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Study Claims Nicotine Causes Cancer

Injecting mice for two years with levels of nicotine sufficient to cause hair loss caused 78 percent to develop cancer.

by [John R. Polito](#)

Does nicotine cause cancer? As if those addicted to nicotine really need another reason to quit, authors of a new study of mice claim that nicotine is in fact a carcinogen.

"We demonstrated for the first time that chronic treatment of A/J mice with an LD50 dose of nicotine cause carcinogenic transformation of both smooth and striated muscles as well as transient hair loss," wrote University of California Irvine researchers in their new study published online at Life Sciences. [1]

"Our results, therefore, should add nicotine to the [list](#) of potential carcinogens present in tobacco products and raise concern about the safety of long term usage of nicotine replacement products."

Fifteen mice were injected with 3 milligrams of nicotine per kilogram of body weight, 5 days per week for 24 months. Five other mice served as controls and were injected with saline.

One mouse died of nicotine toxicity before treatment was complete. Eleven of the surviving 14 nicotine treated mice developed cancer tumors originating in either the uterus or skeletal muscle. None of the control mice developed tumors.

But Professor Andre Castonguay of the University of Laval in Quebec isn't convinced. Professor Castonguay notes that the nicotine molecule's chemical structure doesn't suggest a carcinogen, there were no lung tumors as would be expected, and two of the chemicals



Nicotine induced cancer tumor in a mouse. Galitovskiy V, et al, Life Sciences (2012).

nicotine breaks down into (its metabolites) are already known to cause cancer, NNN and NNK.

"Even if nicotine was nitrosated in vivo to NNN and NNK, one could not say that nicotine is carcinogenic. Nicotine would be a precursor to a carcinogenic metabolite or a procarcinogen," asserts Professor Castonguay.

"Previous studies have suggested that nicotine would be a promoter or enhancer of tumor development. The chemical structure of nicotine would be more consistent with this activity than with a carcinogenic activity."

Researchers in the study also noticed that nicotine treated mice started losing hair after 8-9 months of treatment. The number of hair follicles in affected areas declined by an average of roughly 30 percent.

Online, long-term nicotine gum chewers, both male and female, have long complained of significant hair loss.[2] Is hair loss reversible once nicotine use ends? "It regrew in our experimental mice," states Professor Sergei A. Grando, a physician and the study's senior author.



Like the caged canary in the mineshaft, might hair loss be a warning sign that blood nicotine levels are dangerously high? "Maybe," says Dr. Grando.

And what advice would Dr. Grando give to those hooked on smoked nicotine, smokeless nicotine, replacement nicotine or e-cigarette nicotine? "I had smoked for 25 years and then quit cold turkey. It is possible!"

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[2] Polito JR [Long-term Nicorette gum users losing hair and teeth](#), WhyQuit, December 1, 2008

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