

UW-CTRI News Release

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Taste gene may play role in smoking

Recent research on the genetics of smoking has focused on genes that are thought to be related to nicotine metabolism, personality traits, and regulation of emotions. According to a genetic study just published in *Nicotine and Tobacco Research*, genes responsible for taste also may yield important information about who smokes and why they smoke.

Researchers from the Universities of Utah and Wisconsin wanted to determine if a “bitterness” gene—phenylthiocarbamide (PTC)—was related to smoking status and how important the taste of cigarettes is to a smoker. As predicted, those smokers who possessed less sensitivity to bitter taste were more likely to rate taste as a strong reason for smoking, and those who were sensitive to bitter taste were less likely to smoke for taste. A surprising result, which must be replicated for scientific accuracy, was the discovery that smokers with a different, less common genetic variant for taste were the least likely to smoke.

“Nicotine dependence is likely to be the result of many genes and complex environmental effects,” said Dale Cannon, Ph.D., University of Utah, lead author of the study. “What this study tells us is that genetic factors involving the taste of cigarettes should be examined as part of the analysis of nicotine dependence.”

Included in the study, conducted in Milwaukee, Wis., by the University of Wisconsin, were 384 smokers enrolled in a smoking cessation study and 183 controls recruited to donate blood samples. Researchers from the University of Utah examined the blood samples collected from these participants for the PTC gene’s two most common

sets of alleles—PAV and AVI, named for the amino acids at their three genetic-pair locations. People with only PAV are most sensitive to bitter taste, while those with only AVI are less sensitive. AVI “non-tasters” were more likely than the PAV “tasters” to smoke for the taste of cigarettes. A third group, people with the less common “intermediate taster” type (AAV), were the least likely to smoke—20 percent less likely.

Researchers used the WISDM-68 (the Wisconsin Index of Smoking Dependence Motives), to compare taste ratings with genetic analyses. “We found a significant difference in the motivation to smoke for the taste of cigarettes between those who perceived bitter taste and those who didn’t,” said Timothy Baker, Ph.D., University of Wisconsin, one of the study’s authors. “We also found the ratings of ‘cues’ (sights and smells that trigger urges to smoke) higher among those who were not bitter-tasters.”

What researchers did not find is any gender differences in tasting bitterness and smoking. Further research is planned into genetic influences on smoking.

The University of Wisconsin Transdisciplinary Tobacco Use Research Center (TTURC) is one of seven centers funded by the National Cancer Institute and the National Institute on Drug Abuse to investigate new ways of combating tobacco use and nicotine addiction, using an innovative, integrated approach.

Cannon, D.S., Baker, T.B, Piper, M.E., Scholand, M.B., Lawrence, D.L., Drayna, D.T., McMahon, W.M., Villegas, B.M., Caton, T.C., Coon, H., Leppert, M.F. Associations between phenylthiocarbamide gene polymorphisms and cigarette smoking. *Nicotine & Tobacco Research*, (2005) 7, 853-858.