

New study demonstrates nicotine's role in smoking behavior

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Tobacco dependence is the leading cause of mortality in Canada. Although most smokers express a desire to stop smoking, only a small number are able to succeed. A new study from the Centre for Addiction and Mental Health (CAMH, Canada) and the National Institutes of Health (NIH, USA) reveals that nicotine use is highly addictive in primates.

Although research has demonstrated that tobacco is highly addictive in humans, there has been persistent debate over the role nicotine plays in reinforcing smoking. This study is the first of its kind to evaluate the motivational value of nicotine in experimentally naive monkeys. This study was conducted at NIH under the leadership of Dr Bernard Le Foll, CAMH Scientist and Head of the Translational Addiction Research Laboratory and Associate Professor at the University of Toronto.

"These results demonstrate that nicotine plays a critical role in maintaining smoking behaviour," said lead researcher Dr. Le Foll.

While there are multiple reasons why people smoke, this study supports earlier findings identifying biological reasons for cigarette addiction. In order to examine the reinforcing effects of nicotine, Dr. Le Foll and colleague Dr. Steven R Goldberg (NIH) tested naive squirrel monkeys for their motivation to take nicotine. In these tests, the animals could voluntarily self-administer nicotine by pressing on a lever. Receiving nicotine was associated with distinctive environmental cues, to mimic the situation associated with tobacco smoke in humans. Whereas animals

initially showed no preference for the active lever, over time a strong preference for the lever delivering nicotine developed. Animal subjects were motivated to press a lever up to 600 times to get a single injection of nicotine.

"This clearly demonstrates a high motivation to get nicotine that develops over time", said Dr. Le Foll.

This novel animal model, which closely mimics the human situation, will provide a venue for the development of novel medications for tobacco dependence.

"The importance of nicotine in tobacco smoking supports the use of nicotine replacement therapy or of varenicline (a novel medication that mimics the effects of nicotine) to treat smokers", said Dr. Le Foll.

Source: Centre for Addiction and Mental Health

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