

Australian researchers identify culprit molecule on MS immune cells

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Professor Shaun McColl

Researchers from the University of Adelaide have identified a key protein on the surface of cells that controls the immune attack in MS. The research focuses on the movement of immune cells into the brain and spinal cord in MS, the vital first stage before immune cells attack myelin.

Until now, it was thought that a molecule known as CCR6 on the surface of the immune cells controlled this movement.

This new research, published in the prestigious medical journal *Nature Communications*, has revealed a different molecule called CCR2 is responsible for the entry of the attacking immune cells into the brain and spinal cord at later chronic stages of disease. Whereas CCR6, on the other hand, is responsible for regulating other

immune cells at earlier stages of the disease, but does not seem to take part in the direct attack on myelin in the brain.

In an MS-like illness in laboratory models that mimics the ongoing long-term relapses of MS, blocking the CCR2 molecule on immune cells was the crucial step and this resulted in a reduction of relapse symptoms. They also showed that blocking CCR2 reduced the accumulation of attacking immune cells in the brain and spinal cord in the mice. The researchers went on to show that the attacking immune cells in people with MS do not have CCR6 on their surface, but they do have the CCR2 molecule, meaning that CCR2 is also important in the human disease.

The lead researcher, Ervin Kara, is a PhD student working with Professor Shaun McColl and Dr Iain Comerford from the Centre for Molecular Pathology, at the University of Adelaide. Professor McColl and Dr Comerford currently hold a project grant from MS Research Australia to investigate immune cell movement into the brain and spinal cord.

These exciting results have opened the door for new therapies to be designed using CCR2 as a target to block the movement of immune cells into the brain in people with MS. In discussing these new findings, Professor McColl said, 'If we can find an antagonist to block the CCR2 receptor specifically on these T-cells, we should be able to control the progression of MS'.