

Study identifies gene for alcohol preference in rats

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(Medical Xpress)—Selectively bred strains of laboratory rats that either prefer or avoid alcohol have been a mainstay of alcohol research for decades. So-called alcohol-preferring rats voluntarily consume much greater amounts of alcohol than do non-preferring rats. Scientists at the National Institutes of Health now report that a specific gene plays an important role in the alcohol-consuming tendencies of both types of rats.

"This study advances our understanding of the genetics and neurobiology of [alcohol](#) consumption in an important animal model of human alcoholism," says Kenneth R. Warren, Ph.D., acting director of the National Institute on Alcohol Abuse and Alcoholism (NIAAA), part of NIH.

As reported online in the *Proceedings of the National Academy of Sciences*, a diverse team of scientists, led by David Goldman, M.D., chief of NIAAA's Laboratory of Neurogenetics, used exome sequencing, an approach that comprehensively analyzes the DNA that encodes proteins. They found a severely dysfunctional form of the gene for a brain signaling molecule called metabotropic glutamate receptor 2 (Grm2), known as a stop codon, in alcohol-preferring rats but not in non-preferring rats. The researchers then demonstrated that drugs and genetic changes that block Grm2 increased [alcohol consumption](#) in normal [rats](#) and mice.

"We've long known that genes play an important role in alcoholism," says Dr. Goldman. "However, the genes and genetic variants that cause

alcoholism have remained largely unknown. This first discovery of a gene accounting for alcohol preference in a mammalian model illustrates that genomic analysis of a model organism is a powerful approach for a complex disease such as alcoholism."

The researchers say that using genomic techniques to detect genetic variants in selected strains such as the alcohol preferring rat could be an attractive strategy for identifying candidate drug targets to treat people with alcohol problems.

Dr. Goldman and Dr. Warren noted the pioneering work of former NIAAA director Ting-Kai Li, M.D., who developed and validated the alcohol-preferring / non-preferring rat model of alcoholism with colleagues at the Alcohol Research Center at the Indiana University School of Medicine, Indianapolis, before coming to NIAAA in 2002. Since stepping down as NIAAA director in 2008, Dr. Li has been a professor of psychiatry and behavioral sciences at Duke University School of Medicine in Durham, N.C.

"I commend Dr. Goldman and his NIAAA colleagues on this important study," said Dr. Li. "It is gratifying to see that the alcohol-preferring/non-preferring model continues to provide a foundation for advancing the search for solutions to alcohol problems."

More information: Loss of metabotropic glutamate receptor 2 escalates alcohol consumption,

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