Australian **LZHEIMER'S ESEARCH** Foundation

Year in Review 2016

THE FOUNDATION

You join the researchers and staff of the Foundation in fighting for memories. Because of your support we are able to continue with our vision, mission, objective and values. You are our inspiration.

Our Vision

A world in which Alzheimer's disease no longer exists.

Our Mission

To support research that makes Alzheimer's disease treatable and preventable.

Our Objective

The Australian Alzheimer's Research Foundation becomes a self-sustaining Foundation that raises funds to support Alzheimer's disease research.

Our Values

For our stakeholders and customers we will always focus on supporting Alzheimer's disease research; act with integrity; be transparent in everything we do; and celebrate our achievements.

Our key pillars are revenue generation through fundraising, grants and research fee-for service activity; research focused on understanding, preventing, diagnosing and treating Alzheimer's and other neurodegenerative diseases; and community services related to education and awareness. To ensure our continued operations and sustainability we will always have a clear and shared understanding of our risk appetite and have mechanisms in place to ensure we operate within this; ensure appropriate policies and procedures are in place and complied with; maintain strict financial discipline; and refuse to compromise on quality and competence in anything we do and represent.

OUR MUTUAL PURPOSE

We exist to fight for a world in which Alzheimer's disease no longer exists.

The Foundation began with the passion of a young researcher. Because of his dream and your support we continue to make inroads into the complicated journey towards a cure, treatment and diagnosis of Alzheimer's disease.

In the early 1990's, a young Professor Ralph Martins established a research laboratory. As the challenge grew, ongoing support allowed for the significant expansion of Alzheimer's research. The Foundation was established in 2001 and has developed considerably since that time. We continue to grow as does the need for a significant medical breakthrough.

In the sixteen years the Foundation has been focused on Alzheimer's disease research, the figures and predictions have changed dramatically. In early 2000's it was predicted we would reach 500,000 Australians with dementia by 2050. Alarmingly, we are almost at that figure in 2017, and are now predicting to soar to 1,100,890 by 2050. This makes the work we undertake in support of a world free of Alzheimer's disease ever more important. The generosity of you, our donors, supporters and ambassadors, sustains our quest to seek prevention and ultimately a cure for Alzheimer's disease, already impacting on a growing number of our friends and family.

Our quality research team continued to be led by Professor Ralph Martins. In 2016 the Foundation continued to provide core funding to the Cooperative Research Centre (CRC) for Mental Health and ECU. Our research fee-for-service arm through our Tommorrow trial and trials conducted in our clinical trials division under the supervision of Dr Roger Clarnette remained strong.

Our partners joined you in continuing to provide a valuable commitment. Our collaborations with Lions Clubs Australia, Hollywood Private Hospital, Edith Cowan University, Wesfarmers, and the CRC for Mental Health remained fundamental in our dedication to continued excellence in scientific endeavour.



I am privileged once again to report to you the challenges and opportunities the Foundation has experienced over the past year. We value you being part of the Foundation team. Along with the board, research team, staff, volunteers and the many collaborators who work tirelessly because they believe in the cause, we will meet the challenges to come with optimism. We are on this journey together. We are determined to succeed.

Enzo Sirna AM Chairman





THE RESEARCH

We're living longer - but at what cost?

The population of today is living increasingly longer because of amazing progress in medical science. But with the progress that allows us to avoid health threats that were once fatal, we have become vulnerable to degenerative diseases.

Alzheimer's is one of the biggest threats to living better as we age. It remains the 2nd leading cause of death. This insidious disease significantly impacts memory, intellect, rationality, social skills and physical functioning. It slowly destroys who you are. It steals your memories, your independence and finally your dignity.

There is no treatment. There is no cure. It is always fatal.

It is how one million Australians will be spending their golden years without a significant medical breakthrough.

Professor Ralph Martins and our dedicated Alzheimer's disease research team continued their important work in 2016, focusing on developing tools aiding early diagnosis and developing effective interventions and treatments.

