

Researchers uncover gene's role in severity of drinking

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New research from the University of Virginia Health System could help explain why some alcoholics are more severe drinkers than others. A UVA team has found strong evidence that the serotonin transporter gene, SLC6A4, plays a significant role in influencing drinking intensity among alcohol-dependent individuals.

The study, published in the February 2009 issue of *Alcoholism: Clinical & Experimental Research*, analyzed the associations between six different DNA sequence variations, or single nucleotide polymorphisms, of the serotonin transporter gene with the levels of drinking intensity among 275 alcohol-dependent individuals seeking treatment. Drinking intensity is measured by the amount a person consumes each day he or she drinks.

"Of the six variants examined in the study, we found that one variant at the 3' end of the gene showed a significant association with drinking intensity," says study co-author Ming D. Li, Ph.D., professor of psychiatry and neurobehavioral sciences in the UVA School of Medicine. "Specifically, we found that individuals with the 'G' allele of this variant drink less than individuals with the 'T' allele."

Previous studies have shown that the neurochemical serotonin mediates the rewarding effects of alcohol and, therefore, may be a key contributor leading to alcohol abuse. Studies also show that the brain's serotonin system plays an important role in alcohol preference and consumption.

"Acute drinking increases serotonin release and signaling in brain



regions involved in controlling consumption of alcohol," explains study co-author Professor Bankole Johnson, D.Sc., M.D., Ph.D., M.Phil., FRCPsych., chairman of the Department of Psychiatry and Neurobehavioral Sciences in the UVA School of Medicine. "But chronic drinking reduces serotonergic function, leading to a serotonin-deficient state. One hypothesis is that alcoholics drink to alleviate this serotonindeficient state.

"But it's important to remember that alcoholics differ significantly in their drinking patterns, social backgrounds and disease etiology," says Johnson. "All of these factors may affect both treatment outcomes and medical complications resulting from heavy drinking."

One of the main goals of treatment, Johnson points out, is to reduce the intensity of drinking. "A known genetic marker could be used to sub-type alcoholics and better determine treatment methods that can target specific underlying molecular mechanisms. We hope to determine whether this particular genetic variant can be used as a marker to predict treatment outcomes for different serotonin agents," says Johnson.

Source: University of Virginia

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