The Utica University Student Conference for Research, Professional Activities, and Creative Arts

Wednesday, April 26, 2023

Donahue Auditorium/Gordon Science Center

UTICA UNIVERSITY

SCHEDULE OF EVENTS

1:30 pm **Oral Presentation Set-up: presenters report to rooms**

2:00 pm **Welcoming Remarks – Provost Todd Pfannestiel**

2:15 - 3:00 pm **Poster Presentations & Refreshments – Donahue Auditorium (Gordon 167 & 1st floor hallway)**

3:00 – 4:15 pm **Concurrent Oral Presentations**
- **Session A: Gordon 261**
- **Session B: Gordon 262**
- **Session C: Gordon 271**

POSTER SESSION: 2:15 PM – Gordon Science Center, 1st floor

1. **Interest Groups and Healthcare: Comparing the United States and Canada**
   - Claudia Biernat (J.T. Kwon, Faculty Advisor)

2. **Synthesis and Characterization of Novel Nickel(II) Complexes as Precursors to [NiFe]-Hydrogenase Mimics**
   - Selmina Huskic (Elaine Liu, Faculty Advisor)

3. **Metal Nanoparticle Synthesis using Mint Leaf Extract**
   - Sara Muhic Zukic (Alyssa Thomas, Faculty Advisor)

4. **Machine Learning-based Object Detection of OTC Medications for Consumer Safety**
   - Neilani Mulalic (Angel Rivera, Faculty Advisor)

5. **Mouse Model to Elucidate Molecular Mechanisms of PGBD5**
   - Nathan Rice, Makiko Yamada, Luz Jubierre Zapater, Alex Kentsis (Adam Pack & Sarah Keesom, Faculty Advisors)

6. **Behavioral and Hormonal Responses by Planorbid Snails to Temporal Patterns of Predation Risk**
   - Morgan Rynkiewicz, Gillian Bradley, Sara Rachon, Katherine Hawley, and Alyssa Tyczka (Thomas McCarthy, Faculty Advisor)

7. **Historical Woody Plant Species Composition on an Urban University's Campus**
   - Adam Thomas, Sara Rachon, Chanel Chahfe, Sarah Sharpe, Hannah Stack (Sara Scanga, Faculty Advisor)

8. **Dietary intake of vitamins and risk of cancer mortality results from the Golestan Cohort Study**
   - Adriana Torres, Mohammad Hosein Yazdanpanah, Adriana Torres, Hossein Poustchi, Arash Etemadi, Farin Kamangar, Sanford M Dawsey, Christian C. Abnet, Reza Malekzadeh (Maryam Hashemian, Faculty Advisor)

SESSION A: Gordon 261

Moderator: **Sarah Keesom, Associate Professor of Biology**

3:00 - 3:15: **Red Maple Tree Phenology Is Not Affected by Light Pollution on an Urban University Campus**
- Andrey Akhremenko, Ariana Edmonson, Tania Fadhel, Kristina Kuts (Sara Scanga, Faculty Advisor)

3:15 - 3:30: **Inflammatory Transcriptome Analysis in PIK3CA-driven Vascular Malformations**
- Sara Muhic Zukic (Brandee Rockefeller, Faculty Advisor)

3:30 - 3:45: **An Assessment of Native Tree Species on Utica University's Campus from 1996 to 2023**
- Chanel Chahfe, Hannah Stack, Sara Rachon, Sarah Sharpe, Adam Thomas (Sara Scanga, Faculty Advisor)

3:45 - 4:00: **Transcriptome wide analysis of Lipid Metabolism Genes in PIK3CA-driven Vascular Malformations**
- Andrey Akhremenko (Brandee Rockefeller, Faculty Advisor)

4:00 - 4:15: **Measuring Nitrogen Isotopes with MALDI-TOF MST**
- Tara Smith (Julian Damashek, Faculty Advisor)

4:15 - 4:30: **Pregestational social deprivation and offspring cognition**
- Alexandra Lumley (Sarah Keesom, Faculty Advisor)

