

New study shows how a single binge drinking episode affects gene that regulates sleep

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Mahesh Thakkar, Phd, professor and director of research at the MU School of Medicine appears with co-author Pradeep K. Sahota, MD, chair of neurology at the MU School of Medicine Credit: MU Health Care

One in six U.S. adults binge drinks at least four times a month, according to the Centers for Disease Control and Prevention. Previous studies have linked binge drinking to sleep disruption. Now, new findings from the University of Missouri School of Medicine explain how a single episode of binge drinking can affect the gene that regulates sleep, leading to sleep disruption in mice. The finding may shed light on how sleep problems can contribute to alcoholism in humans.

"Sleep is a serious problem for alcoholics," said Mahesh Thakkar, Ph.D., professor and director of research in the MU School of Medicine's Department of Neurology and lead author of the study. "If you binge drink, the second day you will feel sleep deprived and will need to drink even more alcohol to go to sleep. It is a dangerous cycle. How can we stop this cycle or prevent it before it begins? To answer that question, we

need to understand the mechanisms involved."

Using a mouse model, Thakkar monitored the effect of [binge drinking](#) on [sleep patterns](#). Thakkar found mice exposed to binge drinking experienced a significant increase in non-rapid eye movement sleep four hours post-binge, followed by increased wakefulness and reduced sleep during subsequent sleep periods. Thakkar also discovered post-binge mice did not experience an increase in a sleep promoting chemical, adenosine, in the brain nor increased sleep pressure during [sleep deprivation](#). The research also revealed binge alcohol consumption affects the gene that regulates sleep, resulting in [sleep disturbances](#).

"What we have shown in this research is that a particular gene—which is very important for sleep homeostasis—is altered by just one session of binge drinking," Thakkar said. "We were not expecting this. We thought it would be affected after multiple sessions of binge drinking, not one. That tells you that as soon as you consume four drinks, it can alter your genes."

Provided by University of Missouri-Columbia

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