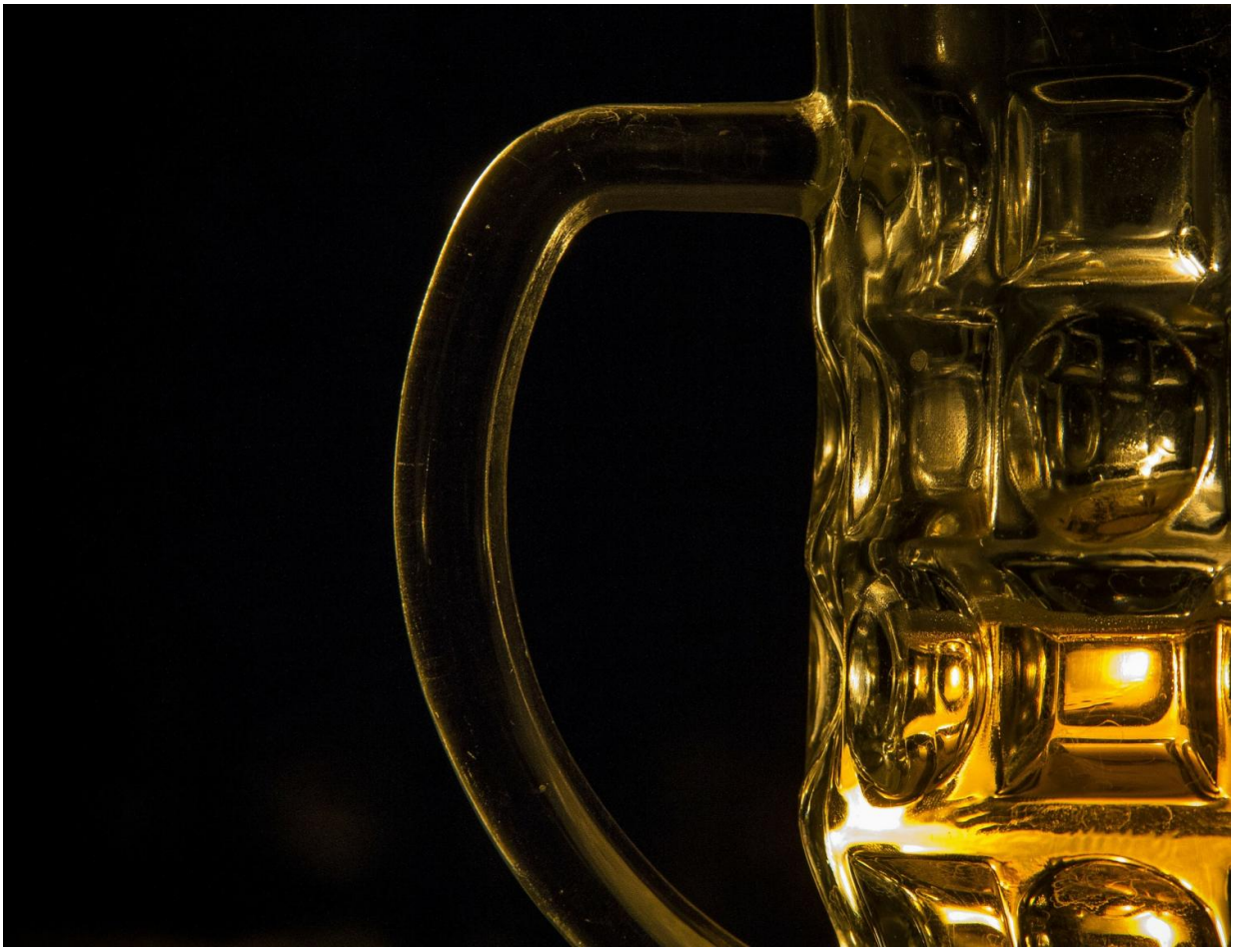
MedicalXpress

# Drug could block harmful impact of teen binge drinking, researchers report

November 2 2017, by David Ellis



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Alcohol-fueled "schoolies" celebrations marking the end of high school

for many Australian students have an unexpected impact: their binge-drinking behaviour as teenagers can lead to problems with alcohol and other drug dependence later on in life.

That's according to researchers from the University of Adelaide, who are making advances in an emerging field of research highlighting the importance of the brain's immune system in our desire to drink alcohol.

The Adelaide researchers have made a discovery that may eventually help to switch off binge-drinking behaviour in adults who used to binge during their adolescent years.

This research has been published in the journal *Neuropharmacology*.

"Adolescence is a vulnerable time during the brain's development – and that's something most teenagers won't be thinking about when they start their schoolies celebrations this month," says lead author Jon Jacobsen, PhD student in the University of Adelaide's Discipline of Pharmacology.

"During our teen years, the brain is still in a relatively immature state. Binge drinking worsens this situation, as alcohol undermines the normal developmental processes that affect how our brain matures.

"Therefore, when an adolescent who has been binge drinking becomes an adult, they're often left with an immature brain, which assists in the development of alcohol dependence," Mr Jacobsen says.

In their laboratory studies, researchers observed that adolescent mice involved in binge drinking behaviour developed an increased sensitivity to alcohol as adults and engaged in further binge drinking.

"Even a small amount of alcohol during adolescence can alter the way

mice respond to alcohol later on in life, suggesting any amount of alcohol is potentially detrimental to normal brain development," Mr Jacobsen says.

The researchers were able to prevent some of these detrimental behaviors observed in adulthood, by giving mice a drug that blocks a specific response from the immune system in the brain.

The drug is (+)-Naltrexone (pronounced: PLUS-NAL-TREX-OWN), which is known to block the immune receptor Toll-like receptor 4 (TLR4).

"This drug effectively switched off the impulse in mice to binge drink," says senior author Professor Mark Hutchinson, Director of the ARC Centre of Excellence for Nanoscale BioPhotonics at the University of Adelaide and leader of the Neuroimmunopharmacology lab in which this work was conducted.

"The mice given this drug still sought out alcohol, but their level of drinking was greatly reduced."

Professor Hutchinson says this research is among the first of its kind to show a link between the brain's immune system and later-life problems caused by binge drinking during adolescence.

"We're excited by the finding that we can potentially block binge drinking in an adult after they have experienced such behaviour during adolescence, by stopping the activation of the brain's immune system. It's the first time this has been shown, and gives us hope that our work has implications for the eventual treatment of alcohol addiction in adults," Professor Hutchinson says.

**More information:** Jonathan Henry Jacobsen et al. Antagonising

TLR4-TRIF signalling before or after a low-dose alcohol binge during adolescence prevents alcohol drinking but not seeking behaviour in adulthood, *Neuropharmacology* (2017). DOI: 10.1016/j.neuropharm.2017.09.028

Provided by University of Adelaide