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Alcohol-related behavior changes -- blame your immune system

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When you think about your immune system, you probably think about it fighting off a cold. But new research from the University of Adelaide suggests that immune cells in your brain may contribute to how you respond to alcohol.

"It's amazing to think that despite 10,000 years of using alcohol, and several decades of investigation into the way that alcohol affects the nerve cells in our brain, we are still trying to figure out exactly how it works," says lead researcher Dr Mark Hutchinson from the University's School of Medical Sciences.

Although scientists know much about how alcohol affects nerve cells, there is also a growing body of evidence that alcohol triggers rapid changes in the immune system in the brain. This immune response lies behind some of the well-known alcohol-related behavioural changes, such as difficulty controlling the muscles involved in walking and talking.

In research published in the latest edition of the British Journal of Pharmacology, Dr Hutchinson's team gave a single shot of alcohol to laboratory mice and studied the effect of blocking Toll-like receptors, a particular element of the immune system, on the behavioural changes induced by alcohol. The researchers used drugs to block these receptors. They also studied the effects of giving alcohol to mice that had been genetically altered so that they were lacking the functions of selected receptors.

The results showed that blocking this part of the immune system, either with the drug or genetically, reduced the effects of alcohol. While the research was carried out on mice, Hutchinson's team believe that similar treatments could also work in humans.

"Medications targeting Toll-like receptor 4 may prove beneficial in treating alcohol dependence and acute overdoses," says Dr Hutchinson.

This work has significant implications for our understanding of the way alcohol affects us, as it is both an immunological and neuronal response. Such a shift in mindset has significant implications for identifying individuals who may have bad outcomes after consuming alcohol, and it could lead to a way of detecting people who are at greater risk of developing brain damage after long-term drinking.

Provided by Wiley

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