a global network to advance Alzheimer's research.

COLLABORATORS

Murdoch University

Australia ECU Edith Cowan University

Macquarie University Sydney · Australia

TREASURER REPORT

It is with great pleasure that I present to you the financial overview of Alzheimer's Research Australia (ARA) for the 2023 year.

As the Treasurer of ARA, it is my privilege to offer you a transparent and comprehensive account of our financial management. This summary not only underscores our commitment to financial responsibility but also demonstrates how our financial management aligns with our mission of supporting Alzheimer's research.

The following page shows a breakdown of our financial performance, detailing our income, expenditures, and the allocation of funds to various research programs and initiatives. Our unwavering commitment to financial transparency ensures that every dollar is utilised effectively to further our mission. Despite the financial challenges faced by organisations in today's landscape, ARA has maintained a robust financial position through meticulous budgeting and effective financial management. We take immense pride in our ability to maximise the impact of every dollar spent, and this report is a testament to our dedication to financial practicality.

Our commitment to fighting Alzheimer's disease, matched only by community generosity, relies on individual and organisational contributions to fund our research. As we enter the next financial year, we remain steadfast in upholding

the highest standards of financial accountability while pursuing our goal of supporting Alzheimer's research. Your continued support is pivotal for our success in the fight against Alzheimer's disease

If you would like a full copy of our financials, please email info@alzheimersresearch.org.au or call (08) 6457 0253.

Rodney O'Dea

Rodney O'Dea
Treasurer

OUR FINANCIALS

DONATION INCOME

$892k

$892,615
17%

BEQUEST INCOME

$282k

$282,646
5%

CLINICAL TRIALS INCOME

$1.45m

$1,453,203
27%

OTHER RESEARCH & GRANT INCOME

$1.57m

$1,575,902
29%

INVESTMENT INCOME

$1.2m

$1,209,016
22%

DIRECT RESEARCH COSTS

$4.7m

$4,704,034
83%

INDIRECT RESEARCH COSTS

$982k

$982,008
17%

Income

Through the generosity of our donors and supporters, Alzheimer's Research Australia (ARA) is a leading medical research institute specialising in Alzheimer's disease and related dementias.

Income is derived from various sources, including returns from investments, revenue received from facilities owned or leased by ARA, the sale of shares, and other investment returns. ARA also earns income from conducting clinical trials for potential new pharmaceutical treatments for Alzheimer's disease. Income from research includes funds received in prior years but recognised as income in 2023, as the funds were tied to projects conducted in 2023.

Expenses

Direct Research Costs include researcher salaries, PhD scholarships, research facilities, research consumables, maintenance and depreciation of research equipment, research consultants, service providers (for example, brain imaging services) and costs associated with conducting clinical trials.

Indirect Costs facilitate the operation of research activities, and include information technology, finance, communications, fundraising, human resource management, research governance, risk management, insurance and strategic projects.

YOUR SUPPORT MAKES ALL THE DIFFERENCE

We are incredibly grateful that so many people share our vision.

In 2023 fundraisers continued to participate in a diverse range of 59 external events, including fun runs, marathons, and swimming races, leveraging online platforms like Grassrootz and Just Giving to raise crucial funds. We extend our heartfelt gratitude to our supporters, accompanying them every step of their fundraising journey with advice, encouragement, and our purple tee-shirts, symbolising their commitment to Alzheimer's research.

The trend of workplace giving has seen a significant surge, with a remarkable 49% increase in funds raised through this pre-tax system. We encourage every company to consider adopting workplace giving, a simple yet impactful way for individuals to contribute to Alzheimer's research. This approach becomes even more potent when paired with corporate matching, amplifying the impact of donations and fostering a culture of giving within the workplace. Our partnership with loyal corporate donors and their staff through the workplace giving program continues to be invaluable.

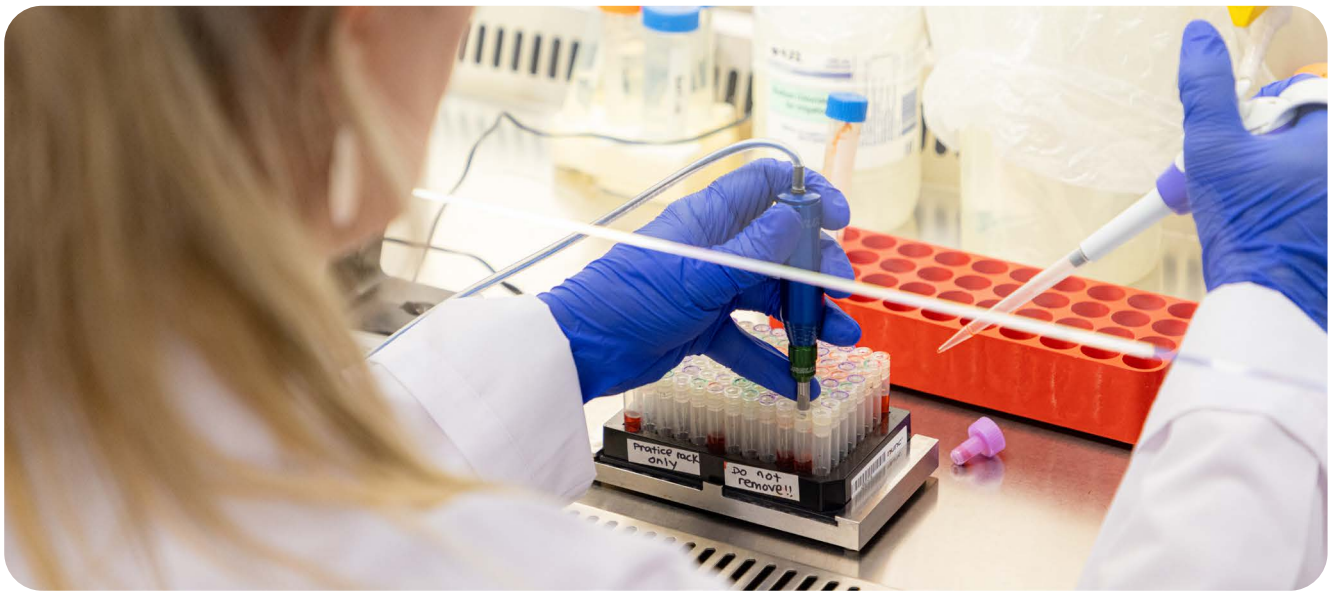
Grassrootz remains the primary online platform utilised by our generous donors, facilitating fundraising efforts across a spectrum of events nationwide. From marathons to fun runs and swimming races, participants raise vital funds to support Alzheimer's research through various organised activities.

