

Jennifer Plum

Neuroscience, CBS, 2008

Mentor: Michael O'Connor, GCD

The Role of TGF- β Signaling in Learning and Memory in Different Species

The transforming growth factor beta (TGF- β) signaling pathway plays a critical, as well as diverse, role in the regulation of gene transcription. TGF- β signaling influences events such as embryonic development and apoptosis as well as cell differentiation. TGF- β signaling is an evolutionarily conserved pathway and is implicated in some human disorders. Using conditional gene knockdown techniques in the mouse and fruit fly, *Drosophila*, in addition to behavioral assays, we are able to look at the possible role TFG- β signaling pathway plays in behavior, or more specifically learning and memory. The human center for learning and memory is the hippocampus. By targeting knockdowns in areas correlated to the human hippocampus, the mouse hippocampus and the *Drosophila* mushroom body, we can then relate the findings to human conditions. Several components of the pathway are tested in a variety of behavioral assays. A transcription modulator, Smad4, is being looked at in the mouse. Three types of mutants, a pathway suppressor (Follistatin over-expression) and two modulators (Smad2 and Mad), are being studied in *Drosophila*. Mice are being tested for spatial learning and object recognition. *Drosophila* are being tested for short term and long term memory related to a learned courtship behavior. By doing these studies, we hope to gain further understanding of the roles of TGF- β signaling in regulating animal behaviors including learning and memory.

Poster Number: Session:

