

Critical genetic link found between human taste differences and nicotine dependence

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Could an aversion to bitter substances or an overall heightened sense of taste help protect some people from becoming addicted to nicotine? That's what researchers at UVA have found using an innovative new method they've developed to analyze the interactions of multiple genetic and environmental factors. Their findings one day may be key in identifying people at risk for nicotine dependence.

In a study published in the October 10, 2008 issue of *The American Journal of Human Genetics*, University of Virginia Health System researchers report that two interacting genes related to bitter taste sensitivity, TAS2R16 and TAS2R38, play an important role in a person's development of nicotine dependence and smoking behavior. Researchers found that people with higher taste sensitivity aren't as likely to become dependant on nicotine as people with decreased taste sensitivity.

"This new knowledge is an important tool in predicting whether a person is likely to become a smoker or not," says lead investigator Ming Li, Ph.D., professor of psychiatry and behavioral neurosciences who specializes in addiction and genetics research.

It's long been known that a person's ability to taste bitter substances plays a crucial role in the rejection of potentially toxic foods, but taste sensitivity varies widely among individuals and between ethnic groups. Previous studies have suggested a link between so-called taster status and nicotine dependence, but genetic evidence underlying such a link has been lacking.

"Until now, the method for analyzing gene to gene or gene to environment interactions could only handle one type of trait without correcting for other important covariants, such as age or gender, but we've developed a novel algorithm and corresponding computer program that can handle all types of genetic data and correct for any number of variants – gender, age, race, and so on," explains Dr. Li, who with his team studied genetic data of more than 2,000 participants from more than 600 families of African American or European American origin.

"This new approach significantly expands our ability to study gene-gene or gene-environmental interactions. It provides a far better analytical tool for every scientist out there doing genetics work," says Dr. Li.

"We're laying an important foundation for addressing nicotine dependence. First we need to establish a comprehensive understanding of how all associated genes work together to affect smoking behaviors and addiction; that's what we're doing now. Once we have that base of knowledge, we can move on to develop effective prevention and treatment for nicotine dependence."

Source: University of Virginia

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