

Food peptides activate bitter taste receptors

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Researchers from the Monell Center and Tokyo University of Agriculture have used a novel molecular method to identify chemical compounds from common foods that activate human bitter taste receptors.

The findings, published in the journal *Biochemical and Biophysical Research Communications*, provide a practical means to manipulate food flavor in general and bitter taste in particular.

“Identification of bitter taste compounds and their corresponding receptors opens doors to screening for specific bitter receptor inhibitors,” said senior author Liquan Huang, PhD, a molecular biologist at Monell. “Such inhibitors can be used to suppress unpleasantness and thereby increase palatability and acceptance of health-promoting bitter foods, such as green vegetables or soy products.”

While a little bitterness is often considered a desirable component of a food’s flavor, extensive bitterness can limit food acceptance.

About 25 different human bitter receptors have been identified from human genome sequences. However, only a few of these bitter receptors can be activated by known chemical compounds. The remainders are ‘orphan receptors,’ meaning that the compounds that bind to and activate them have not been identified. Consequently, it is unclear how these orphan receptors contribute to bitter taste perception.

Huang and his collaborators ‘deorphanized’ several bitter receptors by

demonstrating that peptides from fermented foods can specifically stimulate human bitter taste receptors expressed in a cell culture system.

Fermented foods, such as cheese or miso, are characterized by bitter off-tastes. These foods also contain abundant quantities of peptides, which are short chains of amino acids, the building blocks of proteins.

The results reveal the molecular identities of chemical food components responsible for the bitterness of fermented foods and demonstrate that bitter-tasting peptides are detected by human bitter receptors in an analogous manner to other bitter compounds.

“Information on how food constituents interact with receptors is needed to design and identify inhibitors and enhancers that can be targeted towards specific bitter compounds,” says Huang. “Our findings may help make health-promoting bitter foods such as broccoli more palatable for children and adults.”

Source: Monell Chemical Senses Center

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