FIRST ANNUAL DROSOPHILA RESEARCH SYMPOSIUM

Wednesday April 19, 2006
BSW 301
2:00PM – 5:00PM
Sponsored by BIO5 and the Department of Ecology and Evolutionary Biology

2:00PM  Guest Speaker

Dr. Thomas Jongens
Department of Genetics
School of Medicine
University of Pennsylvania

Characterization and Pharmacological Rescue of a Drosophila Model for Fragile X Mental Retardation

3:00-5:00PM
Poster Session and Refreshments

There will be a $1,000 prize for the best graduate student poster*

* graduate students with at least one year remaining before graduation are eligible. Students wishing to be considered should submit their titles to Dr. Stacy Mazzalupo, Tucson Stock Center at smm@email.arizona.edu by April 14.
Abstract: Fragile X syndrome is the most common heritable form of mental retardation. Although the hallmark feature of this disease is mental retardation, the majority of patients with Fragile X syndrome also display an array of behavioral abnormalities. This disease is caused by loss of fragile X mental retardation (FMR1) gene expression. This is usually caused by a trinucleotide repeat expansion in the 5’ UTR of the gene. The protein encoded by the FMR1 gene (FMRP) is a selective RNA-binding protein. Although its full function remains to be elucidated, previous studies have indicated that it can act as a translational regulator. We have developed a Drosophila model for Fragile X syndrome based on mutants of the dfmr1 gene, the only homologue of the FMR1 gene in the Drosophila genome. dfmr1 mutants display several behavioral phenotypes that bear similarity to symptoms displayed by Fragile X patients. These phenotypes include a lack of detectable memory in a courtship-based learning and memory paradigm, circadian defects, erratic locomotor activity and subtle neuronal defects. The similarity of phenotypes in our fly model to the symptoms of Fragile X patients suggest that FMRP has a conserved biological role throughout evolution. This thinking lead us to take note of recent studies of a mouse Fragile X model that showed that mice lacking Fmr1 activity display elevated levels of metabotropic glutamate receptor (mGluR) signaling. We have investigated similar mis-regulation in our Drosophila model by treating dfmr1 mutant flies with mGluR antagonists. Interestingly we have found that these drug treatments can rescue several of the mutant phenotypes including memory, courtship activity and some of the subtle neuronal defects. These results suggest that treatment of Fragile X patients with mGluR antagonist should be investigated as a possible route for treatment of Fragile X related symptoms.