

Environmental factors can mitigate genetic risk for developing alcohol problems

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Alcohol use during adolescence is harmful on multiple levels, including an increased risk for developing alcohol use disorders (AUDs) later in life. Recent research suggests that genetic influences are moderated by environmental factors. A new study of gene-environment interactions between a functional single nucleotide polymorphism (SNP) of the μ -opioid receptor (OPRM1) gene (A118G) and the risk for developing an AUD during adolescence, with a specific focus on the influence of parenting practices or affiliation with deviant peers, has confirmed that environmental factors can moderate this association.

Results will be published in the February 2013 issue of *Alcoholism: Clinical & Experimental Research* and are currently available at Early View.

"The harmful effects of underage drinking are well documented," said Robert Miranda, associate professor in the department of psychiatry and human behavior at Brown University and corresponding author for the study. "They include injury-related death, suicide, victimization, academic failure and dropout, and possibly irreversible damage to the developing brain."

"Consuming alcohol during adolescence confers different health risks, some are similar to adults, others have particular significance for this stage of human development," said John F. Kelly, associate professor in psychiatry at Harvard Medical School, and associate director of Massachusetts General Hospital-Harvard Center for Addiction

Medicine. "Alcohol harms can be caused directly, for instance by the action of alcohol on the body such as drinking a large amount resulting in overdose death, or indirectly, through psychological impairments associated with acute intoxication that lead to accidental injury such as car accidents, falls, drowning and so on. Because [adolescents](#) are typically inexperienced regarding the effects of alcohol, they are more likely to run into these kinds of problems. Furthermore, early exposure to alcohol during this developmental phase can dramatically influence the chances that someone will develop an alcohol use disorder."

"This [SNP](#) of the μ -[opioid receptor](#) (OPRM1) gene has received considerable attention among alcohol researchers over the past decade," said Miranda. "A number of adult studies suggest persons with a certain variant of this gene experience alcohol as more rewarding and show heightened risk for developing alcohol-related problems. We were interested in extending this work to adolescents."

The researchers recruited adolescents from the community via flyers and informational booths stationed at local recreational settings such as malls as well as high schools, leading to 104 adolescents with European ancestry (53 males, 51 females), ages 12-19 years. All participants were interviewed to ascertain AUD diagnoses, provided a DNA sample for genetic analyses, and completed measures of parental monitoring and deviant peer affiliation.

"The key finding of this study is that while genetics appear to play a role in the development of alcohol problems among teenagers, environmental factors can considerably reduce this risk," said Miranda. "The implication is that risk for the developing alcohol addiction is complex and involves interplay between genetic and [environmental factors](#). It is important for future research to more fully elucidate the nature of this relationship and to develop intervention and prevention strategies that are personalized to the individual based on his or her unique liability and

clinical profile."

Kelly agreed. "These findings add to a growing body of work that suggests genes are not destiny; rather, there are many things that we can do in the environment to offset genetic risk," he said. "This research has crucial social and public health implications because it addresses the intriguing issue of how something that we do have control over – our environment – can influence something that we do not have control over – our genes. Importantly, this study suggests there are things that parents can do, like monitoring their child's social behavior more closely, and thus reduce risk for the development of a potentially devastating disorder."

"It is well-known that [parenting practices](#) and affiliation with deviant peers influence the risk of developing problems with alcohol during adolescence," said Miranda. "This study further highlights the importance of these malleable factors by showing greater parental monitoring and less affiliation with deviant [peers](#) can reduce genetic risk for developing alcohol use disorders."

"If you are a parent, pay closer attention to your child's whereabouts, and with whom your kids are affiliating socially, both of which can pay enormous dividends in reducing problems," added Kelly. "Beginning an open and ongoing conversation with your child along these lines, including discussing the nature of [alcohol](#)-specific risks, could eradicate a potentially devastating problem."

Provided by Alcoholism: Clinical & Experimental Research

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