CENTER FOR EXCELLENCE in the
NEUROSCIENCES

SEMINAR SERIES

He Said, She Said: Sexually Dimorphic Responses to Injury in the Auditory System of the Cricket

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Friday, April 17th 2015
12:00-1:00 p.m.

Pickus 214
UNE, Biddeford Campus

Lunch will be provided

Hosted by: Geoff Ganter, Ph.D.
Sponsored by: The Center for Excellence in the Neurosciences

Dr. Hadley Horch received her undergraduate degree from Swarthmore College in Philadelphia. She went on to work with Dr. Larry Katz at Duke University. Her PhD focused on the role of brain-derived neurotrophic factor (BDNF) in the development of dendrites in the visual cortex of ferrets. She completed a brief postdoc with Dr. Ron Hoy at Cornell University in which she began to revisit a project he began nearly 20 years prior focused on the plasticity of the auditory system of the cricket. At Bowdoin College, she has worked with undergraduates to explore the molecular basis of this injury-induced dendritic plasticity in the cricket auditory system.

Abstract: The consequences of injury in adult central nervous systems are often devastating and irreversible.The auditory system of the cricket is unusual in that it is capable of compensatory plasticity after injury. Unilateral deafferentation of the auditory neurons of the prothoracic ganglia induces these cells to send dendrites across the midline, a boundary they typically respect, to form synapses with contralateral auditory afferents. Past experiments have shown that this compensatory growth is remarkably precise, reinstating interneuron-specific tuning curves within several days. Careful anatomical analysis indicates that female dendrites grow rapidly across the midline but then stall in growth by about 5 days.Male dendrites, in contrast, are slower to cross the midline, but extend, on average, twice as far as female dendrites after several weeks.Our lab is investigating a number of candidates, including the family of semaphorins, that might be involved in this compensatory response to injury.We use dsRNA to manipulate expression levels and then measure the resulting physiological and morphological recovery. In addition, we are beginning to compare and contrast auditory plasticity with the plasticity endemic to other sensory systems, such as the cercal system, in the cricket.