Diagnosis

The Australian Imaging, Biomarkers and Lifestyle Flagship study of Ageing (AIBL) is one of the world's largest and most comprehensive collaborative studies. One part of this study is focusing on early detection and lifestyle interventions to find an essential early diagnosis. The study has united researchers across Australia and increased collaboration with international research groups.

The long term study has now completed its seventh year of analyses with the 90 month time point reached in 2016. The long term nature of AIBL means information gained from the collaborative studies' extensive psychological, cognitive and lifestyle assessments, blood analyses and brain imaging is considered one of the highest impact collections of data world-wide.

The extensive use of brain imaging since the study began has been a major strength providing important and novel insights into the early development of Alzheimer's disease.

Along with the data collected, the inclusion of participants including 70% healthy older people, and 30% participants showing mild cognitive decline (MCI - measurable early memory loss) has already contributed to the development of new criteria for the diagnosis of Alzheimer's. It has also assisted the design of early intervention trials intended to prevent the development of Alzheimer's.

The Foundation continues to support this important work to develop earlier and more accurate diagnosis through its direct support of brain imaging via its state government imaging grant. In 2016, 283 specialised scans were undertaken the greatest number of annual scans since the grant commenced.









The ability to track amyloid build up in the brain will assist in determining the effectiveness of particular Alzheimer's disease treatments and interventions.

Another offshoot of the AIBL study has been the **NeuroVision study** which started in 2013. The aim was to determine if a simple eye test could detect amyloid in the retina. The trial utilised participants from the AIBL study who had already undergone amyloid brain imaging.

200 participants had a basic eye assessment then consumed a daily curcumin shake for a week before the eye test was repeated. The results of these eye tests were compared with their previous neuro imaging results. As a result of the initial promising results a second study was undertaken to assess 100 of the original participants over a longer time span. The second stage finished in February 2016.

A third trial began in late 2015 to assess 20 people aged between 40 and 60 years. This stage evaluated retinal amyloid in healthy control individuals with no cognitive problems. Stage three also finished in February 2016.

The great work by our researchers coupled with fantastic commitment and support from our study participants was behind discussions for a fourth stage of the trial (which commenced in February 2017).

The preliminary findings of this

ongoing study were submitted to the Alzheimer's Association International Conference (AAIC) July 2016.

Causes

The Australian Alzheimer's Research Foundation is a partner in the **Dominantly Inherited Alzheimer's Network (DIAN)** observational study. This unique international effort involves 28 sites across eight countries. This study investigates individuals from families who are effected by early onset inherited Alzheimer's disease, a rare form of the disease caused by genetic mutation.

The information gained from participants in this study allows the testing of potential therapies to prevent, delay, or reverse the development of disease symptoms. The results will be invaluable, not only for those at risk of inherited Alzheimer's but also those affected by the more common older onset disease.

The Foundation is also participating in the **DIAN Clinical Trials** – a multicentre study of two potential disease modifying therapies in individuals at risk for or with dominantly inherited Alzheimer's disease. This commenced at the Foundation's Clinical Trails Division in April 2014 with four patients currently randomised to this important trial.

Prevention and Delay

Valuable information gained during the AIBL study revealed that a third of participants over 60 years old showing no cognitive impairment had amyloid build up in the brain. This information has guided the development of the **Testosterone Trial**, a groundbreaking study investigating the effect of Testosterone and DHA (the Omega-3 fatty acid found in fish) in delaying or preventing the onset of Alzheimer's.

A clinical trial has been developed to assess the effect of testosterone supplementation on cognition in men over 60 years of age. An early recruitment drive delivered over 3,200 enquiries. Following screening and assessment the Foundation has identified 100 men who will begin brain imaging testing. A second trial site at Macquarie University in Sydney is also being negotiated and it is expected that a further 100 eligible participants will be recruited to join the trial.

This study is being made possible by generous contributions from our supporters, as well as grants from the WA Government and Lotterywest and invaluable support from Macquarie University.

