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Odds of quitting smoking affected by genetics

*NIH-funded research shows genetics can predict success of smoking cessation
and need for medications*

Genetics can help determine whether a person is likely to quit smoking on his or her own or need medication to improve the chances of success, according to research published in today's American Journal of Psychiatry. Researchers say the study moves health care providers a step closer to one day providing more individualized treatment plans to help patients quit smoking.

The study was supported by multiple components of the National Institutes of Health, including the [National Institute on Drug Abuse](#) (NIDA), the [National Human Genome Research Institute](#), the [National Cancer Institute](#), and the Clinical and Translational Science Awards program, administered by the [National Center for Advancing Translational Sciences](#).

“This study builds on our knowledge of genetic vulnerability to nicotine dependence, and will help us tailor smoking cessation strategies accordingly,” said NIDA Director Nora D. Volkow, M.D. “It also highlights the potential value of genetic screening in helping to identify individuals early on and reduce their risk for tobacco addiction and its related negative health consequences.”

Researchers focused on specific variations in a cluster of nicotinic receptor genes, CHRNA5-CHRNB4, which prior studies have shown contribute to nicotine dependence and heavy smoking. Using data obtained from a previous study supported by the [National Heart Lung and Blood Institute](#), researchers showed that individuals carrying the high-risk form of this gene cluster reported a 2-year delay in the median quit age compared to those with the low-risk genes. This delay was attributable to a pattern of heavier smoking among those with the high risk gene cluster. The researchers then conducted a clinical trial, which confirmed that persons with the high-risk genes were more likely to fail in their quit attempts compared to those with the low-risk genes when treated with placebo. However, medications approved for nicotine cessation (such as nicotine replacement therapies or bupropion) increased the likelihood of abstinence in the high risk groups. Those with the highest risk had a three-fold increase in their odds of being abstinent at the end of active treatment compared to placebo, indicating that these medications may be particularly beneficial for this population.

“We found that the effects of smoking cessation medications depend on a person's genes,” said first author Li-Shiun Chen, M.D., of the Washington University School of Medicine, St. Louis. “If smokers have the risk genes, they don't quit easily on their own and will benefit greatly from the medications. If smokers don't have the risk genes, they are likely to quit successfully without the help of medications such as nicotine replacement or bupropion.”

According to the [Centers for Disease Control and Prevention](#), tobacco use is the single most preventable cause of disease, disability, and death in the United States. Smoking or exposure to secondhand smoke results in more than 440,000 preventable deaths each year -- about 1 in 5 U.S. deaths overall. Another 8.6 million live with a serious illness caused by smoking. Despite these well-documented health costs, over 46 million U.S. adults continue to smoke cigarettes.

The study can be found at: <http://ajp.psychiatryonline.org/article.aspx?articleID=1169679>. For information on tobacco addiction, go to: www.drugabuse.gov/drugs-abuse/tobacco-addiction-nicotine. For more information on tools and resources to help quit smoking, go to: www.smokefree.gov/.

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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, which is now compatible with your smartphone, iPad or tablet. To order publications in English or Spanish, call NIDA's DrugPubs research dissemination center at 1-877-NIDA-NIH or 240-645-0228 (TDD) or fax or email requests to 240-645-0227 or drugpubs@nida.nih.gov. Online ordering is available at <http://drugpubs.drugabuse.gov>. NIDA's media guide can be found at <http://drugabuse.gov/mediaguide/>, and its new easy-to-read website can be found at www.easyread.drugabuse.gov.

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