

SE&T Colloquium Series-Fall 2015

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| Speakers | Students from Chem 419 and Chem 420 Advisors: Drs. Dave Karpovich and Tami Sivy |
| Title | <i>Special Projects from Chem 419 and Chem 420</i> |
| Abstract | Under the supervision of Dr. Dave Karpovich and Dr. Tami Sivy, respectively, the students of Chem 419 and Chem 420 have been working hard on some very interesting special research projects. They will share their findings through poster presentations. (See their attached abstracts on the next page.) |
| Date | Tuesday, December 8 |
| Time | 4:10-5:00pm |
| Place | Pioneer 240 |
| | Refreshments will be served at 4:00pm. |

Special projects for Chemistry 419 - Environmental Analytical Methods – Fall 2015

The students of Environmental Analytical Methods (CHEM 419), instructed by Dr. Karpovich, have spent the Fall 2015 semester working on individual research projects of interest where soil, water, sediment and biota were analyzed for important contaminants. Three students used atomic absorption spectroscopy to analyze their samples. The projects included determination of zinc concentration in soil near a local highway as a result of tire wear, lead and arsenic in Kawkawlin River water, and aluminum in soil where fireworks are launched every year for the Fourth of July celebration in Bay City and Saginaw. Other students chose to study emerging contaminants including microplastics, perfluorooctane sulfonic acid (PFOSA), and trace pharmaceuticals. FTIR and gravimetric analysis were used to quantify the amount microplastics in the Saginaw River. HPLC-MS was used to determine the concentration of PFOSA in earthworms found on Wurtsmith Air Force Base as well as trace pharmaceutical contaminants fluoxetine, progesterone, and triclosane in wastewater effluent from Bay City. HPLC-MS was also utilized to determine oxygen isotope ratios to track the source of phosphate found in Kawkawlin River water and sediment. Polychlorinated biphenyls (PCB's) and Polycyclic aromatic hydrocarbons (PAH's) are both well-known contaminants that were analyzed via GC-MS in both sediment and water samples from the region. The students from Chemistry 419 will present posters outlining their methods and findings.

Special projects for Chemistry 420 – Biochemistry II – Fall 2015

The Biochemistry II class worked on small group projects in the fall of 2015. These were designed by the students, with the work being carried out over 6 weeks. Please join us for a poster session that will allow the students to present their projects:

- Due to the increased hype regarding the labeling of GMO's, various corn samples and processed corn products were evaluated using PCR methods in order to detect genetic modifications and confirm or refute labels.
- Because contact wearers are at an increased risk of corneal infections by bacteria, fungi, etc, we are testing the effectiveness of different contact lens solutions with different active ingredients in killing *E.coli* grown on contact lenses.
- Cannabidiol (CBD), a natural compound found in hemp, has been shown to have antibacterial properties. We are testing its effects on the growth rate of both gram negative and gram positive bacteria samples. We hypothesized that the CBD would slow or stop the growth of our bacteria samples.
- We studied the effect of quinine on bacterial growth to determine if the inhibitory effect it has on malaria can be duplicated among bacterial cells. The idea was to see if simple tonic water or derived quinine could be used to decrease bacterial growth.
- We discovered a mutual interest in food science, thus decided to quantitatively and qualitatively measure protein in various food sources to determine whether differences could be seen in vegetarian versus omnivarian diet.