

# Monash researchers lead the way in blood clotting discovery

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A Monash-led research team has discovered an entirely new mechanism that promotes blood clot formation - a major breakthrough that will impact on treatment and prevention of heart disease and stroke.

The discovery is today published in the prestigious [Nature Medicine](#) journal.

The discovery is the result of a decade-long research project led by Professor Shaun Jackson, Dr Warwick Nesbitt and Erik Westein from the Australian Centre for Blood Diseases (ACBD) at Monash University.

The study has discovered a new link between disturbed blood flow and blood clotting. ACBD research director Professor Shaun Jackson said that the association between disturbed blood flow and blood clotting was identified more than 150 years ago however it has proven extremely difficult to work out the mechanism by which blood flow activates the clotting mechanism.

"Changes in our arteries are a normal feature of the ageing process leading to disturbances in blood flow. Our work identifies the precise mechanism by which these blood flow changes activate the clotting process, increasing the risk of heart attack and stroke," Professor Jackson said.

Working in collaboration with scientists in the Department of Mechanical Engineering and the Division of Biological Engineering,

Monash University and the School of Electronics and Computer Engineering at RMIT University in Melbourne, the ACBD researchers developed sophisticated new techniques that have helped define the link between disturbed [blood flow](#) and clot formation.

Lead author Dr Nesbitt explains that this new clotting mechanism is not sensitive to anti-clotting drugs, such as aspirin, clopidogrel or warfarin, defining an important new mechanism responsible for anti-clotting drug resistance.

"This discovery may partly explain the lack of effectiveness of commonly used anti-clotting therapies and may also lead to the development of new and innovative approaches to prevent [heart disease](#) and stroke." Dr Nesbitt said.

Blood clotting diseases are Australia's major healthcare problem affecting more than 50 per cent the adult population and kills one Australian nearly every ten minutes. The development of a clot in the circulation to the heart or brain (causing a [heart attack](#) or stroke, respectively) is an enormous clinical problem, responsible for more deaths in the community than any other disease.

Despite intense investigation over the last 40 years into the discovery and development of more effective anti-clotting drugs, the impact of these therapies on mortality rates has remained disappointingly low, with less than one in six patients taking anti-clotting therapies avoiding a fatal clotting event.

Mr Westein, co-lead author of the study, said the situation was likely to worsen in the future due to the rapidly growing incidence of obesity and diabetes. "People with diabetes are typically more resistant to the benefits of anti-clotting therapy, thus there is a pressing need for the identification and development of more effective approaches in the

prevention of blood clotting," Mr Westein said.

Source: Monash University ([news](#) : [web](#))

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