SESSION B: Gordon 262

Moderator: **Deborah Pollack, Assistant Professor of Psychology**

3:00 - 3:15: **Fostering Independence: Facilitating the Successful Transition to Adulthood through Life Skills Intervention**
- Megan Ball (Annmarie Kinsella, Faculty Advisor)

3:15 - 3:30: **The Importance of Physical Education**
- Robert Avery, Maximus Thomann (Margaret Hemstrought, Faculty Advisor)

3:30 - 3:45: **Representations of neurodivergence in the context of Whole Brain Emulation in "SOMA"**
- Michał Kozub (Christopher A. Riddle, Faculty Advisor)

3:45 - 4:00: **Stability of Supra Arcade Downflows (SADs) and Bursty Bulk Flows (BBFs): Differences, Similarities, and Effects on the Surrounding Regions**
- Isabelle LaBelle, Robert Orellano (Hava Turkakin, Faculty Advisor)

SESSION C: Gordon 271

Moderator: **Unnati Shah, Assistant Professor of Computer Science**

3:00 - 3:15: **Social Media Content Strategies of Fast Food Companies**
- Iryna Konoplianko (Pat Swann, Faculty Advisor)

3:15 - 3:30: **What does visiting Egypt as an international student at AUC look like?**
- Youssef Anwar (Elizabeth Nassar, Advisor)

3:30 - 3:45: **Effects of Social Media on Mental Health**
- Emily Dygert (Pat Swann, Faculty Advisor)

3:45 - 4:00: **Connections Between Fascism and Attacks on Queer People**
- Dylan Thompson (Daniel Tagliarina, Faculty Advisor)

ABSTRACTS

Transcriptome wide analysis of Lipid Metabolism Genes in PIK3CA-driven Vascular Malformations

Andrey Akhremenko
Prof. Brandee Rockefeller, Faculty Advisor
Oral Presentation

Blood vessels are lined by endothelial cells, which play a vital role in normal tissue development, growth, repair, and a variety of pathological contexts including cancer, cardiovascular disease, and diabetes. Angiogenesis is the process of new blood vessel formation, where endothelial cells sprout from pre-existing vasculature. Dysregulation of angiogenesis can manifest as vascular anomalies. Vascular anomalies are categorized as vascular tumors or vascular malformations. Our lab primarily focuses on vascular malformations, which can cause symptoms ranging from non-life-threatening cosmetic disfigurement to chronic inflammation, pain, swelling, and even mortality depending on the specific tissue location. A "hot spot" mutation in the oncogene PIK3CA was discovered as a driver in the majority of human vascular malformations. However, it is unclear at this time what the molecular mechanisms governing the formation and maintenance of these malformations is because PI3'Kinase activation is a regulator of proliferation, growth, migration, inflammation regulation, metabolism among others. Here we have focused on lipid metabolism. It is a good candidate because currently there is relatively little known about the role it plays in angiogenesis and pathological processes related to endothelial cells, outside of its association with cardiovascular disease. Changes in the fatty acid oxidation levels have been associated with cardiovascular problems in patients. Here we have analyzed mRNA transcriptomes from control and PIK3CAH1047R mutant endothelial cells in angiogenesis assays. We found many genes related to lipid metabolism are significantly dysregulated. These data will help us gain a better understanding of lipid metabolism in normal and pathological endothelial cells.

