



**Press Release**

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## Enhanced Sweet Taste: This is Your Tongue on Cannabis

*Endocannabinoid modulation of tongue sweet taste receptors may help control feeding behavior*

PHILADELPHIA (December 21, 2009) -- New findings from the Monell Center and Kyushu University in Japan report that endocannabinoids act directly on taste receptors on the tongue to enhance sweet taste.

“Our taste cells may be more involved in regulating our appetites than we had previously known,” said study author Robert Margolskee, M.D., Ph.D., a Monell molecular biologist. “Better understanding of the driving forces for eating and overeating could lead to interventions to stem the burgeoning rise in obesity and related diseases.”

Endocannabinoids are substances similar to THC, the active ingredient in marijuana. Produced in the brain and body, they bind with cannabinoid receptors to help regulate appetite and many other processes involved in health and disease.

“Endocannabinoids both act in the brain to increase appetite and also modulate taste receptors on the tongue to increase the response to sweets,” said study senior author Yuzo Ninomiya, Ph.D., Professor of Oral Neuroscience in the Graduate School of Dental Sciences at Kyushu University in Japan.

In the study, published online in the *Proceedings of the National Academy of Sciences*, the researchers conducted a series of experiments in mice to determine the behavioral, neural and cellular responses to sweet taste stimuli before and after the administration of endocannabinoids.

Sweet taste responses were enhanced by endocannabinoids in every case. The effect was specific for sweet taste, as endocannabinoids had no effect on responses to sour, salty, bitter or umami taste stimuli.

The effects were abolished when the experiments were repeated using knockout mice lacking the CB<sub>1</sub> cannabinoid receptor. Additional studies revealed that the CB<sub>1</sub> receptor and the T1R3 sweet taste receptor are present in the same taste cells.

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Together, the experiments demonstrate that endocannabinoids selectively enhance sweet taste by acting on tongue taste cells and that the effect is mediated by the endocannabinoid receptor.

“Modulation of sweet taste responses may be an important component of the endocannabinoid system’s role in regulating feeding behavior,” said Margolskee. He parenthetically noted that the well-known "marijuana munchies" may depend at least in part on endocannabinoid stimulation of tongue taste cells.

Sweet taste receptors also are found in the intestine and pancreas, where they help regulate nutrient absorption, insulin secretion and energy metabolism. If endocannabinoids also modulate the responses of pancreatic and intestinal sweet receptors, the findings may open doors to the development of novel therapeutic compounds to combat metabolic diseases such as obesity and diabetes.

Also contributing to the study were Ryusuke Yoshida, Tadahiro Ohkuri, Masafumi Jyotaki, Toshiaki Yasuo, Nao Horio, Keiko Yasumatsu, Keisuke Sanematsu, Noriatsu Shigemura, Yuzo Ninomiya from Kyushu University and Tsuneyuki Yamamoto from Nagasaki International University.

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The Monell Chemical Senses Center is an independent nonprofit basic research institute based in Philadelphia, Pennsylvania. Monell advances scientific understanding of the mechanisms and functions of taste and smell to benefit human health and well-being. Using an interdisciplinary approach, scientists collaborate in the programmatic areas of sensation and perception; neuroscience and molecular biology; environmental and occupational health; nutrition and appetite; health and well-being; development, aging and regeneration; and chemical ecology and communication. For more information about Monell, visit [www.monell.org](http://www.monell.org).