Moreover, platforms like Just Giving and My Cause offer convenient avenues for individuals with innovative fundraising ideas to mobilize support for research initiatives. Whether it's hosting a morning tea or undertaking a daring haircut, the community's generosity knows no bounds when it comes to supporting Alzheimer's research.

Special occasions, such as weddings, anniversaries, and birthdays, provide meaningful opportunities for individuals to support Alzheimer's research by requesting donations in lieu of gifts. This kind gesture not only celebrates the occasion but also contributes to our collective vision of a world free from Alzheimer's disease.

We extend a special nod to our legacy leaders, as an increasing number of our donors choose to leave a gift in their Will. Their foresight and generosity leave an indelible mark on our efforts to eradicate Alzheimer's disease.

Every contribution, regardless of size, brings us closer to our mission. Whether it's a modest $2 donation or a substantial $200,000 contribution, every dollar received by Alzheimer's Research Australia brings us one step closer to making Alzheimer's a distant memory for future generations.



REGULAR GIFTS MAKE OUR DAY!

We extend our sincere gratitude to Alt Surfaces for their consistent and generous support through regular donations, which we deeply appreciate.

As a distinguished specialist flooring company located in Melbourne, Alt Surfaces has been a steadfast corporate sponsor of our organisation for several years.

Richard Di Bartolo, representing Alt Surfaces in Victoria, expressed the company's pride in supporting a cause that holds personal significance to them as a family-run business.

Corporate contributions, such as those from Alt Surfaces, play a crucial role in driving our mission forward. Their ongoing support makes a significant impact, for which we are truly thankful.

2,440

Donors

Every supporter shares in our success and achievements.

$1.17m

Raised

Our pioneering research is only possible due to our generous supporters.

59

Events

Fundraisers who run, swim, walk and ride for Alzheimer's research joined 59 different events in 2023.

$282K

Bequests

We work carefully with families to ensure that the donor's wishes are respected and the gift has a lasting impact.

39%

Regular Giving

Our regular givers increased by 39% in 2023.

RESEARCH STARTS WITH YOU

HBF Run for a Reason

HBF Run for a Reason is Perth's biggest annual fitness fundraising challenge and has been bringing over 30,000 people together annually since 2010. In 2023, we were thrilled to be number#18 on the charity leader board. More than 55 people chose to support Alzheimer's research.

Diane's Ride

Diane Humphreys, 66, rode 5471km across Australia in the Indian Pacific Wheel Ride, raising funds for us along the way. Motivated by her family's struggle with Alzheimer's, Diane raised an astonishing $10,272!

PEACH Alcoa

In 2023, we were grateful to receive generous support exceeding $10,000 from PEACH Alcoa towards our research efforts. With their funding, we acquired a key additional element to the BMG VANTAstar platform, which was kindly purchased by the Lions Alzheimer's Foundation. The additional element significantly enhances our research teams capabilities in drug discovery and assay development. This advanced platform technology accelerates our ability to identify potential therapeutic targets and fosters collaboration with other research groups.

Stadium Masters Swimming Club

Stadium Masters held their annual fundraiser Swim for Memory for ARA and raised more than $5,800. Club members range from 30 to over 80 and enjoy the fitness, friendship and fun of swimming together.

Wattle Rugby League Football Club

A team effort! Thanks to all the local Toowoomba sponsors who generously donated to various auctions and contributed to the success of the Wattles RLFC's tribute to their Life Member, Marg Hentschel, who is currently living with Alzheimer's disease.

THANK YOU

Our community consist of incredibly generous individuals who are united in their mission to make Alzheimer's a distant memory for future generations.

Peter Bedford

Riding in memory of his beloved father, Peter has been taking on the toughest tracks in Australia. With his motorbike and support vehicles emblazoned in our corporate colours, Peter is a staunch supporter of Alzheimer's research.

Rockingham Beach Cup

Since 2016, the Rockingham Beach Cup has been supporting Alzheimer's research, raising over $30,000 in that time. Thanks to the ongoing efforts of the Rotary Club of Palm Beach WA Inc., the City of Rockingham, and the Rockingham Beach Cup committee. Every year, attendees enjoy festivities and learn about our latest research.

Golden Eagle

Congratulations to jockey Tyler Schiller, who rode trainer Edward Cummings' powerful horse Strait Acer in the James Squire Golden Eagle. Racing NSW chose us as a nominated charity, and the fourth-place result meant an incredible $50,000 was donated to Alzheimer's research.

David Abud

Every year, David leads a team of cyclists over a 300km route through the picturesque countryside from Ballarat to Horsham, Victoria, and has raised $31,705 for Alzheimer's research.

Mott MacDonald Brisbane

Throughout the 2023 year, Mott MacDonald's Brisbane team members and their families organised various fun events, such as a bake sale, quiz night and silent auction. They also ran in the Brisbane Marathon, with many people running further than they had ever run before! Together, they raised over $5,000.

Reminisce

Reminisce creates hugely popular interactive music festivals where fans vote for the songs they want to hear. A portion of every ticket sale is donated to us. Thanks go to cofounder Corey Topp, who encourages festival attendees to contribute towards Alzheimer's research.

TOGETHER, WE CAN
CHANGE THE FUTURE.

RESEARCH REPORT

As the Director of Research for Alzheimer's Research Australia, I am pleased to report on the significant progress our team has made in 2023, thanks to the outstanding efforts of everyone involved and our collaborative partnerships both nationally and internationally.

Our clinical prevention research has continued to thrive, with particular emphasis on the AU-ARROW project, investigating lifestyle modifications to reduce Alzheimer's risk. Through targeted media campaigns, we successfully enrolled to date, 194 participants across NSW and WA with 141 of these randomised to one of the two study intervention arms, with ongoing funding support from the MRFF, US Alzheimer's Association, and Alzheimer's WA. Notably, we've made strides in presenting our findings at key events and conferences, furthering the dissemination of our research.

Our ongoing study led by Dr Binosha Fernando has delved deeper into the link between gut microbiota and Alzheimer's disease. Building on previous findings, our research aims to identify key bacteria influencing Alzheimer's pathology, holding promise for uncovering vital biomarkers, related to lifestyle, thus enhancing our understanding of disease progression.

Moreover, discussions have commenced for a DCAA treatment trial, aiming to enhance our understanding and diagnosis of cerebral amyloid angiopathy (CAA). Through collaboration with Leiden University in The Netherlands, our efforts bridge research between the Netherlands and Australia, benefiting both Alzheimer's and stroke patients.

