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MS RESEARCH AUSTRALIA

NEXT

THE OFFICIAL NEWSLETTER OF MULTIPLE SCLEROSIS RESEARCH AUSTRALIA

A blood test to distinguish between MS subtypes

MS Research Australia is proud to have supported the work of Professor Gilles Guillemin and Dr Edwin Lim. Their latest work has hit the media headlines with 1 million views on the ABC News website for a potential blood test distinguishing between the different types of multiple sclerosis (MS).

Professor Guillemin and Dr Lim from Macquarie University, NSW, published evidence for the first-ever blood biomarker – a chemical identifier in the blood – for distinguishing the different types of MS.

MS has three commonly recognised forms, relapsing-remitting MS, secondary progressive MS and primary progressive MS. The various forms of MS have very different outcomes and treatment implications. Traditionally, distinguishing between MS subtypes has been a challenging process requiring both time and an array of tests. But this looks set to change, thanks to this research.

Professor Guillemin explains 'This is a significant discovery because it will facilitate the ability to quickly and simply differentiate between the three types of MS and will allow clinicians to adapt their treatment for MS patients more accurately and rapidly.'

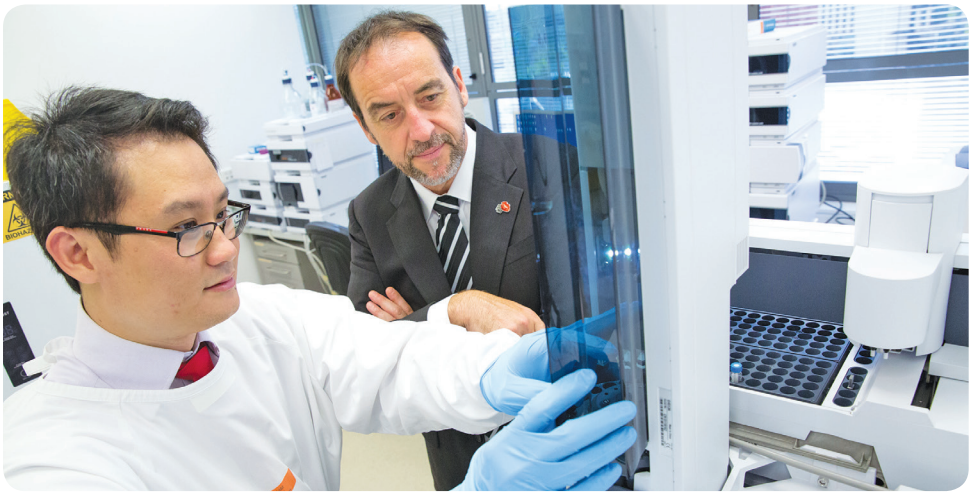
This research was funded in its infancy through the MS Research Australia incubator grant program which provides seed funding to get innovative new MS research ideas off the ground. This initial success was followed by an MS Research Australia Fellowship for Dr Lim, as well as further highly competitive NHMRC funding. Our analysis has shown that, on average, MS researchers have been able to leverage our incubator grants by 27 times more than the initial funding.

While the blood test holds promise to assist in the management of MS in the clinic, the research also sheds important light on how the biology of progressive MS differs from that of relapsing MS. It is thought that progressive disease involves a shift from an inflammatory condition in which immune cells come into the brain from the blood, to a situation where immune and support cells that reside in the brain contribute to ongoing damage to neurons. These resident cells are known to produce and process the chemicals that form the basis of this blood test. A detailed knowledge of these processes will allow us to develop targeted treatments for both progression and symptom management.

The blood test may also play a key role in the clinical trials for new treatments that aim to stop and reverse progressive disease. One of the key factors currently hindering the development of treatments is accurate and rapid tests, or biomarkers, such as this blood test, that can measure within the short time-frame of a clinical trial, whether medications are working.

Dr Matthew Miles CEO of MS Research Australia said 'We are excited to see the translation of this, initially fundamental research, into a clinical test. It has the potential to be the first blood biomarker to diagnose the type of MS patients have, meeting one of the unmet needs in the clinical management of MS'.

The researchers believe that a clinical test could be available within two years. This entire process would never have been possible without the incredible funding support of the Trish MS Research Foundation, MS Angels (Sydney) and several other generous individuals.



