BIOLOGY I

Section Moderator: Dr. Steve Murphree
Room: Beaman Hitch Science Building 207
Time: 7:00 – 8:00 PM

7:00 – 7:15
"A Phylogeny for the Salamander Family *Ambystomatidae* Based on a Nuclear Marker"

Alaina Reagan
Faculty advisor: John Niedzwiecki

Phylogenetics is the study of evolutionary relatedness among various groups of organisms. Two main approaches for studying phylogenetics are taken: morphological, the study of physical characteristics, and molecular, the study of organisms on a cellular level. Usually, these methods of study agree, but when they conflict, another direction must be taken. This is where more recently developed genetic testing can add to the pool of knowledge and potentially clear up the conflicting data.. Our project takes a chromosomal DNA approach to understanding relationships between salamander species and could help confirm or disprove the already existing data and make headway with new information. We were successfully able to amplify primers in many Ambystomatid species and we discuss some potential issues preventing successful amplification.

7:15 – 7:30
"Prevalence of *Trypanosoma cruzi* in Conenose Bugs (*Triatoma sanguisuga)* From Selected Sylvatic Areas in Middle Tennessee."

Ludia Kim
Faculty Advisor: Dr. Steve Murphree

Evidence suggests an increasing prevalence of *Trypanosoma cruzi*, the causative agent of Chagas disease, in Tennessee and other southeastern states. Conenose bugs (*Triatoma sanguisuga)* are endemic to middle Tennessee and are know to serve as hosts for *T. cruzi*, however the infection rate is unknown. Collection attempts in sylvatic areas in the Percy and Edwin Warner Parks (Davidson County) to determine the percentage infected with *T. cruzi* yielded one specimen. Polymerase chain reaction (PCR) analysis was performed on DNA obtained from the gut contents of the collected bug. DNA samples from the conenose bug specimen tested positive for *T. cruzi.* Additional specimens should be collected to determine the infection rate of conenose bugs in sylvatic areas and the public should be made aware of this potential health concern.

7:30 – 7:45
"Specificity of Anti-Predator Behavior in Streamside Salamander Larvae"

Lauren Oeser
Faculty advisor: John Niedzwiecki

Evolutionary changes and natural selection, such as anti-predator behaviors, are important to most aspects of science. In this research, we studied the specificity of anti-predator behavior in the streamside salamander, *Ambystoma barbouri*. The previously assayed behavior of the salamander larvae was compared in the presence of their most often encountered predator, the green sunfish, along with two other closely related fish species, the warmouth and bluegill sunfish. The results show that there is a trend between fish species and degree of anti-predator behavior exhibited by the larvae. As expected, the larvae reacted strongest to the predator they encounter most often, the green sunfish, and they responded the least in the sunfish more distantly related to the green sunfish, the bluegill. These results suggest that over time the larvae have developed the ability to detect something specific to the green sunfish, their main predator.

7:45 – 8:00
"Blocking the Effects of 6-OHDA in *Caenorhabditis elegans*"

Brittany L. Myers
Dr. Nick Ragsdale

Parkinson's disease is a neurodegenerative disorder characterized by death of dopaminergic neurons of the substantia nigra pars compacta. Caenorhabditis elegans have nervous systems that are analogous to humans and therefore, can be used as a Parkinson model system. 6-hyrdoxydopamine was found to increase locomotor activity in C. elegans, due to the destruction of dopaminergic neurons. By treating C. elegans with imipramine, the uptake of 6-OHDA was inhibited and normal locomotor activity was recorded. Furthermore, this model system was also treated with dopamine prior to 6-hydroxydopamine, reversing the previously observed changes in locomotion. Blocking the effects of the neurotoxin 6-OHDA in C. elegans can provide insight and contribute to the development of new Parkinson's disease treatments.