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Sweet Minty Relief for Cough

PHILADELPHIA (June 11, 2012) – Millions of Americans reach for their cough drops or syrup at the first sign of a cough. However, scientists are unsure if and how these popular remedies work. Now, new findings from the Monell Center suggest that sucrose and menthol, ingredients commonly regarded as flavorings in these preparations, each act independently to reduce coughing.

Cough is a vital protective reflex that clears the respiratory tract of threats from mechanical stimuli like food and chemical stimuli such as airborne toxins and pollutants. As such, cough is necessary to protect the lungs, keep airways clear, and preserve life.

“Individuals with a weak cough reflex are at increased risk of pneumonia and of choking. Conversely, many acute and chronic conditions involve frequent coughing, leading to 30 million health care visits annually, with billions spent on over-the-counter medications and billions more lost due to reduced productivity,” said lead author, Paul M. Wise, Ph.D., a sensory psychologist at Monell.

However, many aspects of coughing remain poorly understood, including how chemicals act to trigger and modulate cough.

In the current study, which appears in the June 2012 issue of *Pulmonary Pharmacology and Therapeutics*, 12 healthy young adults inhaled from a nebulizer containing capsaicin, the burning ingredient in chili peppers and a potent chemical stimulus for cough. After each inhalation, the amount of capsaicin was doubled. This procedure continued until the subject coughed three times within 10 seconds. The capsaicin concentration that induced the three coughs was labeled as the individual’s cough threshold.

In some sessions, the subjects held either a very sweet sucrose or plain water in their mouths for three seconds, spat the liquid into a sink, and then inhaled from the nebulizer.

In other sessions, subjects inhaled three breaths of either menthol-saturated air or clean air before each capsaicin inhalation. The menthol concentration was selected to approximate the cooling intensity of a menthol cigarette.

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Both sucrose and menthol increased the amount of capsaicin needed to elicit a cough relative to plain water or clean air, respectively. Sucrose increased cough threshold by about 45 percent, while menthol increased it by approximately 25 percent.

“This is the first study to empirically show that sweet taste reduces cough. This also is the first study to show that menthol alone can reduce coughing in response to a cough-eliciting agent,” said Monell sensory scientist Paul Breslin, Ph.D., an author on the study.

The findings support the hypothesis that adding menthol to cigarettes, popularly known as “menthols,” may make it easier to begin smoking by suppressing the cough reflex, thus making the first cigarettes less distressing.

“Menthol may dull the sensitivity of sensory nerves in the airways and thereby actually disable an important reflex mechanism that would otherwise protect smokers from the chemical and particulate irritants present in cigarette smoke,” said Wise.

Studies at Monell will continue to explore the chemical elicitation of cough, along with the receptors and genes involved in this system.

Also contributing to the research was Pamela Dalton, Ph.D., of Monell. Breslin also holds a position as professor in the Department of Nutritional Sciences at Rutgers University. Funding was provided by the National Institute on Deafness and Other Communication Disorders of the National Institutes of Health.

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 program 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.