

HUNT FOR A CURE: MS AUSTRALIA COMMITS \$4.5 MILLION TO CUTTING-EDGE MS RESEARCH

Australian research to uncover the genes that could repair the damage inflicted by multiple sclerosis (MS) will soon be underway; one of 17 cutting-edge projects to receive funding from MS Australia's latest \$4.5m grant round.

Ranging from one-year innovative studies to major five-year senior fellowships, the newly funded projects focus on key MS research priorities, including genomics, treatments for better sleep, research into the impact of diet and lifestyle changes, and studies harnessing new technologies such as artificial intelligence (AI) to aid in identifying MS progression.

Associate Professor Justin Rubio, from The Florey Institute of Neuroscience and Mental Health, spearheads an innovative project that seeks to uncover genes involved in the progression of MS. This work is crucial as the progressive stages of MS are most difficult to manage.

This research has the potential to provide significant clues about how progression works at a genetic level, with the ultimate aim of using this information to slow the worsening of disability in people with MS.

Leveraging innovative laboratory techniques, Associate Professor Rubio and his team will integrate various genomic data sources, from single cells to human populations, to discover genes involved in progressive MS and how they fit into the MS puzzle.

Associate Professor Rubio says the innovative study promises to transform treatment strategies for MS to prevent the disease from advancing.

"This project seeks to identify genes involved in how MS progresses and whether this information can be used to slow damage that occurs in the brain of people living with MS," explained Associate Professor Rubio.

"Once identified, these genes can pave the way for novel drug discovery programs."

MS Australia CEO Rohan Greenland says the significant investment in MS research demonstrates the organisation's ambitious approach to combat the disease.

"These research projects ensure we're not merely seeking answers, we're actively pursuing them," Mr Greenland said.

"Our goal is to explore new and exciting areas within the field of multiple sclerosis to uncover new approaches to managing and ultimately defeating MS as soon as humanly possible."

Dr Julia Morahan, Head of Research at MS Australia, says the grant funding plays a pivotal role in nurturing and growing the MS research workforce in Australia and accelerating vital research outcomes.

FROM THE CEO

ROHAN GREENLAND



I've just signed up to do my fourth May 50K, and this year, I'm again running for two very special people, my cousin Clare and my niece's partner Joseph. Clare has primary progressive MS and has enrolled in the OCTOPUS clinical trial in the UK, partnered with our PLATYPUS trial here in Australia.



PHOTO (L-R): Rohan with his niece's partner Joseph and cousin Claire.

While Clare was diagnosed with late-onset MS, Jo was diagnosed in his early 20s following the onset of problems with his vision. They motivate every step I take as I train for The May 50K and this year's centrepiece, a Half Marathon in Canberra. Jo is also a runner, and with his MS well

managed, likes to do parkrun on Saturday mornings with my niece, Alice.

While many people with MS have significant levels of disability which prevents them from participating in running or walking activities, there is plenty of evidence - as the Cleveland Clinic advises - suggesting that exercise "decreases the severity of various MS symptoms, including fatigue and depressive symptoms, improves walking and balance, and enhances the quality of life".

Jo can leave me in his dust, but that won't deter me from lacing up, pestering all my friends and colleagues, and raising as much as I can to fuel the research that is taking us faster and further down the pathways to cures.

Please join me, and thousands of others, in what is a fabulous, fun and fundamentally important challenge.

A stylized, handwritten signature in black ink, appearing to read "Rohan Greenland".

Rohan Greenland
CEO, MS Australia

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“These grants invest in and empower established leaders in the MS research community as well as up-and-coming talent, ensuring Australia remains a global leader in MS research,” Dr Morahan said.

“Through this latest grant round, MS Australia is funding collaborations between researchers and clinicians designed to fast-track the translation of research into real benefits for people living with MS.”

MS is the most commonly acquired chronic neurological disease affecting young adults who are often diagnosed between the ages of 20 and 40.

Alarming, MS prevalence is on the rise in Australia and worldwide at an accelerating rate, with over 33,000 Australians currently diagnosed.

MS Australia President Associate Professor Des Graham thanked the state and territory MS Member Organisations and the MS community for supporting MS research.

“We are incredibly grateful for the generous support of our donors and funding partners for bringing hope to everyone affected by this disease,” says Associate Professor Graham.

“With MS on the rise, both here in Australia and across the globe, MS Australia is intensifying its commitment to halt its progress. Today’s announcement is a testament to this commitment.”