Red Maple Tree Phenology Is Not Affected by Light Pollution on an Urban University Campus

Andrey Akhremenko, Ariana Edmonson, Tania Fadhel, Kristina Kuts
Prof. Sara Scanga, Faculty Advisor

Oral Presentation

Artificial light at night (ALAN) causes light pollution around the world and is expected to continue intensifying. Plants need daytime light to conduct the photosynthesis required for their growth, development, and reproduction, but it is unclear how ALAN may affect these biological processes in plants. Previous studies have shown that ALAN disrupts plant circadian rhythms, growth, and phenology (i.e., timing of cyclical and seasonal biological events). Our research focus is on how ALAN affects the flowering phenology of Acer rubrum (red maple), a species of tree that has been shown to respond to ALAN in previous studies. We tested whether street and building light source density within 25 m of each tree affected red maple flower bloom timing. For 4 weeks we surveyed 21 red maples on the Utica University campus 3 times weekly to evaluate whether flowers were just beginning to bloom (phase 1 of blooming) or had visible flower stems (phase 2 of blooming). We found differences in flower bloom timing among the replicate trees on campus, demonstrating that individual trees were exhibiting differences in phenology. However, there was no significant correlation between the timing of flower bloom and light source density. Tree size and nighttime temperature near the trees were also not correlated with the timing of flower bloom. These findings indicate that phenological differences among individuals in an urban campus tree population are due to factors other than ALAN, ambient night time temperature, and tree size.

What Does Visiting Egypt as an International Student at AUC Look Like?

Youssef Anwar
Ms. Elizabeth Nassar, Advisor

Oral Presentation

Do you want to have a unique experience while studying abroad in one of the most famous countries in the middle east? Join me in this presentation where I, an Egyptian student studying at Utica University, give a glimpse of the experience you would get there!

The Importance of Physical Education

Robert Avery, Maximus Thomann
Prof. Margaret Hemstrought, Faculty Advisor

Oral Presentation

Physical education is a subject area that is often marginalized in schools for many reasons despite its significant benefits that last a lifetime. Presenters will advocate for the role that physical education plays and how it impacts students in and out of the classroom. The effects it has on our physical, mental, and cognitive health, plus why it's important now more than ever, will also be discussed.

Fostering Independence: Facilitating the Successful Transition to Adulthood through Life Skills Intervention

Megan Ball
Prof. Annmarie Kinsella, Faculty Advisor

Oral Presentation

Despite federal law mandates requiring all foster care agencies to provide independent living services to youth before transitioning out of foster care, data from the National Youth in Transition Database demonstrates considerable variations among foster youth participation (Liu, 2020). Without the opportunity to access and participate in programs to acquire and master the life skills needed for successful independent living, youth are exiting the foster care system with significant needs unmet. This evidence-based project sought to answer the following question, "What impact does life skills intervention, provided in group format, have on the transition readiness of adolescent foster youth receiving services through Mohawk Valley Psychiatric Center – Pinefield Children and Youth in Utica, NY?" Thirteen youth ages 14 to 17 years receiving intensive, inpatient mental health services at MVPC-PCY participated in this evidence-based project. Youth engaged in six, two hour life skills modules held within the group setting. A modified version of the Casey Life Skills Assessment was utilized to measure transition readiness at baseline and after completion of the program. Descriptive statistics and one-tailed paired t tests were completed to determine if statically significant changes in life skills development were achieved. Participation in the Fostering Independence Life Skills Program produced statistically significant changes in life skills development for all thirteen youth individually (overall scores all $p < .001$) and as a group (overall score $p < .001$). The findings of this evidence-based project confirm that building life skills in the early years of life may help foster youth navigate their social and emotional challenges during adolescence and ease the transition to adulthood. Further research is needed to confirm or refute these findings.

Interest Groups and Healthcare: Comparing the United States and Canada

Claudia Biernat
Prof. JT Kwon, Faculty Advisor

Poster Presentation

The United States and Canada share a common culture, regime, religion, economy, and continent but have two very different healthcare systems. The United States has a hybrid system of government and employer-based healthcare. Canada, however, has a universal healthcare system in which healthcare is provided solely by the government. How can such similar countries have vastly different healthcare systems? Well, both countries have different lobbying systems. In Canada, interest groups are highly regulated and require government approval. I theorize that the strength and power of interest groups is why the United States and Canada have different healthcare systems. Furthermore, I hypothesize that the United States has a hybrid healthcare system while Canada has a universal healthcare system because there are more healthcare lobbyist groups in the United States than Canada. The healthcare interest groups in the United States prevent America from shifting to a universal healthcare system. The lack of healthcare interest groups in Canada allowed for them to adopt a universal healthcare system without significant pushback. Furthermore, in the United States, interest groups are less strictly regulated and are much easier to create than in Canada. Using a Most-Similar-System-Design research model, I found that the United States and Canada, in addition to having very different healthcare systems, also have very different regulations on lobbying and a significant difference in the amount and power of healthcare interest groups.