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Lifestyle

Studies show that an extended period of time exists between the brain beginning to develop Alzheimer's and the cognitive decline that leads to diagnosis. Further research suggests you can make simple lifestyle choices that may reduce your risk of developing dementia.

Previous work in the study of exercise and brain health found that people undertaking higher levels of physical activity have lower levels of brain amyloid (the toxic protein implicated in Alzheimer's disease) and larger volume of a brain region important in short-term memory. Results also showed that individuals undertaking more intense levels of physical activity performed the best on tests of memory and thinking. Further research is evaluating the effect of a six month high-intensity exercise intervention versus lowintensity exercise on measures of brain volume and connectivity, as well as performance on tasks assessing memory and thinking.

To date there are positive indications that certain lifestyle factors have a beneficial effect on cognition and markers in the brain. As well as exercise, study results also suggest that following a healthy Mediterranean diet, ensuring social and mental engagement is maintained, and having a good quality 6-8 hours of sleep each night are beneficial in slowing the decline in cognitive function.

Clinical Trials Division

The past year has been busy and productive for the Foundation's small clinical trials division led by A/Professor Roger Clarnette. The team based at the Hollywood Specialist Centre took part in a number of clinical trials looking at different treatment agents targeting mild cognitive impairment or mild to moderate Alzheimer's disease.

These trials require a strong commitment from participants and family members to regularly visit the clinic for assessments, blood sampling, imaging and other appointments. The Foundation is very grateful to the contribution by those involved. By taking part in a clinical trial our participants are helping researchers to learn more about ways to prevent, slow or perhaps even reverse the devastating effects of Alzheimer's disease.

The clinical trials division has been selected for a number of new trials heading into 2017. These trials are looking at new novel ways in the fight against Alzheimer's disease in addition to those targeting amyloid accumulation. Many have received fast track designation from the FDA to facilitate the development and expedite the review for these trial treatments.



The following is a snapshot of trials that were underway in 2016:

exclude mental retardation

STUDY NAME AND ELIGIBILITY	SCHEDULE
 Lilly - LLCF/Navigate-AD Phase 2 Male or female and age is between 55 and 85 years Has an identified, reliable, study partner (who spends 10+ hours a week with the subject) Diagnosed with mild Alzheimer's disease Subject must be able to ingest oral medications 	Monthly visitsDaily medication (tablets)12 months duration
 Biogen - Engage Phase 3 Aged 50 to 85 years old inclusive, at the time of informed consent Has an identified, reliable, study partner (e.g. family member) Must have mild cognitive impairment due to Alzheimer's disease or diagnosed with Alzheimer's disease Must have at least 6 years of education or work experience to exclude mental deficits other than mild cognitive impairment or mild Alzheimer's 	 Monthly visits for infusions. Monthly medication (dosage dependant on weight) 22 months duration
 vTv Therapeutics - Steadfast Phase 3 Males and females aged 50+ years of age at screening Diagnosis of probable Alzheimer's disease Must be on a stable dosage of cholinesterase inhibitor / Memantine Subject must be able to ingest oral medications Has an identified, reliable, study partner (who spends 10+ hours a week with the subject) Weight between 45kgs - 110kgs 	 Visits every 3 months Daily medication (tablets) 21 months duration
 PAREXEL - Amaranth Phase 2/3 Male or female, aged 55 to 85 years inclusive at signing of informed consent form Has an identified, reliable, study partner (e.g., family member) Must have mild cognitive impairment due to Alzheimer's disease or diagnosed with Alzheimer's disease Must have completed 6 years of formal education and have a history of academic achievement and/or employment sufficient to 	 Monthly visits Daily medication (tablets) 24 months duration



PARTNERSHIPS

Our internationally acclaimed researchers continue to undertake leading edge projects to understand the causes; develop an early diagnosis; identify effective treatments; find a cure; and treat the symptoms of the disease. They will continue to collaborate with colleagues and make ground-breaking successes for one imperative – to ensure Alzheimer's disease is not in your future.

