

# Drug shown to reverse brain deficits caused by alcohol

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Credit: Queensland University of Technology

QUT researchers have identified a drug that could potentially help our brains reboot and reverse the damaging impacts of heavy alcohol consumption on regeneration of brain cells.

Their studies in adult mice show that two weeks of daily treatment with the drug tandospirone reversed the effects of 15 weeks of binge-like

alcohol consumption on neurogenesis – the ability of the [brain](#) to grow and replace neurons (brain cells). The findings have been published in *Scientific Reports*.

- This is the first time tandospirone has been shown to reverse the deficit in brain neurogenesis induced by heavy alcohol consumption
- Tandospirone acts selectively on a serotonin receptor (5-HT1A)
- The researchers also showed in mice that the drug was effective in stopping anxiety-like behaviours associated with [alcohol withdrawal](#), and this was accompanied by a significant decrease in binge-like alcohol intake

"This is a novel discovery that tandospirone can reverse the deficit in neurogenesis caused by alcohol," said study leader neuroscientist Professor Selena Bartlett from QUT's Institute of Health and Biomedical Innovation.

"We know that with heavy drinking you are inhibiting your ability to grow new neurons, [brain cells](#). Alcohol is specifically very damaging for neurons.

"Other studies in mice have shown that tandospirone improves brain neurogenesis, but this is the first time it has been shown that it can totally reverse the neurogenic deficits induced by alcohol.

"This opens the way to look at if neurogenesis is associated with other substance-abuse deficits, such as in memory and learning, and whether this compound can reverse these."

Professor Bartlett, who is based at the Translational Research Institute, said the discovery by study co-authors QUT postdoctoral research fellows Dr. Arnauld Belmer and Dr. Omkar Patkar came about

serendipitously, after research started in a different direction.

"It was surprising, and exciting," Dr. Belmer said. "This drug is relatively new and available only in China and Japan. It is commonly used there and shown to be highly effective in treating general anxiety and well tolerated with limited adverse effects."

Professor Bartlett said researchers are constantly looking at new treatment strategies for [alcohol abuse](#) and addiction, which is characterised by extended periods of heavy alcohol use, binges and abstinence, and anxiety and depression which contribute to relapse.

"This is not just another [drug](#) that shows promise in helping to reduce binge drinking," she said.

"While it could possibly have that effect, it might be able to help reboot the brain and reverse the deficits the alcohol abuse causes – both the inhibition to the brain's ability to regenerate, and the behavioural consequences that come from what [alcohol](#) is doing to the brain, like increases in anxiety and depression."

**More information:** Arnauld Belmer et al. 5-HT1A receptor-dependent modulation of emotional and neurogenic deficits elicited by prolonged consumption of alcohol, *Scientific Reports* (2018). [DOI: 10.1038/s41598-018-20504-z](#)

Provided by Queensland University of Technology

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