3:30 - 3:45 p.m.
**Determining C. elegans Attraction to Cervical Cancer to Expand on the Nematode Scent Detection Test – A Cancer Screening System**
Parker Tumlin
Faculty Advisor: Robert T. Grammer, Ph.D.

C. elegans displays a positive chemotaxis to cancerous tissue secretions. Utilizing this behavior, as a cancer screening system has been shown effective for colorectal, breast, and gastric cancers, however its effectiveness with cervical cancers has not been evaluated. The goal of this project is to determine whether C. elegans are attracted to HeLa cells, a cell line derived from a cervical cancer. A dose-response curve of C. elegans response to dilutions of HeLa cancer cell secretions was established, finding that the nematode displays a significant attraction to the millionth dilution of the secretions. These results imply that the nematode scent detection test would also be effective for cervical cancers.

3:45 - 4:00 p.m.
**The Effects of Statin Drugs on Memory in Danio rerio**
Lindsey Dennis
Faculty Advisor: Lori McGrew, Ph.D.

Ever since the FDA revised warning labels on statins, controversy about their effects on memory has ensued. Numerous studies have been conducted, though the findings are conflicted. Some studies find statins have no effect on memory and learning, while others find they have adverse effects and still others that find they have beneficial effects. This study aims to investigate the effects of simvastatin on memory in a different model organism, *Danio rerio*. One group of fish was treated with simvastatin, while another group acted as a control. All groups were trained and tested in a T-maze. Choice latency and accuracy were measured for all of the fish after treatment. It was expected that fish treated with simvastatin would have poorer choice accuracy and greater choice latency than control fish indicating an adverse effect on memory. Treated fish were observed to have poorer choice accuracy and decreased choice latency when compared to control fish, though these results were not statistically significant. Overall, this study indicates trends that simvastatin may negatively affect memory, but decreases choice latency and should be further researched with a larger sample and over a longer period of time.
Investigation of the Regulation of CST6 by p53 During Cellular Stress
Jasmin Mohn
Faculty Advisor: Christopher E. Barton, Ph.D.

Since prior studies found the CST6 gene to be upregulated in unstressed HCT116-p53+/+ cells, the interaction between p53 and CST6 during cellular stress was investigated. In order to determine whether CST6 was upregulated by p53, HCT116-p53+/+ and HCT116-p53/-/- cells were stressed with 5-fluorouracil. RNA was isolated, converted to cDNA and amplified to conduct gel electrophoresis. Although a slight upregulation was visible to the unaided eye in the HCT116-wt cells, the upregulation of CST6 in these cells was not visible when recorded using a photograph. Therefore, the results are inconclusive. The experiment will need to be repeated and the amplification process has to be increased to draw a conclusion from the data. Further research could be within the scope of using different stressors or investigating a direct relationship between CST6 and p53.

Abundance of Earthworms Relative to Leaf Litter Mass and Exotic Plant Coverage
Laura Horton
Faculty Advisor: A. Darlene Panvini, Ph.D.

The invasion of European and Asian earthworm species has known detrimental effects on the abundance of native plant species and leaf litter in deciduous forests. The purpose of this study was to investigate the relationship between areas of varying invasive plant coverage, and invasive earthworm and leaf litter presence. Data were collected in a deciduous forested area by establishing three 100 meter transects, each with three 5x5 m² quadrats in areas of high, medium, and low invasive exotic plant coverage. Earthworms were collected using a mustard vermifuge in each quadrat. Leaf litter density in each quadrat was determined from dry leaf mass. The greatest earthworm abundance occurred in the quadrats with medium exotic plant coverage; fewer earthworms were found in the quadrats with the highest exotic plant coverage. The difference in dry leaf litter mass per coverage level was not significant, though less leaf litter occurred in the plots with the most exotic plants. The intermediate disturbance hypothesis might explain the greater number of earthworms in the plots with intermediate amounts of exotic plant coverage. This study is valuable as a reference for future sampling on this property to provide a better understanding of the movement patterns of invasive earthworms associated with each level of invasive plant coverage and leaf litter abundance.
4:30 - 4:45 p.m.
Emily Deas
Faculty Advisor: Robert T. Grammer, Ph.D.

Cell Metabolism published a study by Dr. Seung-Jae Lee showing glucose was found to shorten the lifespan of Caenorhabditis elegans. Aspartame, saccharine, and sucralose are all common artificial sweeteners known as Equal, Sweet’N Low, and Splenda respectively. Artificial sweeteners were designed as a low calorie substitute for glucose. Research was conducted following the procedure established from the study on glucose to determine how the artificial sweeteners would impact longevity. Each sample of Caenorhabditis elegans lived on a medium of 2% of either glucose, aspartame, saccharine, or sucralose throughout their lifetime. All of the Caenorhabditis elegans that consumed artificial sweeteners experienced a 14.3 to 23.1% decrease in longevity. The Caenorhabditis elegans that consumed glucose experienced a 14.3 to 30.8% decrease in longevity. This suggests that artificial sweeteners and glucose are processed in the same manner by the body and thus produce the same effects.

4:45 - 5:00 p.m.
Comparing the Anxiolytic Effects of Anandamides on Danio rerio
Brandy Sweet
Faculty Advisor: Lori McGrew, Ph.D.

Anxiety affects about 40 million adults in the US alone. Danio rerio are a popular model organism for studying the effects of various drugs including those designed to treat anxiety. Danios have receptors that are very similar to those found in humans that bind to endogenous cannabinoids. The purpose of this study was to measure the anxiolytic effects of a panel of cannabinoid agonists and antagonists in order to compare the zebrafish’s responses to those seen in humans. To assess anxiety, the zebrafish were placed into a novel dive tank and the time elapsed before they rose above the bottom one-third of the tank was measured. The Danios showed a range of responses to the anandamides which correlated to the two different receptor subtypes.