An Assessment of Native Tree Species on Utica University's Campus from 1996 to 2023

Chanel Chahfe, Hannah Stack, Sara Rachon, Sarah Sharpe, Adam Thomas
Prof. Sara Scanga, Faculty Advisor

Oral Presentation

Incorporating native species into landscape design can have positive effects on species interactions like pollination. We wanted to evaluate whether Utica University has incorporated mostly native or non-native trees into its landscape design, and whether the proportion of native trees has changed over time. An internal 1996 report provided a full inventory of the location and identification of every tree on Utica University's campus. Using this report, we calculated the percent of native (%n) versus non-native trees on campus in 1996, and compared it to the %n in 2023. The 2023 data were obtained by subsampling the campus at equal intervals along randomized transects, at 11 10m2 circular plots, in which we identified each tree to species. We compared the data from 1996 to 2023 to discover how the %n has changed over time. We found that the percentage of native species did not significantly change from 1996 to 2023. We conclude that there is no significant difference in the Utica University campus native tree community from 1996 to the present day.

Effects of Social Media on Mental Health

Emily Dygert
Prof. Pat Swann, Faculty Advisor

Oral Presentation

This study provides a quantitative analysis of the effects of social media use. The purpose of this study was to find how social media affects users' mental health, self-esteem, body image, self-comparison, and the increase of cyberbullying. Also, researchers wanted to find out if social media had a negative or positive effect on most users.

After conducting a survey with 57 participants, it was found that social media has a positive and negative effect on most users. It was also found that most of the participants experienced feelings of anxiousness, depression, jealousy, and cyberbullying due to using social media. It was also found that users have felt feelings of sadness and hopelessness, worthlessness, thoughts of self-harm, sleep deprivation or insomnia, reduced or increased appetite, and stress caused by social media. Researchers found that the amount of time spent on social media does lead to a more negative experience for users. Also, when users use social media for "fun," they are more likely to experience mental health issues. Whereas if they use social media to connect with family and friends, they tend to not experience depression or anxiety.

This study was done to gain awareness of the mental health crisis social media has been causing in society. This research can be used to prove that users of social media, especially younger generations, need professional help or even ways to healthily cope. The damage social media has caused to today's society is very detrimental and needs to be taken seriously.

Synthesis and Characterization of Novel Nickel(II) Complexes as Precursors to [NiFe]-Hydrogenase Mimics

Selmina Huskic
Prof. Elaine Liu, Faculty Advisor

Poster Presentation

Because of the pressing need for sustainable energy sources, H_2 has received increased attention as an environmentally benign energy source. Hydrogenases, metalloenzymes that catalyze the reversible oxidation of H_2, are ubiquitous throughout nature. However, synthetic efforts to replicate hydrogenases have struggled with low efficiency, short life spans, and the need for high catalyst loading. This arises, in part, because of the limited understanding of the enzymatic mechanism. The mechanism of [NiFe]-hydrogenase, the most prevalent family of hydrogenases in nature, has been the focus of significant research efforts since the crystallographic determination of the active site in 1995, however the understanding of metal center, in particular the role of the iron, remains poorly understood. It has been determined that the redox chemistry happens solely at the Ni-center, however the Fe-center is necessary. In previous synthetic systems, the Ni(II) precursor has shown limited catalytic activity compared to the Ni(II)-Fe(II) complex, while the Fe(II) precursor was catalytically inert, further demonstrating the important, yet secondary, role of the Fe-center. This poster will discuss the synthesis and characterization of a series of tetradentate sulfur ligands and their corresponding Ni(II) complexes as precursors for a series of [NiFe]-hydrogenase mimics. The reactivity of the Ni(II) complexes will also be discussed.

