

Research fellow unlocking new ways to boost myelin repair

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Dr Jessica Fletcher, University of Melbourne.

The brain is able to repair the damage wrought by the immune system in the early stages of MS in a process known as remyelination. However, once a person enters the progressive stage of MS, this process does not work as well, and disability accumulates over time due, in part, to a lack of repair to the damaged myelin.

[Dr Jessica Fletcher](#) at the University of Melbourne was awarded a postdoctoral fellowship in 2015 with funding support from the [Trish MS Research Foundation](#), The Pierce Armstrong Foundation and the MS Angels which aimed to overcome this lack of repair by increasing myelin production in the brain.

Dr Fletcher's research concentrated on the brain derived neurotrophic factor (BDNF), a molecule known to be involved in myelin repair in the myelin-producing cells. BDNF works within a biological pathway and she specifically looked at other molecules involved in this pathway to see whether she can promote myelin repair. Now at the end of her first year Dr Fletcher has made substantial progress in achieving her aims.

Dr Fletcher has concentrated on the role of molecules which are switched on in response to activation of BDNF in myelin producing cells, known as Erk1/2. Dr Fletcher used animal models of an MS-like illness to show that activation of Erk1/2 was important for natural repair of myelin and further that increasing the signalling through the Erk1/2 pathway promoted the myelin repair. In a separate series of experiments, Dr Fletcher has also started to determine the underlying mechanisms used by Erk1/2 at a molecular level, to try to understand the way that myelin repair is regulated.

This work is important since identifying the way myelin is repaired at a cellular level will provide new targets for the treatment for progressive MS, to promote myelin repair, prevent nerve damage and halt MS disease progression in these cases. In a validation of the importance of her findings, Dr Fletcher has already presented her results at a number of national and international conferences with several more presentations planned for 2016. We await her formally published findings with great interest.