Dr Edwin Lim and Professor Gilles Guillemin

Image source: Carmen Lee, Macquarie University

Listening to the MS community is crucial. We are proud to have woven the important results of our community consultation on MS Research Priorities into our upcoming strategic plan 2017-2019. We look forward to sharing this plan with you soon.

It was incredibly inspiring to see the huge response to the survey with over 1000 people taking part and providing a strong, academically robust and independently confirmed representative sample of the MS community.

The results were clear. The top three research priorities remain unchanged;

- a cure for MS
- better treatments for MS
- prevention of MS

These top 3 priorities were the same regardless of the level of impact that MS has on individuals. In fact, research to improve symptom management and rehabilitation came lower down the list of priorities, even for those more severely affected by MS. However, the results do show that we need to increase attention on some of the more neglected symptoms of MS including pain, fatigue and cognition.

Interestingly, the survey also provided a contemporary picture of the impact that MS has on the lives of people with MS in Australia. The results showed that 79.6% live with either no signs or mild to moderate symptoms and/or disability. 20.4% classified their MS as severe. This is aligned with international research that indicates there has been significant improvements in the long term outcomes for many people with MS over the last decade or more.

But there is still so much more work to be done to ensure that everyone with MS (and not just some) can live a full and symptom-free life. Of paramount importance is that the damage done by MS can be stopped and reversed. Better still, we will continue to work tirelessly towards a world in which MS is prevented from taking hold in the first place.

Dr Matthew Miles, CEO

New funding for MS research starting in 2017

MS Research Australia is delighted to announce a further $1.5 million in research funding commencing in 2017.

The 17 new project grants, innovative pilot (incubator) grants, scholarships, fellowships and travel awards will run over the next one to three years. They bring the total number of ongoing investigator-led projects receiving MS Research Australia funding to 45.

Every year, MS Research Australia disburses over $3.5 million to investigator-led research projects and national collaborative research 'platforms'. Dr Matthew Miles CEO of MS Research Australia said 'This is only possible because of the ongoing support of our many dedicated donors and funding partners.'

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The number and quality of applications we receive continues to grow every year, making the funding decisions exceptionally challenging. Sadly, there are many important projects that miss out on funding due to the limited funds available. This figure was $4 million in 2016. However, our robust grant review procedures ensure that the funding we do have is allocated to the most rigorous science, with the greatest potential to make an impact for people affected by MS.

We are constantly striving to grow the pool of funding available for research and in the coming years we expect to be able to continue to increase the number of projects that we support.

The new grants cover a range of scientific and allied health disciplines, investigating the many facets of MS biology, treatment and care. These include several exciting projects focusing on the top priority for the MS community - the search for cures via repair and regeneration of cells. These projects are led by an outstanding group of emerging MS research leaders and early career scientists who represent the very strong future for MS research in Australia.

The current climate for research funding in Australia makes it even more vital that MS Research Australia supports the established world-leading Australian research groups, as well as retaining our young Australian researchers allowing them to build their careers on home soil focusing on MS. This funding includes support for emerging clinicians using their clinical expertise and knowledge to inform and develop the pathways of research. Importantly, several of the projects funded are taking fundamental research that was supported by MS Research Australia when the ideas were in their infancy and now seeing them translated into a clinical setting.

The Snapshot on page 3 provides an overview of all new projects starting in 2017.

SNAPSHOT

MS RESEARCH AUSTRALIA

PROJECTS STARTED IN 2017 FUNDED BY MS RESEARCH AUSTRALIA

NEUROBIOLOGY

IDENTIFYING THE TRIGGERS FOR MS

Florey Institute of Neuroscience and Mental Health, VIC
Associate Professor Justin Rubio is researching whether genetic changes specific to the brain contribute to the progression of MS.

DEVELOPING BETTER TREATMENTS

Centre for Eye Research Australia, University of Melbourne, VIC
Dr Peter van Wijngaarden is developing a new laboratory model of MS that targets damage to eye nerves and will enable new therapies to be tested.

Brain and Mind Centre, NSW
Dr Joshua Barton is developing a new way of monitoring brain changes in early MS using tablet technology.

A CURE FOR MS VIA REPAIR OR REGENERATION OF CELLS

Monash University, VIC
Dr Tobias Merson is determining whether stimulating brain activity can improve myelin repair.

University of Melbourne, VIC
Associate Professor Richard Hughes is developing a new treatment for MS based on peptides that promote myelin growth.

