

# New way to smell a rat means end for rodents

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Left to right: Gerhard Gries and Stephen Takácsrat with rat trap. Greg Ehlers/SFU

Simon Fraser University scientists have developed a new way to exterminate rats by identifying and synthetically replicating the male brown rat's sex pheromone. The chemical is a powerful attractant for

luring female brown rats into traps.

At a time when rat populations around the world are inflicting serious harm, understanding rat behaviour and preferences is important. Rats spread disease and allergens, diminish agricultural crop yields, and threaten animals and endangered seabirds. The brown rat is the world's most common rat, and its population is growing, in part because [rats](#) have evolved to avoid newly placed traps in their natural habitat.

SFU biologists Gerhard Gries, Stephen Takács and Regine Gries, research chemist Huimin Zhai say their latest pheromone discovery overcomes that trap-avoidance behaviour. In the lab, and in field experiments, female [brown rats](#) readily enter trap boxes baited with the male brown rat's [sex pheromone](#).

"We're beginning to speak rat," says Gerhard Gries, professor of biological sciences and NSERC Industrial Research Chair in Multimodal Animal Communication Ecology at SFU.

"We're beginning to understand their pheromones (chemical attractants), we understand their sound communication and can reproduce it, and we understand their food preferences."

The discovery forms part of a promising three-pronged rat control tactic the researchers are developing that exploits the rats' own communication system. It promises to enhance rat capture tenfold or more, and to eliminate poison-bait stations that kill rats and the predators that eat them.

The scientists' rat pheromone research was published last week in the academic journal *Angewandte Chemie, International Edition*. Their rat sound research appeared in *Pest Management Science* a few weeks ago.

They envision using their findings to revolutionize how rats are trapped.

With the help of Pawel Kowalski in SFU's Science Technical Center, they have already built an electronic gadget that incorporates a specially designed algorithm that can randomly and intermittently replicate rat pups' vocalizations. And with the help of graduate student Antonia Musso they have developed a special food bait that not only attracts rats but also induces them to feed, which is necessary to trigger the traps' capture mechanism.

By combining the effective food bait with the rats' sex pheromone and sound signals, they expect to overcome the rats' antipathy to trap boxes.

"The overall message," says Gries, "is that here is some great food to eat, and here is safety, because not only can they hear "live" rats, they can also smell the male rat's sex pheromone. Since it seems entirely safe, they enter the trap box, feed on the bait and are killed in the snap trap."

The research is funded through NSERC and industrial partner Scotts Canada Ltd., which holds the rights to commercialize the research findings.

The discovery comes just a year after Gries and other SFU researchers announced a successful way to lure and trap bedbugs. That trap is currently being commercialized.

Provided by Simon Fraser University

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