Our partnership with the Australian Dementia Network (ADNeT) continues to yield significant advancements. In 2023 alone, we conducted baseline testing for 63 participants, initiated follow-up testing for 14 ADNeT participants, and engaged 5 participants for the EVOKE trial. With recent funding reinstatement, we are expanding services for clinician-referred participants.

Our involvement in the Early Diagnosis of Neurodegenerative Diseases (EDoN) initiative has highlighted the importance of digital biomarkers for early detection. EDoN's cross-sector approach has facilitated capacity building and skills development in early detection research, benefiting initiatives like the UK government's Dementia Mission. Ongoing data collection and analysis from four cohorts worldwide using digital tools continue, with anticipated insights to be shared in 2025, contributing significantly to our understanding of early detection measures.

In 2023, early results from our Retinal Imaging Study revealed promising findings with scans conducted on 43 individuals, demonstrating the effectiveness of machine learning programs in identifying retinal features for analysis. This innovative hyperspectral retinal imaging technique offers a non-invasive and cost-effective approach to diagnosing Alzheimer's disease by correlating retinal features with brain amyloid loads. These early results pave the way for new avenues in Alzheimer's diagnosis and treatment.

Many thanks to our amazing study participants, their families as well as the generous donors, without whom our research would not be possible. Thank you also to Alzheimer's Research Australia for providing world-class research facilities and support for many of these studies. I also want to express appreciation to our collaborators and supporters whose generosity provides essential funding for our work. Together, we are making significant strides towards a future free from Alzheimer's and dementia. It is a privilege to work alongside such an exceptional team, and I want to recognise Kevin Taddei, my deputy, for his pivotal role in securing ongoing support. A sincere appreciation to Adj Prof Roger Clarnette for supervising our clinical projects, and to A/Prof Rainey Smith and Prof Sohrabi for their leadership in key studies. A big thank you to Dr Fernando, Dr Bhardawaj, Dr Hone, Dr Gardener and Dr Pedrini's efforts in mentoring future leaders are also deeply appreciated. Lastly, I want to extend gratitude to the supporters of ARA whose generous philanthropy enables vital funding for researchers, clinical trials, world-class facilities and other essential research activities.

Professor Ralph Martins, AO
Director of Research

UNDERSTANDING

TRACK D-CAA

Prof Ralph Martins, Macquarie University and Edith Cowan University
Prof Hamid Sohrabi, Murdoch University
Mr Kevin Taddei, Edith Cowan University
Dr Samantha Gardener, Edith Cowan University

The TRACK D-CAA study started in mid-2022 with the goal to enrol 50 people from families with a known genetic mutation linked to Dutch-type Hereditary Cerebral Amyloid Angiopathy.

While most cases of CAA happen randomly in older adults, there's a rare inherited type that starts in mid-adulthood and typically leads to death in the patient's 60s.

Our team is actively recruiting participants for the study and advancing the TRACK-DCAA research, aiming to gather valuable data that can guide the development of future therapy trials for D-CAA.

2023 HIGHLIGHTS

In 2023, a local D-CAA Patient Advocacy group emerged, providing crucial support and knowledge-sharing for D-CAA families. This dedicated support system aids family members in navigating the challenges posed by this condition, offering invaluable assistance.

Moreover, exciting progress was made with ongoing discussions regarding a Perth site for the inaugural drug trial for CAA. This development marks a significant step forward, aiming to include both Hereditary D-CAA and sporadic CAA arms in the study. Individuals and physicians interested in participating are encouraged to reach out to Dr. Samantha Gardener at (08) 6457 0419.

Additionally, noteworthy achievements were attained by PhD students Seyed Mehrdad Savar and Vandhana Easwaran, recipients of scholarships supported by this study. Both students successfully received confirmation of their candidature at Murdoch University, further advancing research in this field.

Student Profile

MEHRDAD SAVAR

SUPERVISORS

Prof Hamid Sohrabi, Murdoch University
Prof Ralph Martins, Edith Cowan University
Dr Bin Ma, Murdoch University
Dr Farzana Jahan, Murdoch University
Dr Eugene Hone, Edith Cowan University

My research project aims to identify biomarkers in cerebrospinal fluid (CSF) and blood that may indicate early and preclinical stages of cerebral amyloid angiopathy (CAA) in individuals from Dutch-CAA families. The TRACK Dutch CAA Study, spanning two years, is dedicated to investigating changes in specific proteins in both blood and CSF and the potential role of novel fluid biomarkers in CAA detection. The outcomes of this project have the potential to establish reliable measures for future interventional studies. I have been awarded a university tuition fee scholarship from Murdoch University as well as living allowance stipend through ARA. I have recently published my first paper in the journal Frontiers in Neuroscience.

DIAN

Prof Hamid Sohrabi, Murdoch University
Mr Kevin Taddei, Edith Cowan University
Dr Samantha Gardener, Edith Cowan University

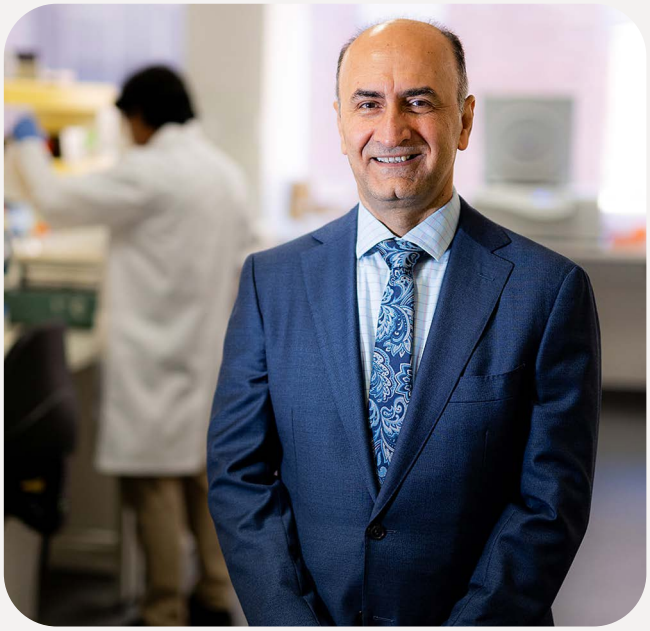
The global registry allows families and researchers to connect and will help to discover how Alzheimer's disease progresses and find ways to treat and prevent the disease.

