

Different genes influence smoking risk during adolescence and adulthood

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There is growing evidence that the risk factors for addiction change throughout the lifespan.

The risk factors for developing addiction in adolescence are the most intensively studied because this life phase is associated with the highest addiction risk. Traits linked to addiction risk during adolescence include pleasure-seeking, behavioral disinhibition, and devaluation of the future negative consequences of behavior. In contrast, the development of substance use among adults is more commonly associated with high levels of stress, anxiety, and depression.

Thus, perhaps it is not surprising that different sets of [genes](#) are now implicated in the risk for addiction in adolescence and adulthood.

In a new study published in [Biological Psychiatry](#), researchers found that teenagers carrying variants in two gene regions were three times more likely to become regular [smokers](#) in adolescence and twice as likely to be persistent smokers in adulthood, compared to non-carriers.

Variation in a set of dopamine-related genes was associated with a person's risk of starting smoking, and these genes had a stronger impact on smoking initiation in adolescents than in adults. Individuals carrying the risk variants had a 1.3-fold increased risk of starting smoking in their teenage years.

The other set of genes coded for subunits of the nicotinic cholinergic receptors, the brain targets for nicotine inhaled during smoking. Variation in these genes influenced the likelihood of smokers continuing the habit into adulthood, as it had a stronger influence on the smoking habits of adults than of adolescents. Those carrying these variants had a 1.3-fold increased risk of becoming a heavy and persistent smoker in adulthood.

"These findings seem to make some sense. The

dopamine-related genes may be more closely associated with the risk for addiction within the context of thrill-seeking, while cholinergic receptors, which have been implicated in mood and cognition as well as addiction, might contribute to self-medication models of addiction," commented Dr. John Krystal, Editor of *Biological Psychiatry*.

The researchers say the findings could help develop genetic testing for those wishing to know their susceptibility to nicotine dependence and tobacco-related disease. It could also pave the way for targeted drugs that influence an individual's response to [nicotine](#). However, further research is necessary before these goals could be implemented.

More information: "TTC12-ANKK1-DRD2 and CHRNA5-CHRNA3-CHRNA4 Influence Different Pathways Leading to Smoking Behavior from Adolescence to Mid-Adulthood" by Francesca Ducci et al. The article appears in *Biological Psychiatry*, Volume 69, Number 7 (April 1, 2011)

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