Highlighted Research Projects

Dr Belinda Kaskow, affiliated with Murdoch University, the Perron Institute, and The University of Western Australia, WA, will use her Incubator Grant to study Killer Immunoglobulin-like Receptors (KIRs), which are proteins on immune cells that control immune responses. In MS, where the immune system attacks the brain and spinal cord, understanding KIRs could lead to better treatments.

Dr Chenyu Wang and Professor Michael Barnett from The University of Sydney, NSW, are collaborating to develop advanced AI tools for analysing MRI scans to detect MS progression before symptoms appear.

This early detection will allow for timely interventions to prevent future disability. The goal of this research aligns with the Paired Fellowship’s objective of translating conceptual ideas into practical applications in clinical settings.

Associate Professor Yasmine Probst from the University of Wollongong, NSW, is investigating the impact of weight loss on people living with MS.

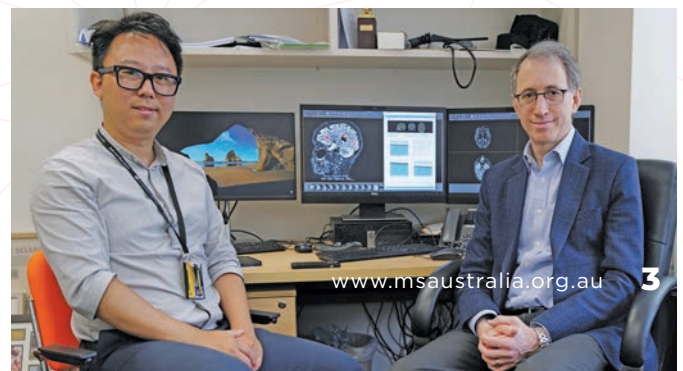


Associate Professor Probst and her team will conduct a randomised controlled trial to help people with MS improve their diet, exercise, and overall self-management. By promoting positive behavioural changes, the aim is to empower people with MS to take control of their condition.

Dr Laura Laslett from the Menzies Institute for Medical Research, University of Tasmania, TAS, will study the link between poor sleep and MS. Her project aims to find treatments for sleep issues and understand how changes in sleep patterns affect overall sleep quality in people with MS. Using data from tracking watches and clinical trials such as TAURUS.2, as well as the Australian MS Longitudinal Study (AMSLS), Dr Laslett plans to design future trials to address sleep problems in MS. This research will help improve understanding and management of sleep issues in the MS community.



Associate Professor Justin Rubio, from The Florey Institute of Neuroscience and Mental Health, VIC, has been awarded a Senior Fellowship to lead research using diverse genomic data sources as his team aims to uncover genes linked to progressive MS. This information will be used to identify new treatment targets to slow or prevent MS progression.



RESEARCHERS DISCOVER LINK BETWEEN COPPER AND DEMYELINATION IN MODEL OF MS



In this study, published in *Metalomics*, researchers funded by MS Australia investigated the role of copper in the demyelination process, where the protective coating around nerves are damaged in MS.

They used cuprizone, a compound known as a chelating agent, that grabs onto copper and mimics MS-like lesions, causing demyelination in a laboratory model.

What did the researchers do?

The researchers thoroughly investigated copper levels during a 40-day cuprizone treatment period in the laboratory model.

Employing advanced technologies in mass spectrometry, they precisely separated copper into soluble and insoluble fractions across various brain regions, with a specific emphasis on the large white matter tract that connects the two hemispheres of the brain known as the corpus callosum.

Demyelination in the corpus callosum is a prominent feature of MS and may account for impaired performance on complex tasks.

What did the researchers find?

The researchers found demyelination within the corpus callosum was closely associated with a notable reduction in soluble copper, while insoluble copper remained unaffected.

To explore potential treatments, the researchers gave the model a copper compound that could get into the brain by crossing what is known as the blood-brain barrier.

This treatment increased copper levels, especially the soluble fraction, and significantly reduced the damage caused by cuprizone in the corpus callosum.

What does this mean for people with MS?

This study suggests that having insoluble copper in the brain and spinal cord might contribute to the damage observed in demyelinating conditions like MS. On the other hand, more soluble copper may be beneficial.

While further research is needed, this study supports the idea that delivering a copper compound directly to the brain could help preserve myelin in the brain and spinal cord in people with MS.