The Dominantly Inherited Alzheimer Network (DIAN) Observational Study, led by Washington University since 2008, is a worldwide project. The goal is to find out how Alzheimer's disease develops by studying biological changes in those who carry a gene mutation that will cause Alzheimer's disease.

This study collects samples and data from adults who have a parent with a known inheritable, genetic mutation for Alzheimer's disease causing a young-onset, familial type of the disease. There are 23 sites worldwide, with two Australian sites: one in Perth using Alzheimer's Research Australia facilities, and one in Sydney.

People with a strong family history of early-onset Alzheimer's (e.g., clinical symptoms before 60 years of age) who are interested in the DIAN study and DIAN clinical drug trials are invited to contact Dr Samantha Gardener on 08 6457 0419. Individuals or physicians with such patients are welcome to enquire.

More than 100 influential publications worldwide have tapped into DIAN data, showing how we are spreading knowledge globally and making a difference in understanding Alzheimer's.



Professor Hamid Sohrabi

100 publications used DIAN data worldwide

What's involved in a DIAN visit?

- Blood Sampling
- Lumbar Puncture
- Clinical Assessment
- Neuro-psychological Testing
- Magnetic Resonance Imaging (MRI)
- Tau and Nav Positron Emission Tomography (PET)

UNDERSTANDING

EDoN

A/Prof Stephanie Rainey-Smith, Murdoch University
Prof Ralph Martins, Macquarie University and Edith Cowan University
Mr Kevin Taddei, Edith Cowan University
Prof Hamid Sohrabi, Murdoch University
Study Coordinator: Ms Jo Shaw

A/Prof Stephanie Rainey-Smith

Our contribution to the Early Detection of Neurodegenerative Diseases (EDoN) initiative kicked off in 2022 with a mission: to explore creative methods for spotting dementia-related illnesses in their early stages.

So far, research has shown that digital biomarkers could be key to spotting disease early. EDoN continues to gather data from four cohorts worldwide, including from the WA Memory Study which is supported by ARA. The focus is now on tracking participants, organising data, and sharing it with researchers globally to learn more about which measures help the early detection of dementia and Alzheimer's.

AIBL

Prof Ralph Martins, Macquarie University and Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University
Mr Kevin Taddei, Edith Cowan University
Prof Hamid Sohrabi, Murdoch University
Dr Samantha Gardener, Edith Cowan University
Dr Binosha Fernando, Edith Cowan University
Dr Steve Pedrini, Edith Cowan University

A/Prof Stephanie Rainey-Smith, and Mr Kevin Taddei

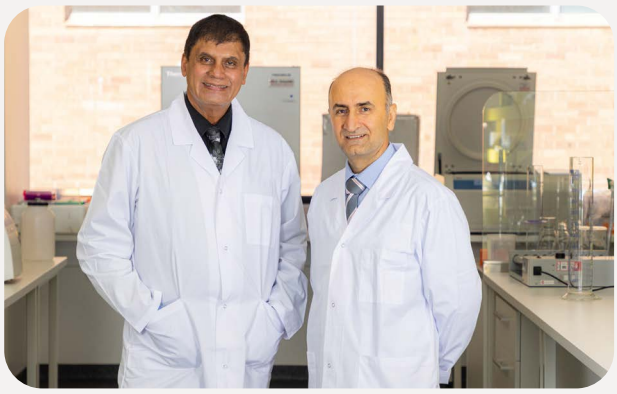
The Australian Imaging, Biomarkers, and Lifestyle Study (AIBL) stands as a global leader in Alzheimer's disease research. For more than 18 years, AIBL has brought together Alzheimer's researchers from across Australia, to create one of the largest studies of its kind.

The extensive database has contributed to understanding Alzheimer's disease development, tracking changes in the early stages, and designing treatments to delay, prevent, or treat the disease. ARA provides clinical and laboratory research facilities, imaging sponsorship, research governance and administration support.

Since 2006, AIBL has gathered data from 3045 participants, covering 10,494 person-contact years.

WAMS

Prof Hamid Sohrabi, Murdoch University
Prof Ralph Martins, Macquarie University and Edith Cowan University
A/Prof Michael Weinborn, University of Western Australia
Mr Kevin Taddei, Edith Cowan University
Dr Samantha Gardener, Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University



Professor Ralph Martins and Professor Hamid Sohrabi

The WA Memory Study (WAMS) is on a journey of discovery to explore what factors might shape changes in memory over time, and to follow along as our cognitive abilities evolve with age.

Since the study's inception in 1996, more than 1200 people have been tested at 18-month intervals for the purpose of better understanding memory changes across the ageing process. Participants undergo clinical and memory assessments, blood sample collection, cerebrospinal fluid collection and brain imaging. The study has contributed to over 60 peer-reviewed papers as well as the development of some novel measures including the WA Olfactory Memory Test and the WA Prospective Memory Test.

Gut & Nutrition

Dr Binosha Fernando, Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University
Dr Samantha Gardener, Edith Cowan University

Studying how the gut and brain are linked could help prevent Alzheimer's or reduce the risk of it developing.

The development of Alzheimer's disease is thought to be strongly influenced by nutrition. There is also evidence that the gut microbiota plays a key role in these processes. The gut-brain axis may be affected by dietary changes, thereby affecting the risk for Alzheimer's disease.

Some factors being examined by the team include the potential benefits of foods rich in polyphenols (such as the sorghum and goji berries), whether dietary patterns are an influencing factor, and the possible connection of gut microbial 'imbalance' to the progression of Alzheimer's.

Dr Binosha Fernando

UNDERSTANDING

Student Profile

ANJANA RAJENDRA

SUPERVISORS

Dr Catherine Bondonno, Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University
Prof Jonathan Hodgson Edith Cowan University
Dr Nicky Bondonno Edith Cowan University
Dr Samantha Gardener, Edith Cowan University

I am investigating association between dietary nitrate and cognition, cognitive decline, dementia and markers of brain health.

My most recent work has been focused on understanding the relationship of dietary nitrate and cognition. Using data from the Australian Imaging, Biomarkers and Lifestyle (AIBL) Study, I have demonstrated that habitual intake of dietary nitrate from natural sources impacts cognitive performance in an APOE genotype contingent manner. These results suggest that a 60mg/day higher intake of plant-derived nitrate could protect cognition, thereby reducing the risk of Alzheimer's disease.

LIFESTYLE & PREVENTION

AU-ARROW

Prof Ralph Martins, Macquarie University and Edith Cowan University
Prof Hamid Sohrabi, Murdoch University
Mr Kevin Taddei, Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University
Study Coordinator: Dr Samantha Gardener

The AU-ARROW study will discover more about how changing elements of your lifestyle may have a big impact on preventing symptoms.