Social Media Content Strategies of Fast Food Companies

Iryna Konoplianko
Prof. Pat Swann, Faculty Advisor

Virtual Presentation

Research shows that fast food marketing in the food industry is an essential business activity. This research project looked at how audiences perceive the strategies that fast food companies use with social media to advertise fast food restaurants in the USA. The study was focused on the 90 participants and how they are influenced by fast food social media advertisements. A survey questionnaire asked consumers about fast food advertising on consumer behavior. The results of the survey: half of the participants 53.8 % prefer drive-thru, while 31.3 % online delivery and only 15% dine-in services demonstrated that food promotion plays an effective role in fast food promotion plans.

Representations of Neurodivergence in the Context of Whole Brain Emulation in "SOMA"

Michał Kozub
Prof. Christopher A. Riddle, Faculty Advisor

Oral Presentation

This paper focuses on ethical issues and the representation of disability and neurodivergence in the video game SOMA. The methods used are textual analysis of academic literature and close reading of the artifact of the game itself through its content, interviews with game developers and designers, and fan forums. A theoretical approach draws from Diane Carr's studies of the horror movie genre within the disability game studies paradigm and Christopher's Riddle reflections on equality and justice for neurodivergent minorities in the context of Whole Brain Emulation (WBE). The figure of the Monster is analyzed through the glitch aesthetic and its meaning in the context of the medium of the game and performance of playing. Experiences of disability and corporeality in the context of WBE are addressed in relation to Robert Nozick's 'experience machine' and Alan Watts's 'the dream of life'. Through textual analysis, it is found that SOMA embodies certain ideas of disability in the figure of the Monster as a means of evoking affect within the player. However, the story of Catherine Chun can be read as an affirmative representation of neurodivergent individuals.

Stability of Supra Arcade Downflows (SADs) and Bursty Bulk Flows (BBFs): Differences, Similarities, and Effects on the Surrounding Regions

Isabelle LaBelle, Robert Orellano
Prof. Hava Turkakin, Faculty Advisor

Oral Presentation

We examine the stability conditions for two post eruptive phenomena in two different regions of the solar -- terrestrial environment, namely Supra Arcade Downflows (SADs) in the solar corona and Bursty Bulk Flows (BBFs) in the Earth's magnetotail. We specifically investigate the possibility of Kelvin-Helmholtz Instability (KHI) and magnetohydrodynamic (MHD) wave emission along these two shear flow regions that have remarkably similar velocity profiles and length scales of ~ 1000 km. Our results suggest that the KHI and emission of propagating MHD waves due to KHI are possible along both SADs and BBFs, depending on the background values of the magnetic fields, densities, and shear flow speeds. These propagating MHD waves may be a means of energy transport out of SADs and may contribute to the transport of energy into the surrounding corona, perhaps contributing to solar coronal heating. Emission of MHD waves along BBF boundaries may have profound effects on the response in the near-Earth magnetotail, since the emission of magnetosound may transfer energy away from the BBF into the surrounding tail. This may influence the response of substorm-related phenomena in the near-Earth region, including particle injections and through magnetosphere-ionosphere coupling, introduce a possible relationship to the structure of auroral brightenings, and field aligned currents. Moreover, the reduction of the kinetic energy of the flows arising from the emission of MHD waves may contribute to the braking of the flows in SADs and BBFs.

