

BIOLOGY VI

Section Moderator: Dr. Nick Ragsdale
Room: Beaman Hitch Science Building 207
Time: 9:00 – 9:30 PM

9:00 – 9:15

“Aquatic Macro Invertebrates and the Distribution of *Ambystoma barbouri* in Central Tennessee”

William Baugher

Faculty advisor: John Niedzwiecki

Throughout the world, amphibian species are in decline. This is a danger because they are involved in incredibly important predator-prey relationships. This research has surveyed streams for macro invertebrate diversity and richness in an effort to locate streams suitable for the species *Ambystoma barbouri*, a mole salamander that is threatened in the state of Tennessee. According to the Macroinvertebrate samples taken from 10 Central Tennessee streams, there is a strong indication that the abundance of isopods and macro invertebrates in general are an indicator of a high quality stream that is suitable for *A. barbouri*. However, these trends were not supported by statistics. Finally, although the results do not provide a strong link between macroinvertebrate diversity and *A. barbouri* occurrence, this research did result in the discovery of the salamanders in a new stream system, the drainages of the Duck River in Tennessee.

9:15 – 9:30

“Confirmation of the Role of Programmed Cell Death and PMK-1 Pathways in *Caenorhabditis elegans* to *Streptococcus pneumoniae*”

Josh Cortopassi

Faculty Advisor: Dr. Nick Ragsdale

Humans are vulnerable to *Streptococcus pneumoniae*, a common infectious pathogen that can cause several deadly illnesses. The nematode *Caenorhabditis elegans*, however, has shown an innate immunity to *S. pneumo* through two immune responses: a PMK-1 p38 mitogen activated protein kinase pathway and apoptosis, or programmed cell death (PCD). In this experiment, these immune responses were confirmed in affectively fighting off *S. pneumo*, and a further investigation of a potential link between the PMK-1 pathway and PCD was explored. Using fluorescence and Nomarski microscopy, worms with disabled PMK-1 pathways (rendering them defenseless) were observed for visible signs of PCD. In an *nsy-1* PMK-1 mutant, gonadal PCD was observed, despite a good statistical chance that this worm would die from infection. Minimal evidence prevents us from acknowledging a strong link between these two immune responses. However, given the observation of PCD in a PMK-1 mutant, additional fluorescence imaging of PMK-1 mutants may provide additional data on a potential correlation.