The AU-ARROW study is investigating what lifestyle modifications might impact in a positive way on improving brain health and reducing the risk of developing Alzheimer's disease.

Recruitment of participants required for this two-year clinical trial commenced in February 2022. In 2023 we successfully enrolled 194 participants in the AU-ARROW Study.

Our goal is to enrol 600 participants, with 300 at each of the two study sites: one in Perth at Alzheimer's Research Australia and the other in Sydney at Macquarie University. Participants are randomised into one of two study arms – the Multidomain Lifestyle Intervention, or the Health Education and Coaching group.

Lifestyle modifications include aerobic exercise, resistance training and stretching, dietary changes, cognitive training sessions, medical monitoring and regular health education sessions.

Newspaper articles, and TV and radio advertisements significantly increased the visibility of Alzheimer's Research Australia and led to numerous potential participants contacting us, thereby enhancing our awareness and presence in the community.

The AU-ARROW protocol paper was submitted for publication in the respected medical journal "Alzheimer's & Dementia: Translational Research & Clinical Interventions".

Dr Samantha Gardener

In 2023 we successfully enrolled 194 participants in the AU-ARROW Study.

AU-ARROW presentations spanned 4 continents, showcasing global engagement and reach.

LIFESTYLE & PREVENTION

Sleep Improvement Study

A/Prof Stephanie Rainey-Smith, Murdoch University
Prof Ralph Martins, Macquarie University and Edith Cowan University
Study Coordinator: Ms Jo Shaw

Improving sleep might help delay or prevent Alzheimer's disease and other dementias.

The Sleep Improvement Study (SIS) team is investigating possible links between poor sleep, cognitive performance and brain health. The study is recruiting older Australians who have concerns about their memory and who feel that they are sleeping poorly.

Individuals have their sleep monitored at the Centre for Sleep Science at UWA. Once these initial assessments are complete, participants then undertake a psychology-based program to improve their sleep. The participants undergo tests to measure their memory and thinking abilities, as well as brain scans to assess markers of brain health. Participants also donate a blood sample which is used to examine biomarkers that are of interest to Alzheimer's disease.

SIS has received funding from the National Health and Medical Research Council (NHMRC), the US-based Alzheimer's Association, the Mason Foundation, the WA Department of Health and is also supported by ARA.

A/Prof Stephanie Rainey-Smith and Professor Ralph Martins

Highlight

In 2023, the CogSleep Symposium saw researchers from Murdoch University, Macquarie, Edith Cowan University, and the University of Sydney join ARA team leader A/Prof Stephanie Rainey-Smith for an expert panel on the importance of a restful night's sleep. The well-attended event provided thought-provoking discussion and provided new insights into the fascinating world of sleep research.

Louise Pivac, a PhD candidate under the supervision of A/Prof Rainey-Smith who is partially funded by ARA along with Murdoch was awarded the Murdoch University Conference Travel Award.

This opportunity enabled her to attend the Alzheimer's Association International Conference (AAIC) in Amsterdam, where she presented her research on Sleep!

ADNeT

Prof Ralph Martins, Macquarie University and Edith Cowan University
Prof Hamid Sohrabi, Murdoch University
Mr Kevin Taddei, Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University
Dr Samantha Gardener, Edith Cowan University
A/Prof Stephanie Rainey-Smith, Murdoch University
Prof Hamid Sohrabi, Murdoch University
Adj Prof Roger Clarnette, Curtin University

Since its inception, the Australian Dementia Network (ADNeT) has developed into a powerful national collaboration. Prof Ralph Martins is the chief investigator for ADNeT, which brings Australia's leading researchers, clinicians and consumers together.

The network of 17 institutions is supported by the National Health and Medical Research Council (NHMRC), The Wicking Trust, The Yulgilbar Foundation, and Dementia Australia. Its three core aims are to establish a Clinical Quality Registry of people diagnosed with dementia, provide screening of patients suitable for participation in clinical trials, and establish a collaborative network of Memory Clinics across Australia to conduct high-quality dementia assessments.

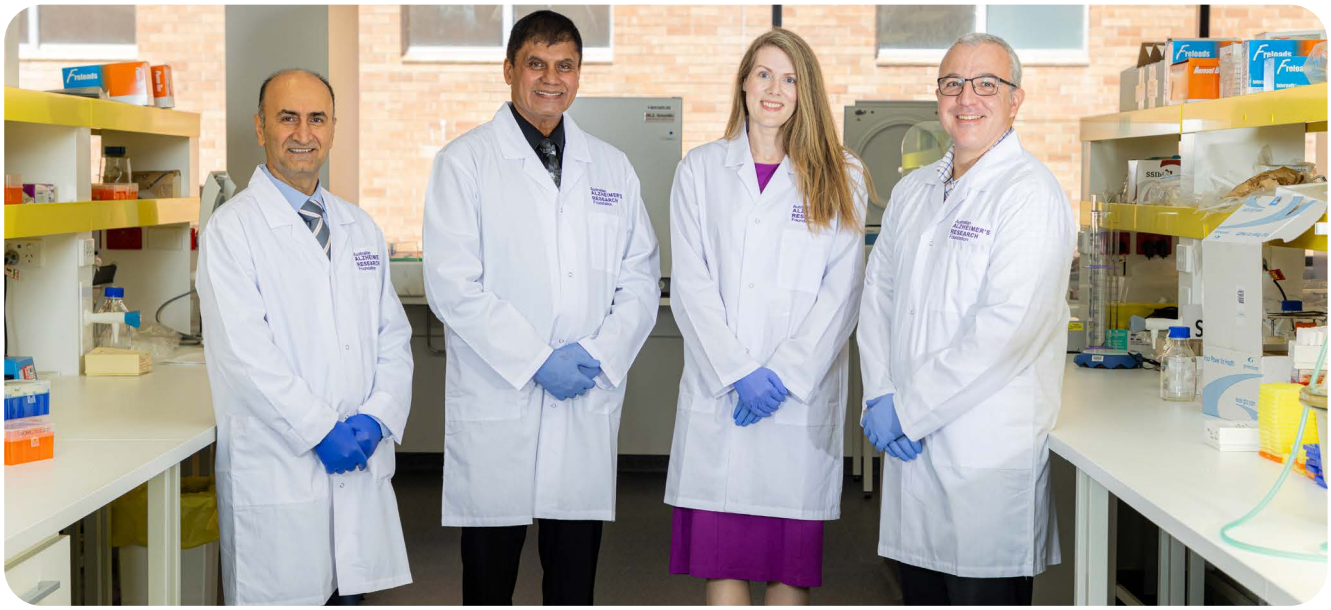
150
Memory Clinics across Australia

3,439
People registered into the ADNeT Volunteer Portal

1,158
Screenings completed for Trial Ready cohort

57
Clinical Quality Registry sites

3,247
Participants recruited to the Clinical Quality Registry



Left to right. Prof Hamid Sohrabi, Prof Ralph Martins, A/Prof Stephanie Rainey-Smith and Mr Kevin Taddei