Cooperative Research Centre (CRC) for Mental Health

The Australian Alzheimer's Research Foundation contributes to the work of the Cooperative Research Centre (CRC) for Mental Health. The CRC partnerships bring together industry, universities, research institutions, and clinical end users. The CRC for Mental Health seeks to discover and develop biomarkers for early diagnosis and treatment of mental illnesses and impairment, including those conditions caused by neurodegenerative diseases.

Since its establishment by the Federal Australian Government in 2011, significant progress has been made across a number of CRC for Mental Health projects.

The Australian Alzheimer's Research Foundation contributes significant funding to the CRC for Mental Health and remains very proud of achievements to date. These include:

 Identifying several novel biomarkers that can reliably predict whether a person has an elevated level of amyloid protein in the brain, a possible predictor for the development of Alzheimer's disease. This is a very promising lead to developing an inexpensive, reliable blood screen for people with presymptomatic Alzheimer's disease who would be ideal candidates for early intervention therapies.

- A new brain imaging method is in development which will accurately determine iron levels in the brains of people who are developing neurodegenerative diseases. This method will enable clinicians to predict whether an individual with a known risk factor for Alzheimer's disease is likely to exhibit slow or rapid decline of cognitive function when clinical disease develops.
- Western Australian researchers led by Professor Ralph Martins are now involved in a new collaboration with the Baker Heart and Diabetes Institute (Baker IDI) to discover novel lipids (fats) which may act as biomarkers for Alzheimer's disease. We expect this work will contribute greatly to an understanding of the role lipids play in Alzheimer's disease.
- The CRCMH continues to run programs to develop the next generation of mental health researchers. In 2016, PhD students received unique training on developing collaborations with other researchers, communication and ways to have their research taken up by industry or community groups.

KARVIAH

The KARVIAH study is located within the Anglicare (previously Anglican Retirement Villages -ARV) in Sydney. This study is an excellent example of a unique collaboration that delivers research direct to the aged care industry, applies new technology and procedures, and furthers knowledge in the field.

Participants undertook a

comprehensive lifestyle assessment including a health review, neuropsychological tests, blood tests, three brain images (MRI, PET FDG & PET Amyloid) and retinal imaging. The next step in this study examined the influence of the Indian curry spice curcumin in the prevention of Alzheimer's disease.

The study has shown that up to 30% of participants recruited in this research have beta-amyloid levels in the brain which are consistent with the pre-clinical stages of Alzheimer's disease. This further highlights the importance of finding approaches that will help prevent progression.

Two abstracts with preliminary findings were presented to the Alzheimer's Association International Conference in July 2016. **Committed Alzheimer's** disease research will be vital to reach an Alzheimer's free world. The Foundation's sole purpose is ensuring research continues on an international level into this disease.





Australian Alzheimer's Research Foundation



TOMMORROW Study

The Australian Alzheimer's Research Foundation is one of 59 study centres involved in the exciting international collaboration - the TOMMORROW study. Sites are situated in North America, Europe, Queensland, Victoria and at the Foundation's Stirling Highway site in Western Australia.

This novel clinical trial is conducted in collaboration with the major Pharmaceutical company Takeda.

The trial has two main goals. It aims to evaluate whether an investigational test can predict the genetic risk for developing mild cognitive impairment (MCI) due to Alzheimer's disease (AD) in the next five years. It will examine two specific genes - APOE and TOMM40. The second goal is to explore whether a drug often used in type two diabetes treatment will delay the first symptoms of Mild Cognitive Impairment due to AD in people who are cognitively normal.

The prediction of risk would allow for those who know they are at risk of developing the disease to better plan for their future (or tomorrow), and make changes to lifestyle etc. TOMM40, one of the genotypes, inspired the name. The Foundation's Perth site is the second highest recruiting site worldwide with 320 participants randomised to the study, a substantial logistical exercise.

