

Genes, brain chemistry may dictate nicotine cravings, study says

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Individual brain chemistry and genes could be key to understanding why some people become addicted to nicotine and why the chemical compound's effects appear to diminish at night, University of Colorado at Boulder researchers say.

"The depth of a person's addiction to nicotine appears to depend on his or her unique internal chemistry and genetic make-up," said lead author Jerry Stitzel, an assistant professor in CU-Boulder's department of integrative physiology and researcher with CU-Boulder's Institute for Behavioral Genetics.

Stitzel presented his team's findings in San Diego on Monday at Neuroscience 2007, an annual scientific meeting that is taking place through Wednesday.

He and his team set out to evaluate the effects of nicotine over the course of a day by examining mice that could make and "recognize" melatonin, a powerful hormone and antioxidant, and others that could not. Scientists believe that melatonin, which is produced by darkness, tells our bodies when to sleep.

The CU researchers found that the reduced effects of nicotine at night were dependent on the mice's genetic make-up and whether their brains and bodies were able to recognize melatonin. They also found that the daytime effects of nicotine were greatest when levels of the stress hormone corticosterone were high.

The second finding could explain why many smokers report that the first cigarette of the day is the most satisfying. Cortisol, the human equivalent of corticosterone, is at peak levels in the early morning, Stitzel said.

"The negative health consequences of smoking have become well known, and a large majority of smokers say that they would like to quit," Stitzel said. "As such, we need to understand the interaction between smoking, genes and internal chemistry so we can target new therapies to those who have a hard time quitting."

While the team's research could shed light on why people smoke and how nicotine affects them, Stitzel says more research is needed to determine the role that melatonin plays in altering the effects of nicotine, and whether the correlation between higher corticosterone levels and nicotine sensitivity is a coincidence.

Source: University of Colorado at Boulder

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