UCLA brain scientists crack mystery of how alcohol causes intoxication

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Natural gene mutation heightens sensitivity, may offer new drug target

Alcohol interferes with how brain cells communicate with one another, coordination, grogginess, impaired memory and loss of inhibitions associated with drunkenness. Yet researchers have been unable to pinpoint how alcohol causes this disruption in the brain.

Now scientists at the David Geffen School of Medicine at UCLA have deciphered how a naturally occurring gene mutation in rats' brains lowers the animals' tolerance to alcohol, leading to rapid and acute intoxication after the equivalent of one drink. The UCLA study is the first to identify how the gene variation alters GABA receptors -- specific sites targeted by chemicals from the brain cells -- making them more responsive to very low levels of alcohol. Alcohol enhances the GABA receptors' influence on brain cells, slowing the cells' activity and ability to communicate.

The fact that the gene mutation arises naturally suggests that tolerance levels to alcohol may be genetically wired in people, too. If so, the findings could eventually help identify children and adults at higher risk of developing alcohol dependency, so these individuals can make an informed decision about whether to drink. The study results may also speed the development of new drugs that target alcohol-sensitive GABA receptors, leading to better treatments for alcohol poisoning and addiction.

The Feb. 6 online edition of Nature Neuroscience reports the findings.

Source: University of California - Los Angeles