ESSENTIAL DIAGNOSIS

Retinal Imaging

Prof Ralph Martins, Macquarie University and Edith Cowan University
Dr Eugene Hone, Edith Cowan University
Dr Shaun Eslick, Macquarie University
Dr Shaun Frost, CSIRO

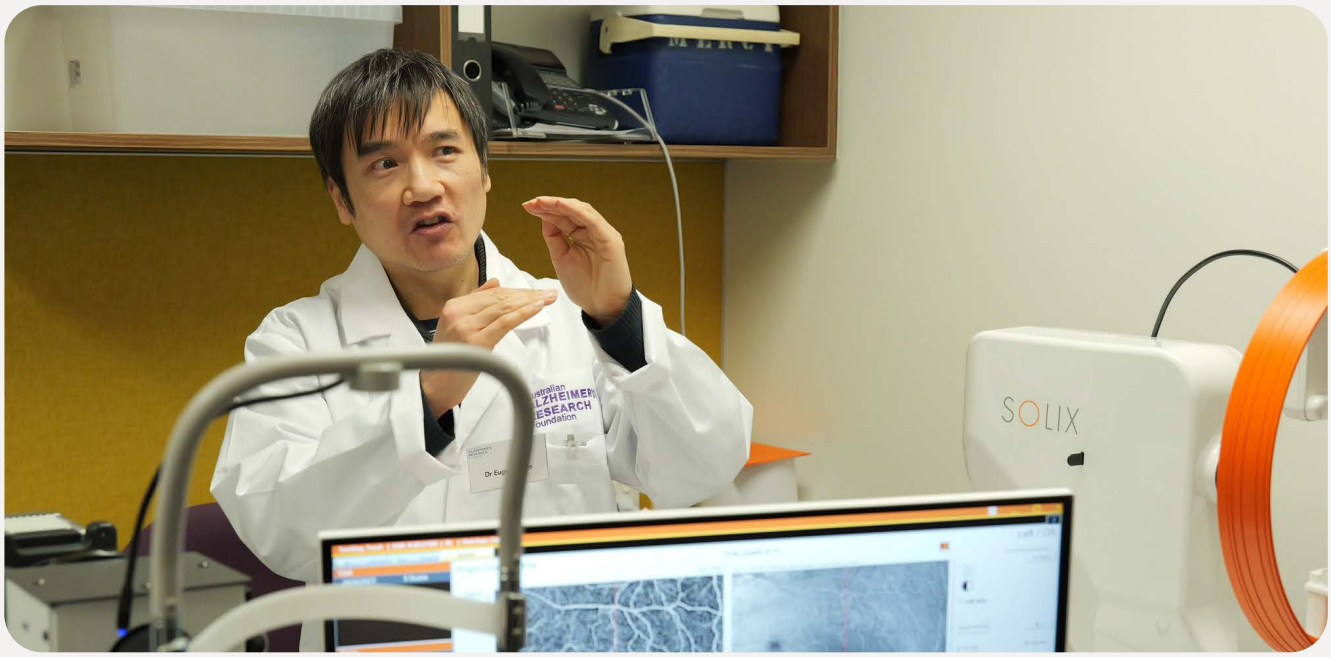
This project aims to develop a non-invasive eye scan to diagnose Alzheimer's disease.

The relationship between the retina, the main sensory tissue of the eye, and brain amyloid levels is being investigated.

The main instrument used is the hyperspectral retina camera, (provided by industry partner Optina Diagnostics) which takes images of the retina at a range of specific wavelengths.

Dr Eugene Hone is developing a process that may allow for a non-invasive and widely available scan that would not require an expensive facilities or equipment. He has shown that image segmentation algorithms for retinal image analysis can reliably and autonomously select retina regions for analysis.

Dr Eugene Hone



Childhood Dementia

Dr Prashant Bharadwaj, Edith Cowan University

Understanding more about this rare group of diseases could be critical when developing treatments or exploring avenues of understanding.

One in every 2,800 babies is born with a rare condition that causes childhood dementia, but due to its rarity, it often flies under the radar. Dr Prashant Bharadwaj is diving into the intricacies of childhood dementia, aiming to uncover crucial clues hidden within the proteins found in the blood and urine of affected children. These discoveries could serve as key indicators, offering insights into the progression of the disease over time. Dr Bharadwaj's work is funded by various sources including a FHRIF Research Excellence Award, with primary funding from Alzheimer's Research Australia.

Dr Prashant Bharadwaj

Student Profile

PURNA CHANDRA POUDEL

SUPERVISORS

Dr Eugene Hone, Edith Cowan University
Dr Shaun Frost, CSIRO
Dr Shaun Eslick, Macquarie University
Prof Ralph Martins, Macquarie University and Edith Cowan University

My research aims to identify retinal changes associated with brain amyloid load using hyperspectral retinal images and develop an Alzheimer's disease (AD) prediction model. This study collects retinal images from participants with different brain amyloid loads using a hyperspectral retinal camera. The retinal images are then analysed using machine learning algorithms to find spectral features specific to brain amyloid levels. The proposed detection model using retinal data has demonstrated promising results in brain amyloid prediction.

ESSENTIAL DIAGNOSIS

Blood Biomarkers

Prof Ralph Martins, Macquarie University and Edith Cowan University
Dr Pratishtha Chatterjee, Macquarie University

The Blood Biomarker project aims to develop a blood test that accurately reflects the amyloid buildup in the brain.

An early diagnosis is a key factor that will allow earlier medical intervention and preventative therapies with the goal of delaying the onset of the disease in affected individuals, thereby greatly improving their quality of life and reducing care-associated costs.

However, we need to know if a person is at risk of developing Alzheimer's well before the individual begins to have problems with their memory, thinking and behaviour. The window of opportunity is in the decades between the initial deposition of amyloid and the appearance of clinical symptoms.