These findings bring hope for gaining deeper insights into how diseases like MS function, revealing new possibilities for effective treatment approaches in the future.

By understanding more about the role of copper in demyelination, we come closer to improving the health and wellbeing of individuals with MS.

RESEARCHERS SEEK TO REDEFINE CONCEPT OF BRAIN HEALTH FOR PEOPLE WITH MS



The surge in brain health research, particularly in the context of multiple sclerosis (MS), has prompted researchers at the University of Wollongong to explore this interesting area.

Reflecting MS Australia's longstanding interest in advancing knowledge in this domain, MS Australia-funded researcher Olivia Wills, conducted a scoping review aimed at gathering evidence of "brain health" in the MS landscape and published the findings in *The European Journal of Neurology*.

What did the researchers do?

Ms Wills followed the Joanna Briggs Institute's methodological framework. Six search strategies were employed to retrieve both scientific and grey literature sources (a wide range of information produced outside of traditional publishing and distribution channels).

A total of 70 evidence sources, including 34 peer-reviewed and

36 grey literature documents, were considered for inclusion.

Qualitative analysis methods were applied to organise the evidence based on definitions of brain health, outcome measures, and brain-healthy lifestyle elements.

What did the researchers find?

Among the eligible sources, just over half (57%) provided a definition of brain health. The most common definition focused on the idea of neurological reserve, which is a theory about the brain's ability to adapt and maintain good function.

Twenty-nine outcome measures for brain health were identified, with magnetic resonance imaging (MRI) metrics being the most frequent (83%).

Notably, physical activity emerged as the predominant brain-healthy lifestyle element (44 sources), followed by smoking avoidance (26 sources) and diet (24 sources).

What does this mean for people with MS?

The findings underscore the significance of prioritising brain health in the management of MS, both in terms of the disease itself and lifestyle choices.

The proposed shift from a purely medical lens toward a broader biopsychosocial perspective supports the need to consider factors beyond the traditional biomedical model.

Acknowledging the influence of various elements, such as physical activity, smoking cessation, and diet, provides a more holistic approach to optimising brain health for individuals living with MS.

By identifying brain-healthy lifestyle elements, this review offers crucial evidence for public health bodies, justifying further research into behaviour change strategies to improve brain health and disease outcomes for people living with MS.

UNFINISHED BUSINESS: GLOBAL COLLABORATION, NDIS REFORM AND SECURING A GREATER FUNDING FOOTPRINT



Associate Professor Des Graham was elected unopposed for a second and final term as MS Australia President and Chair at the 2023 Annual General Meeting held on 28 November 2023.

We sat down with Des to discuss the three key areas he wishes to progress during his term as Chair, his plans for succession, and the motivation and thinking regarding his decision to serve only two years of the three-year term.

Associate Professor Des Graham boasts a proud record of supporting those not in a position to advocate for themselves. That drive in pursuit of social justice was recognised with a Human Rights Award in 2002, well before he himself was diagnosed with MS in 2009.

“I’ve always possessed a willingness and a desire to actively pursue the social justice agenda without being radical. And now, as a person with MS, I’ve got a knowledge bank and lived experience insight that others don’t have, and I think that is important.

“And when I combine that with my career and the skillsets that I acquired over 25 years as a clinician, as a bureaucrat actively involved in the development of the National Disability Insurance Scheme and the Rudd Government health reforms, I think that my background and passion

fuels my ambition to continue to contribute to the MS community.”

Des has identified three key areas he wishes to see a continued focus over the next two years, building on the strong record of success in recent years.

The first of those is to further cement MS Australia’s place as a leading partner in international collaborative research efforts – chiefly through the establishment of research prevention platform to end MS.

“We’re incredibly proud to currently be in discussions with Canada about jointly leading those efforts. And of course, what’s most exciting is the promise this work holds to move us faster toward a cure.”

Des is also determined to increase MS Australia’s funding footprint, to deliver a consistent funding source, and in particular, additional Commonwealth Government MS research investment.

“One of our most important roles at MS Australia is to advocate for Governments to invest in critical MS research. And that priority remains unchanged. And notwithstanding our record of success in this space, I believe we can attract and consolidate a bigger and more stable funding footprint over the next two years.”

Lastly, Des is determined to build on MS Australia’s successful efforts to realise a better National Disability Insurance Scheme for Australians living with MS.