Edith Cowan University

The Foundation values its strong partnership with ECU. This is centred on Foundation support for Professor Ralph Martins, ECU's Foundation Professor of Ageing and Alzheimer's and the Foundation's Director of Research.

During 2016, the Foundation continued to provide the facilities for the people centred/clinical component of Professor Martins' work. Through its various study centres and labs in Nedlands, study participants were able to visit for blood, memory and medical assessment. The detailed research work - in specialised fields including genetics, lipidomics and proteomics then occurred in fit for purpose labs at ECU Joondalup. Much of this work was funded through the Foundation's contribution to the CRC for Mental Health, with Professor Martins leading the CRC's Perth neurodegeneration program.

The Foundation is committed to continuing and strengthening this partnership and help fight Alzheimer's disease as effectively and rapidly as possible. In 2017, ECU staff will move into the Foundation's new facilities in the **Ralph and Patricia** Sarich Neuroscience **Research Institute.**



THE PERSONAL IMPACT

"Learning about Alzheimer's disease and how it will eventually effect Nan has been really hard. I know we'll lose her long before we should"

Emily

Alzheimer's disease doesn't discriminate. Wives, husbands, partners, sons, daughters, grandchildren, colleagues and friends – all experiencing someone they love lose their precious shared memories today.

Emily is learning to live watching someone she loves lose a battle with Alzheimer's disease.

Emily's family moved to live with and support her Nana when she was diagnosed with Alzheimer's.

Emily shares how Alzheimer's is affecting her Nan and her whole family.

"We all have to learn to live with Nan's Alzheimer's - but it gets harder every day.

Sometimes we have to remind Nan of sad things. My Nan had a great friend who sadly passed away a few years ago. He was like a member of our family for a very long time. But Nan still asks why he doesn't come over anymore. She can't remember that he died. We have to remind her that he is gone, again and again.

I know that Nan will forget me one day. On the day of my Year 12 Ball, I was getting ready at the house. The makeup lady had come and gone and my sister was doing my hair. My Nana walked past and said hello and went outside. I heard her talking to my dad about my sister's friend and how pretty she looked. I was 'the friend'. We have to be so patient. Stories are told over and over. The stories may change with every person Nan tells them to, but we just let her carry on with her stories. I'm learning that patience is important when living with someone with Alzheimer's. Nan may even tell the story three times in one minute! But if the story is happy and it makes her happy to tell it, we let her carry on.

Nan's personality is changing. She has anxiety about her items getting stolen or people going through her bags and wants everyone to stay out of her room. She hides things around the house and then blames us because she can't find them. Most times, we let her blame us because she won't remember it soon.

It's nice when Nan doesn't need to remember. When my Nan is in her garden, it's like all her weakness and forgetfulness is gone. She doesn't need to remember dates, or names, or faces, or times, or what medication to take at what hour of the day. She can stay in the garden all morning and afternoon – digging and turning the soil, planting and watering her flowers.

Nan will keep changing. We're all still in the early stages of my Nan's Alzheimer's. I can only imagine the future impact it will have on our family. But I won't have to imagine soon.

Every single day I wish there was a cure for Alzheimer's." — Emily Unfortunately Emily's story is a common one. It might even be your own.

We know that Alzheimer's is an insidious disease. It slowly and significantly impacts memory, intellect, reasoning, social skills and physical functioning. It destroys who you are. It is how one million Australians will be spending their golden years by 2050 without a significant medical breakthrough.

Because of your support, the researchers at the Australian Alzheimer's Research Foundation are tirelessly working towards changing this future.





ALZHEIMER'S KEY FACTS



244 Australians are diagnosed with dementia every day. This will increase to 650 by 2056.



413,106

More than 413,106 Australians currently live with dementia and Alzheimer's disease.



1,100,890

Without a significant medical breakthrough this is expected to soar to 1,100,890 by 2056.



Alzheimer's remains the 2nd leading cause of death.