Once a diagnosis is made, research has identified various lifestyle modifications that play a major role in altering the risk of developing Alzheimer's. And new disease-modifying drugs are becoming available that remove amyloid plaques almost completely within 18 months.

But the vital piece of the puzzle is the early diagnosis. Unfortunately, current detection methodologies are unsuited for community-wide screening for various reasons, so developing a simple, cost-effective blood test is vitally important.

Early detection allows for early intervention, which will be the most effective way to change the future of this disease.

Prof Ralph Martins and Dr Steve Pedrini

Together with Spheria and Resolution Capital, the PNI Foundation is proud to support the important blood biomarker research. For a small Foundation like ours, being able to contribute to this work and see its far-reaching impact is fantastic. The Foundation and its partners have a strong emphasis on collaboration and this partnership allows us to work together for a common goal.

Mary Jung, PNI Foundation.

When faced with significant challenges, true supporters step up. We are grateful to the PNI Foundation and its affiliated fund managers, Spheria Asset Management and Resolution Capital, for their steadfast and substantial support. Their generous contributions have been instrumental in driving forward critical Alzheimer's research initiatives, including the development of an early-stage blood biomarker test. The collaboration with ARA has matured over the years into a cherished partnership, reflecting a shared commitment to advancing research in the fight against Alzheimer's.

Led by Dr Steve Pedrini

The Blood Biomarker project was thrilled to be successful in a $100,000 BSNRF grant an application that will focus on developing additional diagnostic tools for the diagnosis of Alzheimer's disease. Moreover, we currently have two grant applications under review, demonstrating our persistent efforts to secure funding for vital research initiatives.

Dr Steve Pedrini

Dr Pedrini published four manuscripts in 2023.

PNI Foundation

SPHERIA ASSET MANAGEMENT

RESOLUTION CAPITAL

ESSENTIAL DIAGNOSIS

New Collaborations

Igniting partnerships across the global research community.

In collaboration with scientists at Banner Research Institute and Harvard Medical School (USA), we'll be evaluating the levels of blood biomarkers in the largest known cohort with Early Onset Familial Alzheimer's Disease (EOFAD). This group of about 5000 people live in the mountains of northern Colombia and carry a specific genetic mutation that causes memory-related cognitive decline, eventually leading to dementia. EOFAD is similar to sporadic Alzheimer's disease but starts at a younger age, around 47 years old. In our initial analysis, we'll assess the levels around 2000 plasma samples.

In collaboration with scientists at Leiden University Medical Center (Netherlands) and Harvard Medical School (USA) we will assess the levels of several biomarkers in the blood and cerebrospinal fluid of people with Cerebral Amyloid Angiopathy. This disease occurs due to a mutation in the Amyloid Precursor Protein, leading to the buildup of amyloid in the walls of blood vessels in the brain, causing bleeding, strokes and cognitive decline.

DEVELOPING TREATMENTS

Small Molecules

Dr Prashant Bharadwaj, Edith Cowan University

The primary aim of the project is to discover new small-molecule drugs and assess how effective a treatment is in protecting the nervous system, particularly the brain, from damage or degeneration.

This project looks into testing chemicals in models of Alzheimer's to find new small-molecule drugs. Its goal is to see how well these drugs can safeguard the nervous system, particularly the brain, from damage or decline.

Dr Prashant Bharadwaj has created a new way to improve cell function and help clear the Alzheimer's protein beta-amyloid. He has also found a new small molecule using this method, which works well for screening purposes.

Dr Prashant Bharadwaj

New small molecule leads for Alzheimer's disease identified.

NEW COLLABORATIONS

UNIVERSITY OF ALBERTA

THE UNIVERSITY OF ALABAMA

Student Profile

TAYELOR GALBRAITH

SUPERVISORS

Dr Prashant Bharadwaj, Edith Cowan University
Prof Ricardo Mancera, Curtin University

My project will investigate the changes to tau phosphorylation by examining phosphokinase activity in model cells, after the addition of receptor agonists and heterocomplexes. Investigating the role of amyloid beta 42 in tau phosphorylation through AMY agonism is important for the identification of new drug targets that improve Alzheimer's therapy outcomes. The identification of downstream targets could also allow the repurposing of existing drugs in Alzheimer's treatment. I achieved first class honours last year and was also selected by the Symposium of WA Neuroscience to be a guest speaker for their 2023 SWAN symposium.

DEVELOPING TREATMENTS

Testosterone Study

Prof Ralph Martins, Macquarie University and Edith Cowan University
Prof Hamid Sohrabi, Murdoch University
Mr Kevin Taddei, Edith Cowan University
Adj Prof Roger Clarnette, Curtin University

The Testosterone study is exploring whether testosterone could potentially reduce the risk of developing Alzheimer's disease by lowering amyloid protein levels in the brain.

Participants in the research undergo an initial brain scan to assess amyloid levels. Following this, they receive 13 months of treatment (or a placebo) along with memory testing. Finally, a follow-up brain scan determines whether testosterone treatment has successfully prevented amyloid protein buildup in the brain. Men aged 60 – 80 with lower-than-average testosterone levels are still required to complete the clinical study, which is conducted in Perth and Sydney.

Mr Kevin Taddei

Innovative Drug Trials

In 2023, amidst significant media attention on potential new treatments for Alzheimer's disease, Alzheimer's Research Australia continued to participate in groundbreaking drug trials.

Operating from the Hollywood Specialist Centre, our team of clinicians and clinical trial staff work with participant volunteers, conducting trials for major pharmaceutical companies. Led by Professor Roger Clarnette, a senior specialist physician at Fremantle Hospital, our team is dedicated to advancing the understanding and treatment of Alzheimer's disease.

While the current emphasis in Alzheimer's disease research is on removing amyloid from the brain, other approaches are also under investigation.

Our Clinical Trials Division is recruiting participants for studies involving treatments such as anti-inflammatory drugs, re-purposed diabetic agents for Alzheimer's disease, and anti-tau immunological therapy.

Adj Prof Roger Clarnette

"Our teams' expertise in clinical trials continues to attract sponsors and their studies to our site. Clinical trials provide the newest research in the Alzheimer's disease space to be translated in to therapeutic agents that are now showing great promise in effectively managing the condition."

– Adj Prof Roger Clarnette

2023 Highlights

In June 2023, the Australian Therapeutic Goods Administration (TGA) commenced evaluating an application to register the use of EISAI's drug, Lecanemab (LEQEMBI), following its approval in the US in early 2023. Our team continue to trial this drug in the AHEAD3-45 Study, which is investigating the use of Lecanemab in preclinical Alzheimer's disease: that is, people who have high-risk factors for Alzheimer's disease (including family history and a certain amount of abnormal amyloid in the brain) but are not showing symptoms. Recruitment for this study is open for people aged 55-80 years who have high-risk factors for Alzheimer's disease but are not diagnosed with Alzheimer's disease.

