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## **NIH Scientists Demonstrate Genetic Variant is Linked to Greater Effectiveness of Smoking Cessation Medication**

*Finding Is a Step toward Personalized Approach to Treatment*

A genetic variant present in nearly half of Americans of European ancestry is linked to greater effectiveness of the smoking cessation medication bupropion (Zyban), according to research by scientists supported by the National Institute on Drug Abuse (NIDA) and the National Cancer Institute (NCI), part of the National Institutes of Health (NIH). People with this variant were less likely than those without it to have resumed smoking six months after treatment with bupropion.

The study, published in the September issue of the journal *Biological Psychiatry*, is a step toward the goal of being able to tailor smoking cessation treatment to individuals based on their unique genetic make-up.

"This study is part of our ongoing commitment to develop more accurate and personalized approaches to medicine," said NIH Director Dr. Elias A. Zerhouni. "This kind of genetic research is helping us to better understand why some people respond to certain smoking cessation treatments, and others don't."

The study involved more than 300 smokers who had been randomly assigned to treatment with either bupropion or a placebo (sugar pill) for 10 weeks. Participants were genetically tested for the presence of a variant form of the *CYP2B6* gene. The study was co-led by Dr. Rachel F. Tyndale of the Center for Addiction and Mental Health at the University of Toronto, Canada, and Dr. Caryn Lerman of the Transdisciplinary Tobacco Use Research Center at the University of Pennsylvania (TTURC) in Philadelphia.

“After 10 weeks of treatment, participants with this variant had significantly better quit rates on bupropion than on placebo, whereas those without it did equally well on both placebo and bupropion,” says Dr. Tyndale. “Additionally, among all participants who took bupropion, those with this variant were less likely than those without it to have resumed smoking at the six month follow-up.”

“This is another step towards improving the success rates of smoking cessation programs,” says NIDA Director Dr. Nora D. Volkow. “We are that much closer to being able to choose the treatment that will most benefit the individual patient, based on their genetic make-up.”

Previous studies have shown that about 45 percent of Americans of European ancestry have this variant form of the *CYP2B6* gene. This variant is also found in about 50 percent of African Americans and 25 percent of Asian Americans. The current study looked only at people of European ancestry, but the author and her colleagues have begun a similar study in African American smokers. They hypothesize that this variant of the *CYP2B6* gene will influence the effectiveness of bupropion treatment in the same way in African Americans as in those of European descent.

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The National Institute on Drug Abuse is a component of the National Institutes of Health, U.S. Department of Health and Human Services. NIDA supports most of the world’s research on the health aspects of drug abuse and addiction. The Institute carries out a large variety of programs to inform policy and improve practice. Fact sheets on the health effects of drugs of abuse and information on NIDA research and other activities can be found on the NIDA home page at [www.drugabuse.gov](http://www.drugabuse.gov).

For more information about cancer, please visit the NCI Web site at <http://www.cancer.gov> or call NCI’s Cancer Information Service at 1-800-4-CANCER (1-800-422-6237).

The National Institute on Alcohol Abuse and Alcoholism, part of the National Institutes of Health, is the primary U.S. agency for conducting and supporting research on the causes, consequences, prevention, and treatment of alcohol abuse, alcoholism, and alcohol problems and disseminates research findings to general, professional, and academic audiences. Additional alcohol research information and publications are available at [www.niaaa.nih.gov](http://www.niaaa.nih.gov).

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