291,163

There are an estimated 291,163 paid and unpaid carers looking after people with dementia. This will increase to 775,960 by 2056.



There is no cure for Alzheimer's.



50%

50 per cent of residents in Australian Government-subsidised aged care facilities have dementia.

FINANCIAL INFORMATION



Full copy of accounts available on request.

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THE FIGHT TO SAVE MEMORIES

The Campaign to Save Memories began in 2016 to fund the move into the Ralph and Patricia Sarich Neuroscience Research Institute (NRI) and is one step in the journey to find a cure for Alzheimer's.

The Ralph and Patricia Sarich Neuroscience Research Institute (NRI)

You've been hearing about the Neuroscience Research Institute since before construction began in 2014. The building is now almost complete and will open in a few months.

In the time the building has taken to build, Alzheimer's disease has risen from the 4th leading cause of death to the 2nd. We still do not have a cure.

We are at the leading edge in our fight against Alzheimer's. To maintain this edge and meet the challenge we are faced with, we need to grow and seize every advantage. We will become the world class research facility that we need to be to fight this disease.

The Ralph and Patricia Sarich Neuroscience Research Institute is our opportunity to meet this challenge by merging our internationally acclaimed research team - currently spread across four locations - into a brand new world class facility designed to house five of the state's premier neurological research organisations. This new facility will foster interaction, collaboration and innovation, and reduce duplication across a diverse group of neuroscience specialists. In this new environment the team will build on their fledgling work examining the very important link between hearing loss and dementia, working with colleagues at Ear Science Institute Australia. Researchers will also be able to develop their work in areas like Parkinson's disease expanding our partnership with research groups at Perron Institute (formerly WANRI).

The benefits of being part of this exciting facility are significant. Not only will the consolidation of the Foundation's team assist research initiatives, we will reduce duplication and improve operational efficiency.





Barry Cable's Ride for Memories

Barry Cable's Ride for Memories supported by AHG was a successful launch of the campaign. Barry Cable (AFL legend) and his good friend Josh Catalano (Catalano's Seafood and MasterChef series 1) cycled 1000km from Esperance to Perth in six days. They rode through storms and hail, beautiful countrysides, and freezing cold mornings to raise awareness and funds for Alzheimer's research. With stops in several towns along the way, community members and sports groups were given an opportunity to meet Barry and talk to Foundation staff about Alzheimer's disease.

A variety of fundraising initiatives, including a virtual ride were run alongside the ride. Barry and Josh cycled 1000km in six days, but the virtual ride gave an opportunity for the community to raise funds to help find a cure for Alzheimer's. "Josh and I supported this campaign to increase awareness of how important Alzheimer's research is, and raise the funds needed to make significant inroads into finding a cure. I don't want anyone else's mates or family to go through the suffering of this disease."

Barry Cable

Campaign Partners

Several organisations joined the many individuals already supporting Alzheimer's research, both for the ride and beyond. Our thanks go to AHG, the main sponsor of the ride, Perth Public Relations (PPR), The West Australian, and the West Coast Eagles for their support.

The Lions Club are also long term supporters of the Foundation and they continue to raise funds through their National Project for the NRI. From 2014 to 2016 they raised \$246,000 to fund equipment for Alzheimer's research in the centre. Their ongoing support is invaluable in ensuring that researchers have access to the cutting edge equipment their research requires.

This Lions Clubs National Project builds on eight years of assistance from Lions Clubs within Western Australia, to assist in the raising of funds and to promote the awareness of the disease to members of the Lions Family and to the community. We are very grateful to the local Lions leadership group for this amazing effort.

Thank You

Your generous support will help to preserve the memories, social skills and physical functioning of those that might develop Alzheimer's disease in the future.

You will be part of the future significant medical breakthrough that makes Alzheimer's a distant memory.

We are indebted for the support of all our donors which is critical to sustaining research efforts towards understanding, early diagnosis and prevention of Alzheimer's.

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