Pregestational Social Deprivation and Offspring Cognition

Alexandra Lumley
Prof. Sarah Keesom, Faculty Advisor

Oral Presentation

During the COVID-19 pandemic, social distancing led to increased social isolation globally. While social distancing is effective at reducing the spread of disease, isolated individuals are at increased risk of anxiety, depression, and cognitive dysfunction. Although it is clear that social deprivation has negative impacts on isolated individuals, the transgenerational effects of reduced social interaction is underexplored. Thus, we conducted a study to investigate the effects of social isolation prior to gestation on the cognitive function of the offspring. To do this, we placed female mice into four housing treatments (n = 3 per category): short-term group (GR-ST), long-term group (GR-LT), short-term individual (IND-ST), and long-term individual (IND-LT). Female mice were then bred with male mice. Following this, we tested the hypothesis that social isolation prior to gestation impairs offspring cognitive function, as assessed by the novel object recognition test. Female offspring were from the following mothers: GR-LT (n = 4), IND-ST (n = 7), and IND-LT (n = 9). The test was conducted in stages: habituation, familiarization, and test. Investigation of a new versus familiar object during the test stage was quantified. GR-LT offspring spent more time investigating the new object, and IND-ST offspring had a slight preference for the new object. Interestingly, IND-LT offspring did not exhibit a consistent preference for the new object. Our preliminary results suggest that maternal social deprivation prior to conception has an impact on offspring cognition, adding to the growing literature suggesting that experiences prior to gestation have significant effects on the next generation.

Metal Nanoparticle Synthesis using Mint Leaf Extract

Sara Muhic Zukic
Prof. Alyssa Thomas, Faculty Advisor

Poster Presentation

Nanoparticles are particles under 100 nanometers with different chemical and physical properties compared to larger particles of the same nature. As such, they can be used in clinical research, cancer therapy, and gene delivery. The synthesis of gold, silver, and copper nanoparticles typically requires a reducing agent which reduces the metal ions to atoms while being oxidized in the process. These reducing agents can be acquired from different sources including plants. Plant leaf extracts can be used as a green chemistry alternative to traditional methods in order to reduce unwanted hazardous products. Data from our lab suggest that mint leaf extract can function as a reducing agent to generate silver and gold nanoparticles. Mint leaf extract and sodium citrate were chosen as reducing agents in order to investigate whether the extract alone would lead to nanoparticle formation. Compared to the control - water with mint leaf extract only, all trials using gold and silver salts resulted in synthesized nanoparticles except for trials using copper salts which were inconclusive. This data can offer a revolutionary approach to the applications of nanoparticles in fields like medicine by avoiding potential harmful byproducts associated with the usage of traditional reducing agents.

Inflammatory Transcriptome Analysis in PIK3CA-driven Vascular Malformations

Sara Muhic Zukic

Prof. Brandee Rockefeller, Faculty Advisor

Oral Presentation

Vascular Malformations are a group of pathologies characterized by abnormal vascular development. These lesions are commonly driven by mutations in the PIK3CA gene. PIK3CA mutations are also associated with a wide range of phenotypes including overgrowth syndromes such as CLOVES and Klippel Trenaunay syndrome as well as macrodactyly and cancer. Although not much is known about the exact molecular mechanisms behind the development of these malformations, clinical research has shown that Rapamycin (a potent mTOR inhibitor) provides significant clinical benefit. mTOR is a master regulator of cellular metabolism, transcription and translation, and immune response and maturation. Histological data from our lab suggests there is a significant immune response to the development of PIK3CAH1047R-driven vascular malformations in vivo, and in alignment with clinical data was dampened by Rapamycin treatment. In order to further investigate the role of inflammation in the development and maintenance of vascular malformations we analyzed transcriptomes from control and PIK3CAH1047R mutant endothelial cells in angiogenesis assays. We focused on inflammatory related genes and found several genes to be significantly dysregulated when compared to control. Our data propels of the field of vascular biology by providing a list of targeted genes for the focus of further investigation, both for their roles in normal angiogenesis, but also in a pathological context.