15

In 2023 the team took part in 15 studies.

4

In 2023 our team worked with 4 of the top pharmaceutical companies in the world.

50

Over the past decade, we are proud to have taken part in over 50 pharmaceutical-sponsored trials.

Together, let us make a difference and create a world where Alzheimer's is detected early, prevented effectively, and treated successfully.

KEY FACTS

ALZHEIMER'S & DEMENTIA

Alzheimer's disease is the most common form of dementia, affecting up to 70% of all people with dementia.

70%

488K

488,000 Australians are currently living with dementia.

56%

Deaths due to dementia have increased by 56% in the last 10 years.

Alzheimer's disease is the leading cause of death for Australian women.

9%

Dementia contributed to 9% of deaths in Australia in 2022.

Alzheimer's is the main cause of dementia.

2nd leading cause of death in Australia.

Without a major medical breakthrough, the number of people living with dementia is expected to double in the next 30 years.

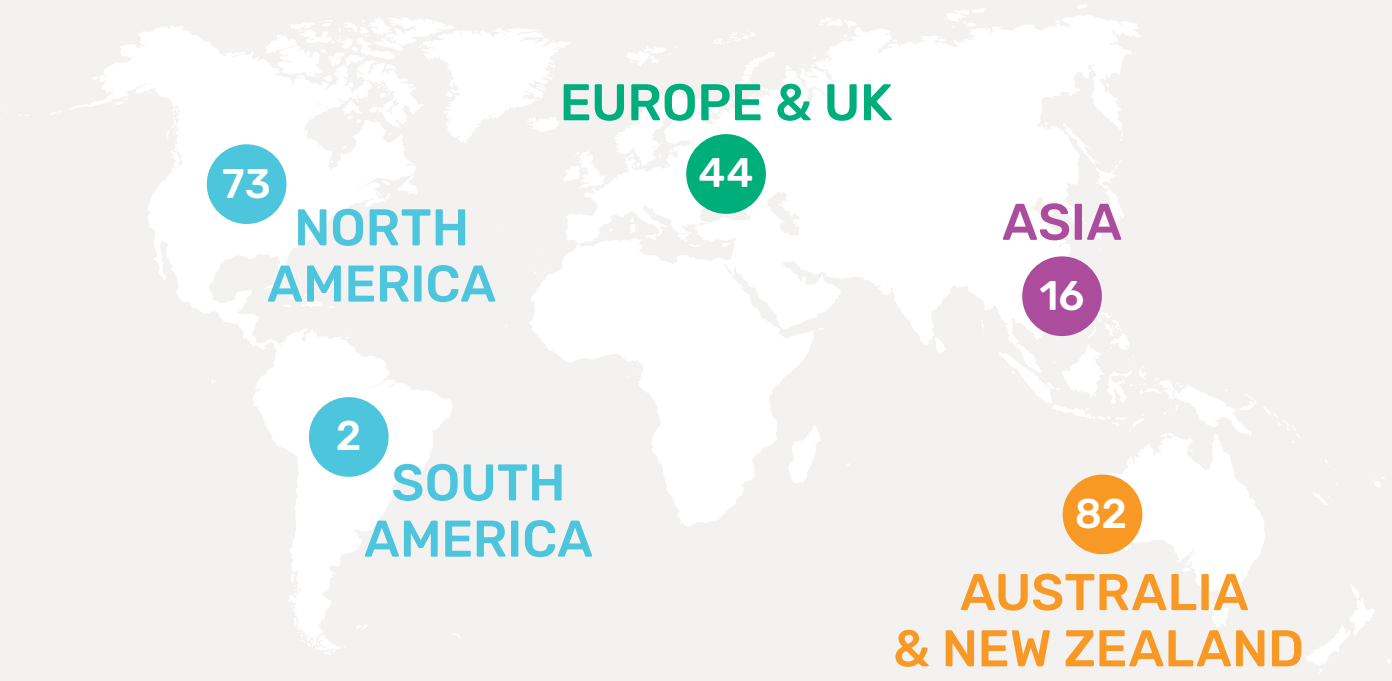
More than two-thirds of aged care residents have moderate to severe cognitive impairment.

THERE IS CURRENTLY NO CURE.

Australian Bureau of Statistics (2018) Causes of Death, Australia, 2017 (cat. No. 3303.0). The National Centre for Social and Economic Modelling NATSEM (2016) Economic Cost of Dementia in Australia 2016–2056. Dementia Australia (2018) Dementia Prevalence Data 2018-2058, commissioned research undertaken by NATSEM, University of Canberra.

UNITED HORIZONS

The pursuit of knowledge transcends borders and unites scientists from every corner of the globe. It is through true collaboration and engagement with other leaders, educators and experts that innovation can occur. Some of our collaborators are listed below.



EUROPE & UK

Global Brain Health Institute
Institute for Stroke and Dementia Research
Leiden University
UK Dementia Research Institute
University College London
University of Barcelona
University of Bordeaux
University of Exeter
University of Gothenburg
University of Manchester
University of Tübingen

NORTH & SOUTH AMERICA

Alzheimer's Association
Brown University
Columbia University
Emory University
Harvard Medical School
Icahn School of Medicine
Indiana University
McGill University
University of California
University of Pittsburgh
University of Southern California
University of Toronto
Washington University

AUSTRALIA & NEW ZEALAND

Austin Health
Curtin University
CSIRO
Edith Cowan University
Flinders University
KaRa Institute of Neurological Diseases
Kolling Institute of Medical Research
Macquarie University
Monash University
Murdoch University
National Ageing Research Institute
Neuroscience Research Australia
The Woolcock Institute of Medical Research
University New South Wales
University of Melbourne
University of Newcastle
University of Otago
University of Queensland
University of Sunshine Coast
University of Sydney
University of Western Australia

ASIA

Fudan University
Niigata University
Osaka City University
Osaka Metropolitan University
University of Kelaniya
University of Tokyo
University of Ulsan College of Medicine

TOGETHER, WE CAN CHANGE THE FUTURE.

HEAD OFFICE

8 Verdun Street, Nedlands WA 6009
PO Box 963, Nedlands WA 6909

T. (08) 6457 0253
F. (08) 6457 0270

info@alzheimersresearch.org.au

alzheimersresearch.org.au