Menzies Institute for Medical Research, TAS
Dr Kaylene Young is determining whether enhancing electrical activity in the brain could lead to myelin repair in MS.

St Vincent's Centre for Applied Medical Research, NSW
Dr Michael Lovelace is travelling to McGill University in Canada to learn a new technique to isolate myelin producing cells in the human brain for research in the laboratory.

GENETICS & EPIDEMIOLOGY

University of Melbourne, VIC
Professor Helmut Butzkueven is looking at the way that vitamin D changes gene activity in immune cells in people at risk of developing MS.

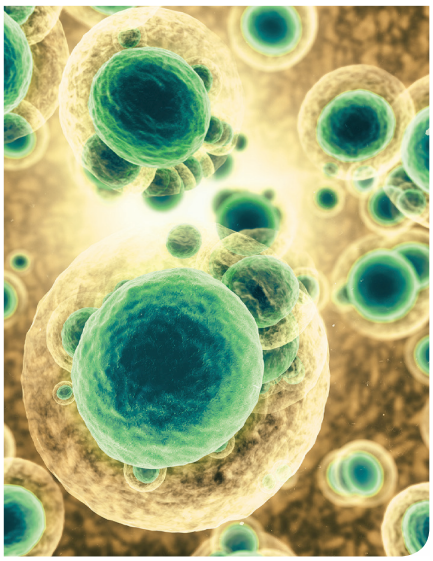
The Westmead Institute for Medical Research, NSW
Dr Grant Parnell is researching the ways that vitamin D protects against the development of MS.

Florey Institute of Neuroscience and Mental Health, VIC
Dr Chris Dwyer is examining the role of a specific gene called MERTK in MS and its effects on the immune system.

University of Newcastle, NSW
Associate Professor Jeannette Lechner-Scott is investigating whether microRNA in red blood cells can be used as a marker of progression in MS.

University of Melbourne, VIC
Dr Vilija Jokubaitis is investigating whether genetics can be used to predict future outcomes in progressive MS and ensure people receive the best treatment option for them.

IMMUNOLOGY



University of Sydney, NSW
Associate Professor Scott Byrne is determining the way that sunlight is able to suppress the immune system to develop a new therapy for MS.

University of Sydney, NSW
Angelica Panopoulos is investigating whether tiny cell fragments called microparticles are involved in the early stages of MS development.

University of New South Wales, NSW
Dr Jennifer Massey is examining the changes to the immune system following autologous haematopoietic stem cell transplant (AHSCT) for MS.

Australian National University, ACT
Dr Anne Bruestle is investigating the actions of a type of immune cell called a neutrophil in MS and looking at ways this could be neutralised.

SOCIAL & APPLIED RESEARCH

University of New South Wales, NSW
Dr Phu Hoang is investigating the effect of exercise on ankle stiffness in MS.

KEY: INCUBATOR GRANT | FELLOWSHIP | SCHOLARSHIP | PROJECT GRANT | TRAVEL AWARD

Funding for better treatments

MS Research Australia's latest grant funding round has committed funding to a number of projects aimed at developing better treatments to prevent the immune system from damaging the brain and spinal cord.

We are excited that amongst the grants in our latest funding round we have committed to funding a number of projects that carefully target the immune system to prevent relapses and progression. These include projects that will investigate the precise control mechanisms to lock immune cells out of the brain, finding genes that control the immune system, and to completely reboot the immune system.

Associate Professor Scott Byrne from the University of Sydney, NSW, has been investigating the biology behind the known link between low levels of sun exposure and an increased risk of developing MS. He previously discovered that when people have been exposed to sunlight there are changes in their immune system. This in effect traps damaging immune cells in the lymph nodes and stops them from entering the brain and spinal cord. He now aims to identify the naturally occurring molecule which is responsible for trapping the immune cells. The ultimate aim is that this molecule can be used as a specific treatment for people with MS.

Dr Anne Bruestle from the Australian National University, ACT, is also looking at another way to modulate the immune system. It is known that certain cells of the immune system called neutrophils can create net-like structures capturing and immobilising microbes. This is part of the neutrophils' role to defend the body against foreign invaders, but it can also lead to the immune system attacking the body. Dr Bruestle and her team have developed a new drug that blocks these net-like structures and has shown that it can nearly stop the disease progression in a laboratory model of MS. They are now looking to examine this phenomena in people and determine its impact on the immune system in MS. The pathway for this research into clinical trials may prove promising as the treatment so far appears to have few side effects and is inexpensive to manufacture.

