



# Covert Ops:

“Cheap, discrete and long-lasting, chemical signals are the most efficient way to communicate, apart, perhaps, from e-mail.”

**Leslie B. Vosshall**  
Chemers Family Associate Professor

## The Chemicals behind Invisible Communications

THURSDAY, DECEMBER 28, 2006  
10:30 A.M. - 2:30 P.M.

LUNCH SERVED  
12:00 P.M. - 1:00 P.M.

LECTURE WILL BE HELD  
IN **CASPARY AUDITORIUM**

THE ROCKEFELLER UNIVERSITY  
1230 YORK AVENUE  
(AT EAST 66TH STREET)  
NEW YORK, NY 10021

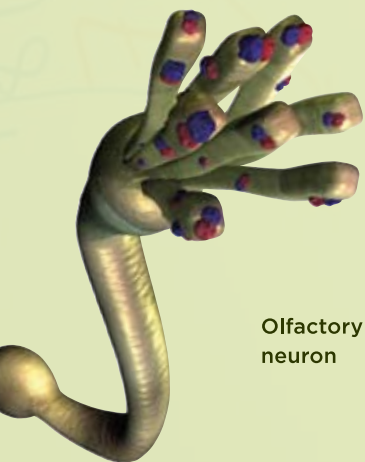
In every peaceful meadow or serene forest there is a hidden war going on, with invisible signals and messages being sent every second in a life-or-death spy game. Interpreting the message correctly could save your life, while ignoring the signal could end it.

From microscopic worms to grizzly bears, animals rely on these covert communications that use tiny chemicals to engage the senses of smell and taste. Coupled with sight, touch and hearing, these mechanisms of perception give animals all of the clues they need to make instant decisions, including what to eat, when to fight and when to head for the hills. People are no different, using taste to know where to draw the line on spicy food and smell to know when milk has soured or how much cologne is too much.

Though, as midnight munchies can wreak havoc on the fridge, so can insects fending for their next meals — devastating crops or aiding in the spread of disease. Scientists are now beginning to understand how animals transmit and receive the signals that drive their behavior, and are learning how to manipulate them to save crops and lives. While the sense of taste is very simple and direct, smell is complicated, with each animal or insect having hundreds of different chemical receptors in the nose that can distinguish thousands of separate smells.

Specialized signals are also sent in the form of pheromones. These simple molecules can elicit a fight-or-flight response, help an animal recognize a brother, find a mate or mark territory. When compared to all the other ways of communicating — bright markings or beautiful songs — chemical signals are the most diverse and direct way to talk to a friend without attracting an enemy.

Rockefeller University's Leslie Vosshall, head of the Laboratory of Neurogenetics and Behavior, explores how these invisible chemical messages help us interact with our environment, and how our environment interacts with us. She will show how new research is allowing us to enter the chemical spy game and decode nature's text messages. And how the results could help us lure insects away from crops and create insect repellents that render insects blind to people.



Olfactory neuron



*Drosophila melanogaster*



Lily