

**TECHNOLOGY**

# Peptide Additives to Enhance the Acceptance and Consumption of Baits by Rodents

**OVERVIEW**

Rodenticides are used to control rodent pests in residential, industrial and agricultural settings. Neophobic responses to unfamiliar food types, micro-sampling and learned poison shyness are factors that reduce bait acceptance by target rodents, reducing their effectiveness. It has been shown that Rodents exhibit a preference for food sources that are in close proximity to conspecific social odors and find food sites marked by such odors as attractive. Researchers have identified a natural peptide compound that can be used to induce a similar odor cue in rodents. The peptide promotes the acquisition of food preferences, and stimulates innate food acceptance behaviors in rodents through activation of specialized neural pathways. The peptide is not an attractant, but rather acts as an olfactory cue that supports the formation of socially transmitted food preferences. The peptide conditions the rodents to prefer and ingest targeting baits. Effects of the compound on edible preference can last for several weeks. This compound can potentially augment rodent control strategies that rely on the consumption of rodenticide baits.

This technology engages the innate food behaviors in rats and mice to enhance the acceptability of novel baits and other edibles. This promote increased consumption of these baits/edibles over periods of days or weeks. Rodent studies confirmed a robust and statistically significant food preference for rodenticide-laced foods when primed with the peptide. The studies also confirmed the need for only minute quantities to induce the preferential effect that would last days after induction. This technology has the potential to be formulated into existing rodenticide products to improve their efficacy.

**PHOTOS**

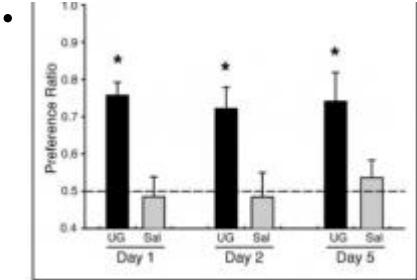


Figure 1 Peptide (UG) preference compared

## APPLICATIONS

The worldwide pesticide market was an estimated \$39.4 billion in 2007, with \$12.5 billion sold in the United States alone. Of this, approximately \$1.3 billion is for rodent control and rodent control services. Current methods to increase rodenticide effectiveness require large quantities of the active agent to be distributed and for a longer period. This in turn provides additional time and opportunity for children, pets and non-targeted wildlife to encounter and ingest the poison. Recent EPA policies (<http://www.epa.gov/pesticides/mice-and-rats/>) have sought to reduce these off-target poisonings by requiring changes to rodent control systems sold for consumer use. Additionally, the cost of wide and repeated distribution of the poison is higher than it would be if the rodents would frequently sample the same bait.

## ADVANTAGES

- Ø Utilization of the rodent's innate biology to enhance the effectiveness of existing rodent pest control systems
- Ø Reduce costs and opportunities for poisoning of non-target species.
- Ø Assimilation into current products to enhance the effectiveness of rodenticides

## STAGE OF DEVELOPMENT

Experimental evidence in mice shows the peptide to be both efficacious and specific at the cellular and behavioral levels in promoting the acquisition of preferences for foods with defined flavors. Ongoing studies are investigating: the influence of rodenticides on preference acquisition and preferential ingestion; the durability of the acquired preference; and the effectiveness of related peptides.

## R&D REQUIRED

Studies are needed to assess: effectiveness with different classes of rodenticides; optimum peptide levels needed to enhance rodenticide ingestion; efficacy of related peptides; the best method for delivery of the peptide with bait flavors; field tests (i.e., outside of the laboratory).

(Updated 9/2017) - MEW

## LICENSING POTENTIAL

UM seeks to develop and commercialize by an exclusive or non-exclusive license agreement and/or sponsored research with a company active in the area.

## CONTACT INFO

Office of Technology Transfer  
620 W Lexington St., 4th Floor  
Baltimore, MD 21201  
Email: [ott@umaryland.edu](mailto:ott@umaryland.edu)  
Phone: (410) 706-2380

## Additional Information

### INSTITUTION

University of Maryland, Baltimore

### PATENT STATUS

Issued, US Patent No.9,757,426, issued date 09/12/2017

### LICENSE STATUS

Available for licensing

## **CATEGORIES**

- Clean Technology
- Other

## **INVESTIGATOR(S)**

Steven Munger

## **ATTACHMENTS**

-  [Download SM-2013-065 marketing summary 9.2017.pdf](#)

## **EXTERNAL RESOURCES**

- [The Receptor Guanylyl Cyclase Type D \(GC-D\) Ligand Uroguanylin Promotes the Acquisition of Food Preferences in Mice](#)
- [An olfactory subsystem that detects carbon disulfide and mediates food-related social learning](#)
- [Contribution of the receptor guanylyl cyclase GC-D to chemosensory function in the olfactory epithelium](#)
- [Importance of the CNGA4 channel gene for odor discrimination and adaptation in behaving mice](#)

SM-2013-065