

# UNT SEMINAR

Presented by the Department of Biological Sciences

## ***Nathan Tublitz***

University of Oregon

### **A Spineless Approach to Peptide Mediated Neuroplasticity in Moths, Flies and Cephalopods.**



This talk will present several mechanisms underlying peptide mediated neuroplasticity in three invertebrate taxa. The first is at the cellular level in the moth *Manduca sexta*. *Manduca* has a set of larval neurons that express a subset of Cardioacceleratory Peptides (CAPs). During metamorphosis these neurons undergo a complete transformation, changing their physiological, biochemical and morphological properties. This cellular

alteration is hormonally-triggered by the insect steroid hormone 20-OH ecdysone. CAP expression in other neurons is also significantly altered during metamorphosis.

The second part of the talk will focus on peptide-mediated plasticity at the developmental level in the fruit fly *Drosophila melanogaster*. Two CAPs, CCAP and CAP2b, are expressed in the mesodermally-derived midline mesoderm cells (MMCs) of *Drosophila*. The MMCs extend a neuronal-like process, express neuronal markers, have voltage-dependent channels, and contain bioactive CAPs. These data suggest that the MMCs function as neurosecretory cells despite their non-neural origins.

The final example of peptide-mediated plasticity is at the system level, centering on the neural control of body patterning behavior in cephalopods. Unshelled cephalopods exhibit a wide range of body patterns used for camouflage as well as inter- and intra-species communication. Cephalopod body patterns are highly plastic; they are generated in less than a second and can be held for a fraction of a second or for hours. Cephalopods also produce amazingly dynamic body patterns. These body patterns are formed by a unique chromatophore system under direct neuromuscular control. Molecular, cellular and physiological evidence for the regulation of chromatophore activity by the family of FMRFamide-related peptides (FaRPs) as well as a parallel glutamatergic control system will be provided. Central control of these two systems will also be presented.

**April 15, 2011**

**2:00 PM**

**ENV 130 (EESAT)**