

World-first study uses DNA to investigate who develops MS and why

30 July 2025: A world-first Australian study is using DNA to identify a person's genetic risk of developing multiple sclerosis (MS) to understand how their immune system responds to a common virus linked to the disease.

Led by Dr David Stacey at the University of South Australia, the study is part of MS Australia's latest Incubator Grant round, which supports out-of-the-box ideas aimed at opening new directions in MS research.

The project will use an innovative approach called *recall by genotype*, which selects participants based on whether they have a high or low genetic risk of developing MS. This approach has not been used in MS research, either in Australia or internationally.

The study will compare immune system and viral response markers in both groups. A key focus is the Epstein-Barr virus (EBV), a very common virus that causes glandular fever and has been shown to be a necessary step in the development of MS.

Most people are infected with EBV during their lifetime, but only a small percentage go on to develop MS. Researchers believe that differences in how the immune system responds to the virus could help explain why.

"It's like studying the immune system's blueprint before the disease starts," said Dr Stacey.

"Most MS studies compare people who already have the disease with those who don't. By focusing on people who don't have MS but carry different levels of genetic risk, we're hoping to uncover early immune system changes that might help explain who develops MS and why.

"It could also help identify early biological markers that show when MS might be starting to develop. This may lead to earlier detection, new treatments or even prevention."

The study will also examine the ethical and social implications of using personal genetic information to invite people into research, including how to communicate genetic risk effectively and ensure that participation is fully informed.

Dr Stacey's study is one of four projects funded through MS Australia's 2025 Incubator Grant program.

"Some of the most exciting breakthroughs begin with a bold question and a well-placed investment," said Dr Tennille Luker, Head of Research at MS Australia.

"Our Incubator Grants are designed to encourage new ideas while helping grow and strengthen a world-class Australian MS research community."

MS Australia's Incubator Grants have helped spark major discoveries and attract further national and international funding. For every dollar invested, researchers have secured an additional \$27 in follow-on support.

More than 33,000 Australians live with MS, a number that is increasing at an alarming rate. While treatments have improved significantly, there is still no cure.

MS Australia funds research across the full spectrum of the disease, including investigations into its causes, the development of new treatments, improvements in quality of life, and ultimately, the pursuit of ways to prevent and cure the disease.

“Our mission is to accelerate research and improve outcomes for every person living with MS,” said Rohan Greenland, CEO of MS Australia.

“By backing ambitious science and investing in brilliant researchers, we’re creating the conditions for breakthroughs to emerge.”

ADDITIONAL PROJECTS FUNDED IN THE 2025 INCUBATOR GRANT ROUND

Are brain vascular cells dysfunctional in MS?

Dr Alastair Fortune - Menzies Institute for Medical Research, University of Tasmania, TAS

This project explores whether pericytes, brain vascular cells that regulate blood flow and communicate with immune cells, play a role in the early stages of MS. Dr Alastair Fortune and his team will compare pericytes from people with and without MS to see if they behave differently, and how this might affect blood vessels, immune activity and disease progression. The findings could reveal new insights into how MS begins and help researchers explore new treatment options.

"Pericytes are often overlooked in MS research, but they may hold vital clues to how the disease starts and progresses," said Dr Fortune. "Understanding their role could open up new treatment options beyond the immune system."

Can wearable tech and apps help track MS symptoms more effectively?

Dr Laura Laslett - Menzies Institute for Medical Research, University of Tasmania, TAS

This project investigates whether smartwatches and the MySymptoMS app can effectively monitor sleep and symptoms in people with MS over extended periods. Dr Laura Laslett will assess whether these tools are practical, acceptable, and capable of capturing symptom changes that traditional methods often miss. The findings could inform the design of future clinical trials and support the development of more effective treatments for sleep problems in MS.

“Sleep disturbance is a major issue for many people with MS, but we still don’t have good enough ways to measure it,” said Dr Laslett. “This study is about getting the foundations right and making sure we’re using tools that work for the people living with the disease.”

Can immune cell messengers help repair myelin in MS?

Dr Monokesh Sen - The University of Sydney, NSW

This project investigates whether macrophage-derived extracellular vesicles (MEVs), tiny messengers released by immune cells, can support myelin repair in MS. Dr Monokesh Sen and his team will extract MEVs from blood samples, track their movement in the brain, and test their effects in models of myelin damage. The findings could open up new pathways for regenerating myelin and protecting nerve cells.

“Current treatments mostly target inflammation but don’t promote myelin repair,” said Dr Sen. “We’re investigating whether these vesicles could offer a new pathway to slow progression and improve outcomes for people with MS.”

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MEDIA ASSETS: In this [Dropbox folder](#), you will find broadcast-quality video grabs, research project summaries and images of key spokespeople.

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