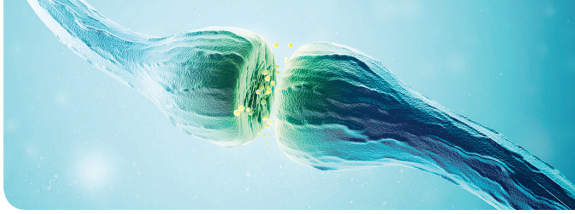
An important part of MS Research Australia's funding strategy is also to attract and retain the brightest researchers and clinicians into the field of MS research. This year our PhD scholarships have gone to two very promising young clinicians who will focus on MS research while completing their advanced neurology training.

Dr Christopher Dwyer will work with Professor Trevor Kilpatrick at the Florey Institute of Neuroscience and Mental Health, VIC, to investigate the role of a gene called MERTK in the immune system. MERTK is a gene that is strongly implicated in the development of progressive MS. Dr Dwyer will determine whether the MERTK gene acts via the innate immune cells within the brain and spinal cord (known as microglia) or via the dendritic cells in the blood. These findings will hopefully be used to develop a treatment strategy based on MERTK to target exactly the right type of immune cells in progressive MS.

Dr Jennifer Massey a clinician from the University of NSW and St Vincent's Hospital NSW will work with neurologist Dr Ian Sutton and haematologist Associate Professor John Moore to investigate autologous haematopoietic stem cell transplantation (AHSCT). AHSCT is an immunosuppressive chemotherapy treatment combined with reinfusion of blood stem cells to help re-build the immune system. Dr Massey aims to understand the effects the treatment has on the immune system and how this matches with the treatment outcomes. Her work will add to the international body of work aiming to produce treatment guidelines for the use of AHSCT in MS and could potentially lead to other strategies to reset the immune system that do not require such intensive chemotherapy treatments.

All of these important projects cross the divide between the laboratory and the clinic, generating the crucial pathway for rapid translation of research into practice to benefit people with MS.

New funding for repair and regeneration of myelin



MS results from the damage and loss of myelin, the conductive layer around nerve fibres in the brain and spinal cord. Myelin can be repaired following attacks of MS, but in progressive MS repair is incomplete, causing irreversible damage.

In the recent MS Research Priorities Survey, finding a cure for MS (via repair and regeneration of cells) was confirmed as a top research priority for the MS community. In our latest round of funding, we are building on our commitment to this field of research by supporting several new projects investigating repair and regeneration of cells, promoting myelin re-growth and restoring lost function.

Dr Tobias Merson's team at the Australian Regenerative Medicine Institute, Monash University, VIC, has previously shown that increasing the electrical activity of nerve fibres in brain tissue unaffected by MS enhances the formation of myelin on these nerve fibres. Others have also discovered that blocking electrical activity in MS brain lesions reduces the brain's ability to repair lost myelin. To further this research, Dr Merson will use laboratory models of MS to investigate whether electrical activity within nerve cells alters the ability of myelin producing cells to generate new myelin.

Dr Kaylene Young's team at the Menzies Institute for Medical Research, TAS, has recently established a non-invasive technique, known as repetitive transcranial magnetic stimulation, which can increase the amount of myelin that brain cells can make. In this new project, Dr Young and her team will test this technology in laboratory models of MS to see if it can increase the number of myelin making cells and lead to re-wrapping of nerve fibres with myelin. This magnetic stimulation is safe for human use and is already being used for the treatment of other nervous system disorders. Therefore, it is hoped that a successful outcome from this project can rapidly lead to clinical trials of much needed therapeutic options for progressive MS.

Associate Professor Richard Hughes at the University of Melbourne, VIC, will continue developing myelin repair drugs based on the brain chemical Brain Derived Neurotrophic Factor (BDNF). BDNF is a protein that controls the growth of myelin during development and is able to repair myelin after it has been damaged. However, BDNF is a large protein that is broken down by the body, and therefore cannot be used directly as a treatment. Associate Professor Hughes' team are building on research previously funded by a MS Research Australia incubator grant to synthesise smaller molecules which mimic the function of BDNF and might be a suitable therapy for MS.

