

# SPECIAL RESEARCH SEMINAR

Presented by the Center for Human Neuroscience Research at the Fralin Biomedical Research Institute at VTC



FRALIN BIOMEDICAL RESEARCH INSTITUTE AT VTC  
CENTER FOR HUMAN  
NEUROSCIENCE RESEARCH  
VIRGINIA TECH.



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## *In Person Seminar: A Model for Modulation of Hebbian Plasticity and Its Potential Role in Regulating Attention in the Honey Bee (*Apis mellifera*)*

A honey bee colony contains a mixture of many different genotypes because of multiple mating by the queen, which is important for integration of colony function. With respect to learning performance, Dr. Smith's lab and others have shown that foragers differ in how they perform on basic learning tasks, and that this variation arises from their genotypes. For example, repeated exposure to an odor without reinforcement produces Latent Inhibition, which is revealed by slower learning about the now 'familiar' odor relative to a 'novel' one. Dr. Smith's team has shown that they can establish high and low lines with respect to how workers perform on this task. Field colonies treated with foragers of one genotype or the other, or to a mixture, show that this genotype reflects attention to known resources versus exploration for new ones. QTL mapping of high and low lines has shown that the biogenic amine receptor Amtyr1 is associated with different behavioral performance. The lab has disrupted functioning of this gene to show how it affects Latent Inhibition, which combined with computational modeling and mapping its distribution in the brain suggests a model of how it is integrated as a kind of gain control into neural circuitry. Amtyr1 has now been implicated in several disparate behaviors in honey bees. From a mechanistic standpoint, why, and how, can one gene have such broad phenotypic effects? The answer may lie in how Amtyr1 works with a broader set of genes, potentially different sets in different areas, that may be engaged in gene networks.

**MONDAY, SEPT. 11, 2023 at 11 a.m.**

Room R3012, 2 Riverside Circle  
Or watch via Zoom: <https://virginiatech.zoom.us/j/84038438440>



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