“I am incredibly pleased to see the impact MS Australia has already had in advocating for changes that would address the current failings of the NDIS. Together with Neurological Alliance Australia (NAA) chaired by MS Australia CEO Rohan Greenland, MS Australia has campaigned publicly, visibly and successfully for changes that would deliver better access and outcomes for Australians with MS that require access to the NDIS.

“Our advocacy efforts do not end with the handing down of the NDIS Review’s final report. We stand ready to work with the Commonwealth Government to see the Review recommendations implemented, and to continue to work with the National Disability Insurance Agency to see our ambitions for the establishment of a Neurological Advisory Panel embedded within the NDIA fully realised.”

Des Graham is proud of his achievements and contributions to MS Australia to date.

“Others will judge me regarding my strengths and the things I have delivered. For me, the most rewarding achievement to date has been our efforts to bring the

MS community together. Not only the successful union between MS Australia and MS Research Australia, but also the strengthening of the relationships with and between the state and territory MS Member Organisations MS Plus, MSWA, MS Queensland, and MS SA and NT.

“At the time of the consolidation there was great concern about what would happen to research. And I am proud that not only did we demonstrate that we are good stewards; we actually gave more hope to more people, people living with MS and researchers alike because we invested more in research.

And what of Des’ future plans?

While not quite ready to hang up his hat, Des does have an exit strategy firmly in place, and will complete only two years of his three-year term.

“I wanted to provide MS Australia with a reasonable exit plan and to allow for succession planning and a smooth transition for the in-coming Chair.

“I enjoy working with our CEO, Rohan and I recognise we have a great and very capable staff team at MS Australia. I don’t believe the momentum we have built up would be well served by my leaving at this juncture.

Des also has compelling personal motivations for vacating his role in two years.

“I’ve got a couple of grandchildren now who have made an enormous difference to my wife and I. The grandkids are only six months old but they have enriched both of our lives. For me, being a granddad is an amazing experience.

“And over the last 12 months, I have experienced my MS

symptoms more now than ever before. So it’s important to me that I give myself the best opportunity to go off and spend quality time with my wife, my children and my grandchildren.

“When I complete two years of my current three-year term, that will conclude all my active roles within the MS community. I will retire. I will of course watch from the sidelines with enormous interest.

“I expect there may be times when I am enormously frustrated, and at other times incredibly encouraged by what will be happening in the MS sector.

“But regardless, I hope I have made a contribution to a solid foundation that can be built on and leveraged for the good of the Australian MS community for many years to come.”

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MEET THE RESEARCHER

ASSOCIATE PROFESSOR YASMINE PROBST

UNIVERSITY OF WOLLONGONG, NSW



TELL US AN INTERESTING FACT ABOUT YOURSELF

I am a mum of three kids and most weeks I spend seven days a week at representative football (soccer) with my kids.

WHAT INSPIRED YOU TO GET INVOLVED IN MS RESEARCH?

As a person with MS who is also trained in nutrition, I saw the very real struggle that many people face in their relationship with food. From childhood, I have always had a love for food and my aim is to help others who are diagnosed with MS to not only love food but also to appreciate the many benefits that food can provide to our health.

WHAT DO YOU THINK HAS BEEN THE MOST EXCITING DEVELOPMENT IN MS RESEARCH?

One of the most exciting developments is the growing understanding of the re-myelination of our central nervous system. While we are still at the very early stages of understanding the effect of what we eat and on disease progression in MS, I hope the future of MS research will see a role for food and dietary patterns in relation to this understanding re-myelination even further.

TELL US ABOUT YOUR CURRENT RESEARCH PROJECT

We will be conducting a multi-site, clinical trial study that makes use of our learnings in recent years of the flexibility of delivering health care using remote forms of communication. Our study will consider elements of nutrition, exercise and psychology and compare these with usual MS care. We know that excess weight early in life can influence a person's risk of developing MS. We also know that carrying extra weight, when a person has been diagnosed with MS, creates added inflammation in the body and in turn may result in increased symptoms and/or progression.

The main outcome for our study is weight loss and management in people living with MS who are also living in a bigger body. However, the focus will not be on the weight but on the whole person and their personal circumstances.

WHAT DO YOU ENJOY MOST ABOUT WORKING IN THE LAB?

My greatest enjoyment is sharing my MS journey with others while also helping them to untangle the complexity of the information that is thrust upon us as people living with a chronic neurodegenerative condition.



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