

Why smokers are thinner? Nicotine triggered appetite suppression site identified in brain

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It is widely known that smoking inhibits appetite, but what is not known, is what triggers this process in the brain. Now researchers from Baylor College of Medicine, participating in a Yale University School of Medicine-led study, have identified the nicotine receptors that influence the anorexigenic signaling pathway, or appetite suppression pathway.

The findings are published in the current edition of the journal *Science*.

"The [hypothalamus](#) is an area in the brain that integrates signals coming from our gut and fat telling our brain that we need food or we've had enough calories," said Dr. Mariella De Biasi, associate professor of neuroscience and assistant director of the Center on Addiction, [Learning and Memory](#) (CALM) at BCM.

In the study, lead investigator Dr. Marian Picciotto, Yale University School of Medicine, and her research team focused on nicotine receptors expressed in the hypothalamic neurons that control the motivation to eat. In mice, they were able to determine that a particular [nicotinic receptor](#) subtype, the $\alpha 3\beta 4$ nicotinic receptor, can influence how much a subject eats. They found that when [nicotine](#) binds to this receptor, pro-opiomelanocortin (POMC) neurons are activated, beginning the process that leads to appetite suppression.

"Identifying this receptor is important for the understanding of the mechanisms related to addiction, weight and smoking. Right now these results are only in mice, but this could open the door to finding

therapeutic measures to help people quit smoking without gaining weight," said De Biasi. "For many people weight gain is a deterrent to quitting smoking, and our results suggest that drugs that stimulate the $\alpha 3\beta 4$ nicotinic receptor might help to limit weight gain following smoking cessation."

De Biasi adds that choosing to smoke, or to not quit, because of how it affects a person's weight is extremely dangerous. Smoking contributes to cardiovascular disease, certain types of cancer including lung cancer, reproductive disorders and premature wrinkling, just to name a few. Any benefit from weight loss is ineffectual when these side effects are taken into account.

De Biasi concludes that this study "is not only important for the people that are trying to quit smoking, but the results provide a target for the development of drugs that might help to control obesity and related metabolic disorders".

Provided by Baylor College of Medicine

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