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## Faculty & Research

### Barry A. Trimmer

Professor, Henry Bromfield Pearson Professor of Natural Sciences  
 Director, [Tufts Biomimetic Devices Laboratory](#)  
 Neurobiology

#### Education

Ph.D., University of Cambridge, England  
 Neurobiology: Cellular and Molecular Processes Underlying Behavior

Graduate Research Area: [Neurobiology](#)

#### Research Interests

Dr. Trimmer's laboratory is interested in the neural processes that organize sensory and motor information. We use an insect (the tobacco hornworm, *Manduca sexta*) as our model system because it has a brain with fewer neurons, many of which can be identified and kept alive outside the animal.

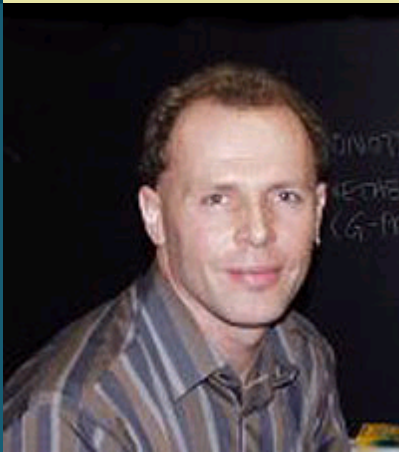
Currently we are pursuing three major projects:

1. The neural control of soft-bodied locomotion where we are trying to understand how the nervous system controls complex movements. These studies have potential applications in the design and control of a new type of flexible robot using neuromechanics.
2. The structure and function of neuronal acetylcholine receptors. These receptors mediate the transmission of sensory information into the brain and we are looking at the biochemical and electrical components of signaling and how different types of receptors interact. Our findings could be relevant for alleviating nicotine addiction and for understanding epilepsy.
3. The range and specificity of nitric oxide (NO) signaling in the brain. Comparatively little is known about the role of this free-radical transmitter in the brain. We have identified individual NO-producing and responding neurons in the living nervous system and our goal is to establish how they communicate and what behaviors they control. This work will help to understand how groups of neurons are coordinated and how the brain is damaged by a stroke or other traumatic injury.

#### Courses

[Biology 134](#): Neurobiology  
[Biology 49](#): Experiments in Physiology  
 Electrical Engineering 100: Design of Medical Instrumentation

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