

Welcome to the 17th Annual P.U.R.E. Symposium “Spring Session”!

Tues Apr 19th, 2022, LSF 205

Snacks 3:45, Talks begin at 4:00pm



This Semester’s Presentations and Speakers:

4:00 – 4:15pm:

"Poison and cure? Investigating the antimicrobial properties of *Kalmia latifolia* tincture"

Student: Cody Collier Faculty Mentor: Dr. Jeremy Rentsch

Kalmia latifolia, commonly known as Mountain Laurel, is a flowering plant species native to the eastern United States. *Kalmia* is known to be toxic and is one of the few species of Rhododendrons that can be used to make ‘mad honey’ or toxic honey made with the nectar from the plant. A study published in the Journal of Natural Products found and identified ten grayanotoxins, or toxins exclusive to the Ericaceae family of plants, in the leaves of *Kalmia latifolia*. Regardless of the toxicity of the plant, its extracts are used around the world as a source of homeopathic medicines. *Kalmia* is used homeopathically as a treatment for hypertension, diabetes mellitus, and to treat stomach and gastrointestinal issues, and even taken as an aphrodisiac. It is important to note that there is no scientific evidence to support the effectiveness of homeopathic treatments with *Kalmia*. The reason *Kalmia* was chosen for this study was to test the toxin’s effects against bacteria, and to investigate whether the plant had any antibiotic effects. This study is important because of the recent rise of drug-resistant bacteria where simple bacterial infections are becoming harder to treat and cure due to increased resistance to our current treatments. If the extracts of *Kalmia* are found to have significant results against bacterial life, the tinctures and extracts of *Kalmia latifolia* can be investigated for new antibiotic potential.

4:15 – 4:30pm:

"Regulation of the Dhurrin Biosynthetic Pathway in *Sorghum halepense* seedlings" Student:

Connor Purvis Faculty Mentor: Dr. Jeremy Rentsch

Sorghum halepense or Johnsongrass is cited as one of the world's most noxious weeds by many accounts. Though it was first brought over to use as a feed for cattle, it is of great use because of its high yields. Death by cyanide poisoning in cattle raised awareness that there were underlying processes in Johnsongrass that were not known. A cyanogenic glucoside dhurrin was found to be the cause of the cyanide buildup in *S. halepense*. Studies have shown that stress and age of *S. halepense* affect the dhurrin production. This study aimed at understanding the correlation between *S. halepense* age and the dhurrin production. This was done by isolating RNA from seedlings of *S. halepense* by week and synthesizing cDNA. That cDNA was then utilized for qPCR to look at the regulation of four genes. CYP79A1, CYP71E1, and UGT85B1, in the dhurrin biosynthetic pathway and PP2A serving as a housekeeping gene. We hypothesis that dhurrin production is rapidly increased after germination and decreases once the seedling is around 4 weeks old.

4:30 – 4:45pm:

"COVID-19 Case Surveillance on a University Campus"

Student: Jarrod Woodland Faculty Mentor: Dr. Jennifer Lyles

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 was first identified in Wuhan, China in late 2019 but has since spread worldwide, resulting in an ongoing global pandemic. Strategic practices have been employed in an effort to control the spread of the virus, including vaccination, frequent testing, quarantine, isolation, contact tracing, mitigation strategies (such as masks and social

distancing), and case surveillance. A foundational principle of public health practice, case surveillance involves the collection of information about a case or individual diagnosed with a disease that poses a serious health risk to others, including COVID-19. This practice helps us to better understand diseases, including transmission, and determine appropriate actions to control the spread of the disease. Case surveillance is particularly important in large group settings, such as college campuses. While Francis Marion University (FMU)—consisting of nearly 5,000 students, faculty, and staff—has implemented many protective measures to maintain a safe learning environment on campus, case surveillance would further contribute to this mission by providing important information regarding the landscape of COVID-19 at FMU. Therefore, this study aims to implement case surveillance on campus by administering a survey to consenting individuals being tested for SARS-CoV-2 at the FMU Student Health Center. All survey data collected—including demographic information, vaccination status, symptoms, previous infection, underlying medical conditions, known exposures, residence, personal behaviors, social activities, and COVID-19 clinical diagnosis—are deidentified and analyzed using Qualtrics software. The results of this study may help to inform future preventative measures on campus as we move forward in this pandemic and can be translated to other institutions of similar size, demographics, and geographical location.

The Department of Biology at FMU strongly encourages student participation in research activities. We offer many opportunities for undergraduates to assist in faculty research or develop their own independent research projects. Students can earn academic credit through Special Studies (BIOL 497) and Honors Independent Study.

If you are interested in learning more about P.U.R.E. or available research opportunities, please visit our website at: http://people.fmarion.edu/tbarbeau/PURE_symposium.htm. You can also contact Dr. Barbeau (tbarbeau@fmarion.edu), the coordinator of P.U.R.E., to answer any questions you might have and get you started on a research project!