Protein in the brain can 'put the brakes' on binge drinking

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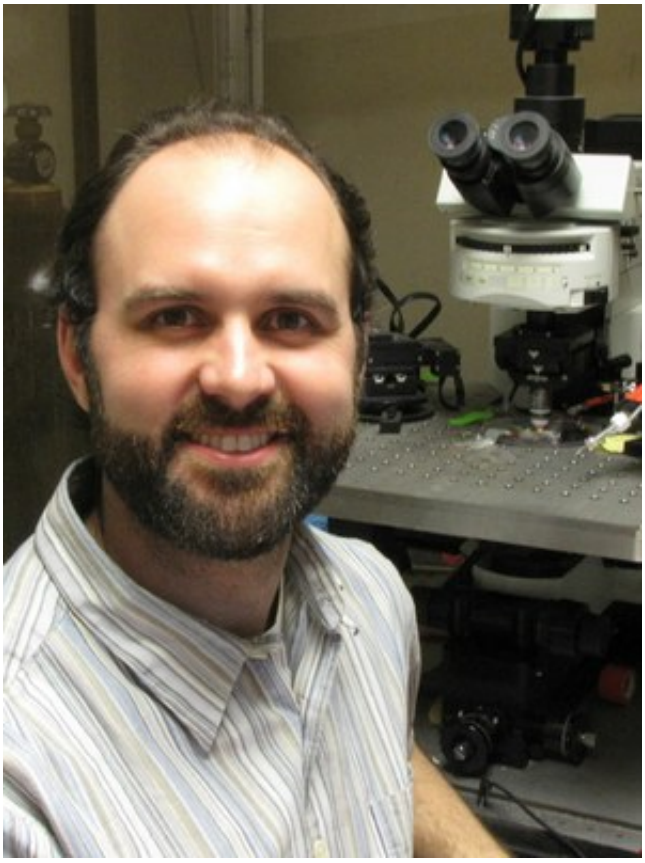

The study was led by Thomas L. Kash, PhD, assistant professor in the departments of pharmacology and psychology at the University of North Carolina at Chapel Hill and a member of UNC's Bowles Center for Alcohol Studies. Credit: UNC School of Medicine

A new study led by University of North Carolina School of Medicine

researchers has found that a naturally-occurring protein in the brain can act to suppress binge alcohol drinking, a major public health problem estimated to cost the U.S. more than $170 billion each year.

The study, published online by the journal *Nature Neuroscience* on March 9, was led by Thomas L. Kash, PhD, assistant professor in the departments of pharmacology and psychology and a member of UNC's Bowles Center for Alcohol Studies.

"Using a series of genetic and pharmacological approaches we identified how a compound in the brain, Neuropeptide Y (NPY), can suppress this dangerous behavior," Kash said.

"Specifically, we found that NPY acted in a part of the brain known as the extended amygdala (or bed nucleus of the stria terminalis) that we know is linked to both stress and reward. This anti-drinking effect was due to increasing inhibition (the brakes) on a specific population of cells that produce a 'pro-drinking' molecule called corticotropin releasing factor (CRF). When we then mimicked the actions of NPY using engineered proteins, we were also able to suppress binge alcohol drinking in mice.

"Finally, we found that this anti-drinking NPY system is altered by long-term alcohol drinking in multiple species, suggesting that this may be either a marker or treatment for alcohol abuse," Kash said.

"The identification of where in the brain and how NPY blunts binge drinking, and the observation that the NPY system is compromised during early binge drinking prior to the transition to dependence, are novel and important observations," said study co-author Todd E. Thiele, PhD, professor of psychology at UNC and a member of the Bowles Center for Alcohol Studies. "What is particularly exciting is that these findings suggest that restoring NPY may not only be useful for treating

alcohol use disorders, but may also protect some individuals from becoming alcohol dependent," said Thiele.

More information: NPY signaling inhibits extended amygdala CRF neurons to suppress binge alcohol drinking, DOI: 10.1038/nn.3972

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