Investigations into repair and regeneration are also ongoing around the world, and it is important that Australian researchers maintain close collaborations with international researchers to ensure efficient research progress. To achieve this, **Dr Michael Lovelace** from St Vincent's Centre for Applied Medical Research, NSW, will travel to Professor Antel's laboratory at McGill University, Canada. Dr Lovelace will learn how to isolate human myelin producing cells from other brain cells. Tests on these cells will determine if certain toxic chemicals produced during inflammation can be inhibited to enhance the brain's capacity to repair myelin lost in MS.

Determining new ways to enhance repair in the MS brain will hopefully lead to new therapeutic options for the progressive phase of MS. However, in order for these therapies to be tested in clinical trials we need to develop reliable methods to measure myelin repair and reversal of disability in real-time during clinical trials. Some of the other projects we are funding in this round will do just that, including Dr Joshua Barton, who will be developing new ways to track brain changes using tablet technology, and Dr Peter van Wijngaarden who will be developing a model to measure repair in the optic nerve.

RESEARCH IMPACTS & ACHIEVEMENTS

Since inception over
$31.5 million
committed to MS research

17 new grants
awarded in 2017

82 cents **in every dollar raised goes directly to funding and facilitating MS research**

Incubator grant funding model has a multiplier effect of
27:1

Kiss Goodbye to MS
raised over
$1 million
in 2016

Online research funding portal to encourage MS research

Each year MS Research Australia asks scientists to submit research proposals to improve the outcomes for people with MS.

MS Research Australia has different types of funding, including incubator grants for novel blue sky ideas, career development scholarships for scientists, full project grants and travel grants to foster collaboration. Each grant has different eligibility requirements and conditions. However, all applications must have a direct link to advancing our knowledge of MS.

Each submitted proposal goes through a robust and thorough peer review process which is highly respected in the scientific community and considered on par with the National Health and Medical Research Council.

Last year, MS Research Australia teamed up with FluidReview, a member of the SurveyMonkey group, to create an online application management solution.

"After months of preparation, we are delighted to introduce our new research grant application portal. It will streamline all of the processes making it more efficient for the researchers, reviewers and ourselves" said Dr Lisa Melton, Head of Research, MS Research Australia.

With the research funding landscape becoming more competitive in Australia, the number of applications submitted continues to increase. This new online portal will enhance MS Research Australia ability to identify the most promising Australian research with the biggest impact for people with MS in the ever rising number of applications.

Currently, the platform has received applications for the first incubator grant round for 2017, and all future grant applications will be submitted and processed online. The system will allow MS Research Australia to efficiently manage the entire application process from receiving the applications, through to the peer review and monitoring. This will make the application process more efficient for the scientists who apply for funding, the scientists that review the applications and for the administering of the process.

MS Research Australia is always striving to improve its processes leading to further efficiencies in it's already award winning operation.

Wrangling the scientific jargon

Dr Hamish Campbell is part of MS Research Australia's scientific team and is responsible for writing research information for the MS community.

Hamish Campbell, Research Development Coordinator

Hamish also oversees the NSW MS Research Network and the MS Clinical Trials Network. More recently he has been responsible for implementing an online grants funding portal making it easier for Australian MS researchers to apply for funding.

Hamish holds a PhD in molecular cell biology from the University of Otago, New Zealand. As a research scientist at the Children's Medical Research Institute, Sydney, Hamish developed an interest in the immune system, autoimmune disease and immune disorders. He has also held a lecturer position at the University of Sydney as well as being a member on various ethics, biosafety and scientific grant advisory committees, giving him a broad scientific background which is essential for his role as Research Development Coordinator.

Hamish is excited to be part of an organisation that is dedicated to realising scientific advancements and believes that through fundamental scientific research a number of discoveries will be developed that will see positive change in the lives of people with MS.

Kiss Goodbye to MS – raising funds for MS research

Kiss Goodbye to MS is the national fundraising campaign of MS Research Australia, which runs as a DIY style platform with an increased focus throughout May. The campaign calls on Australians to raise funds and awareness in their local community. The innovative thing about Kiss Goodbye to MS is that you can fundraise however you like… from wherever you like!

How you get involved with Kiss Goodbye to MS really is up to you! You can host an event from your own backyard, organise a workplace morning tea in exchange for a gold coin donation, or even get sponsored to wear red throughout May. Some set a personal challenge and ask for donations.

