

Immune link to stress could help in treating depression

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Researchers at the University of Adelaide say a new focus on the links between the immune system and stress is needed to help pave the way for improved treatments of severe depression.

In a paper published in *Frontiers in Neuroscience*, a team based in the University's School of Medical Sciences argues that current treatments for [major depressive disorder](#) (MDD) lack effectiveness, pointing to other underlying causes of [depression](#) that have so far gone untreated.

The researchers have conducted a review of previous studies in the field and concluded that the protein best known for its role in immunology, called toll-like receptor 4 (TLR4), could be central to better understanding the disease.

"Current medications are insufficient to provide long-term relief from depression in most patients, and only one in seven patients shows any real benefit from the treatment," says co-author and PhD student in Physiology at the University of Adelaide, JiaJun ("JJ") Liu.

"Given the huge burden placed on individuals, families and society from depression, new insights into the condition – and new medications – are desperately needed."

Ms Liu says scientists have known for years that stress can lead to ill health, and [the immune system](#) has been increasingly associated with

various psychosomatic illnesses. "But stress has proven difficult to study because it's hard to pinpoint exactly what it does in the body," she says.

"With [major depression](#), patients also have changes in their immunology. We know that a decrease in depressive symptoms is associated with a normalisation of this immunology. So these changes taking place in the [immune system](#) are playing an important role in patients' disease."

Ms Liu's review of the literature examining the brain as an immune organ demonstrates a clear role for TLR4 and its control of hormones in the body, all contributing to extended periods of stress and eventually depression.

"The immune-brain-hormone systems are in constant communication. In the case of [stress](#) and MDD, all three systems may be dysfunctional in patients. The difficulty in finding targets for treatment lies in untangling these multi-layered relationships," she says.

"The direct relationship between TLR4 and depression is still not fully understood, although timing and location of TLR4 activation appears to be important. More research is needed to better understand this connection."

Provided by University of Adelaide

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