Great progress has been made in better understanding MS, and thanks to significant outcomes of recent MS research, new treatments have made it possible for some people to manage their MS. But we need to now ensure that this momentum does not wane and that effective and accessible treatment options are available for all forms of the disease. Our mission is simple – to find a cure for MS and there is significant evidence that tells us that we are on the right path to achieving this. Research, of course, is the key.

The Kiss Goodbye to MS community is bringing us one step closer to solving MS. Last year $1,011,000 was raised by Kiss Goodbye to MS, contributing to the funding of 17 new research projects this year. In 2017 we have set our sites even higher – aiming to raise $1.25 million for research into MS.

> "The innovative thing about Kiss Goodbye to MS is that you can fundraise however you like… from wherever you like!"

There is strong evidence to show that the proportion and amount of money raised for MS going to MS research in Australia is very low when compared with many other countries. Kiss Goodbye to MS offers the MS community the chance to raise funds for MS research directly.

Australia has some of the best researchers in the world, yet government funding for MS research is now much more competitive and harder to attain. As the largest non-government national funder, facilitator and coordinator of MS research in Australia, MS Research Australia relies on the support of the community to secure funding for crucial research.

Whether you are considering holding a fundraising ball, hosting a small get-together at home, or raising a few dollars through a personal challenge, every dollar really does make a difference.

Most Australians affected by MS now prioritise research as the most important thing in making a difference for the MS community. Our recent survey with over 1000 respondents also showed that a cure, better treatments and the prevention of MS were the top 3 priorities. These will help guide our research focus.

Kiss Goodbye to MS is your chance to make a difference! If you are considering fundraising please phone the Kiss Goodbye to MS Campaign Manager on 1300 785 717, or send an email at **kgtms@msra.org.au.**

MS Research Australia Board changes

One of the longest serving directors of MS Research Australia, Christina Gillies, is retiring from the Board after 13 years. Chris leaves with the Board's thanks and grateful appreciation for her contribution to the establishment and development of MS Research Australia.

Chris joined the board in 2004 and has seen the organisation become the largest national funder and facilitator of Australian MS research. We also have an increasing global presence in funding international MS research and collaborating seamlessly with other groups from a wide variety of countries.

Paul Murnane Chairman of MS Research Australia said that 'Chris provided leadership to stay true to the purpose of MS Research Australia, to seek the cure for MS. The effort and common sense she contributed during the establishment of MS Research Australia, and her clear view of issues throughout our development have been integral to make the organisation what it is today. Chris has made a huge contribution to the family of MS organisations over many years.'

MS Research Australia is pleased to announce the appointment of Richard Bergman to the Board. Richard is a Partner at PwC and has over 15 years' experience working with senior executives and Boards to manage Risk, Financial Crime and Cybercrime. Richard has worked in the firms assurance, consulting and forensic businesses and has global experience in managing crisis and complex investigations.

Paul Murnane said 'Richard is highly motivated and engaged with MS Research Australia and the team, his valuable professional skills and experience and his passion for fundraising will bring fresh independent thinking to the Board as we continue to strengthen and enhance our 2017-2019 strategic direction.'

Richard has been part of the MS Research Australia Leadership Council and was a founding member of the former MS Saints. He actively fundraises and leverages his networks to actively promote awareness of MS and to support the unique work of MS Research Australia in raising funds directly for MS research.

Christina Gillies

Richard Bergman

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THE AUSTRALIAN CHARITY AWARDS CHARITY OF THE YEAR 2015

NATIONAL AWARDS FOR EXCELLENCE IN FUNDRAISING fia Fundraising Institute Australia WINNER 2016

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HELP MS RESEARCH AUSTRALIA FIND A CURE FOR MS

Donate (Donations over $2 are tax deductible)

To support MS Research Australia's vital work I would like to:

- ☐ Make a one off donation of $
- ☐ Make a monthly donation of $
- ☐ Learn more about leaving a bequest in my Will
- ☐ I have already made a bequest to MS Research Australia in my Will

Contact details

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Payment method:

- ☐ Cheque (made payable to MS Research Australia)
- ☐ Direct Debit Request *(copy of service agreement can be provided on request)*

Financial institution:

BSB number:

Account number:

Account holder's name:

- ☐ Credit Card

Mastercard ☐ Visa ☐ Amex ☐

Credit card number:

Exp: CVV:

Name on card:

Signature:

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