Machine Learning-based Object Detection of OTC Medications for Consumer Safety

Neilani Mulalic
Prof. Angel Rivera, Faculty Advisor

Poster Presentation

Over-the-counter (OTC) medications are widely used for the treatment of common illnesses, and are often readily available at drugstores and supermarkets. However, misusing or abusing OTC medications can have serious health consequences, and accurate identification of these medications is critical for ensuring patient safety. This project aims to develop an object detection model using TensorFlow for identifying over-the-counter medications by their drug name. The model will be trained on a dataset of images containing common OTC medications and their corresponding drug names. The COCO format will be used for organizing the dataset, and the TensorFlow Object Detection API will be used for building and training the model. The goal is to create a model that can accurately detect and identify different OTC medications by their drug name, enabling automated identification of medications in various settings. The use of machine learning in medication recognition and detection has the potential to improve medication safety by reducing the likelihood of errors in medication administration.

Mouse Model to Elucidate Molecular Mechanisms of PGBD5

Nathan Rice, Makiko Yamada, Luz Jubierre Zapater, Alex Kentsis
Prof. Adam Pack & Sarah Keesom, Faculty Advisor

Poster Presentation

Age-associated cancers are driven by the accumulation of somatic mutations, especially single nucleotide variants over time. However, in childhood tumors, large genomic rearrangements are predominantly observed. These rearrangements are possibly induced by transposases, which are enzymes that transpose genetic elements within the genome. PiggyBac Transposable Element Derived 5 (PGBD5) is a domesticated transposase and is expressed in numerous cancer types, including in childhood cancers. While it is required for normal brain development, it has shown to aid in the development of childhood cancers through oncogenic rearrangements by aberrant nuclease activity. The mechanisms behind PGBD5 functions in tumorigenesis and development are not well understood. We hypothesized that PGBD5 requires cofactors in order to function as an efficient nuclease. To test this, we generated transgenic mice that carry Pgbd5-Flag-HA-P2A-eGFP at the endogenous locus. This enables us to probe Pgbd5's in vivo interactors. In order to validate this line, we utilized immunofluorescence and western blots to detect expression of Pgbd5 in brain tissues. Further molecular work is needed to fully validate this line, however, our analysis provides evidence to its validity. In conclusion, this mouse model is a promising tool to analyze expression patterns and in vivo physical interactors of Pgbd5 in mice. This will uncover the molecular mechanisms of how PGBD5 functions in both development and PGBD5-mediated tumorigenesis. More importantly, this knowledge will facilitate improvement of childhood cancer treatments.

Behavioral and Hormonal Responses by Planorbid Snails to Temporal Patterns of Predation Risk

Morgan Rynkiewicz, Gillian Bradley, Sara Rachon, Katherine Hawley, and Alyssa Tyczka
Prof. Thomas McCarthy, Faculty Advisor

Poster Presentation

Planorbid snails have several distinct behavioral responses to chemical cues indicating predation risk. We used a 3x2 experimental design to compare snails' responses to levels of risk (3) and temporal variation (2). Cues simulating high predation risk were created using water mixed with injured snails, while low predation risk was simulated using both plain tap water and water from a tank of healthy snails. We predicted that when repeatedly exposed to the chemical stimulus at the same time every day, these responses would decline in frequency and intensity when compared with animals who experience the stimulus at random time intervals. As a measure of the stress response, we also predict that the corticosterone levels will be lower in individuals that had same-time exposure. Results show that snails switched from non-moving to moving significantly more often in crushed treatments than in water and uninjured treatments. There was no significant difference in corticosterone levels for chemical cue types or temporal patterns and no significant interaction effect. Snails also seem to move more in the variable time treatment than in the standard time treatment. This could indicate habituation to chemical cues when exposed to the chemical cues at the same time every day. Future work includes examining whether response rates change over the duration of the experiment and comparing standard and variable treatments. As well as, modifying the experiment by addition of crayfish scent as a chemical cue to add the context of predator type versus generalized predation risk.

Measuring Nitrogen Isotopes with MALDI-TOF MS

Tara Smith
Prof. Julian Damashek, Faculty Advisor

Oral Presentation

Nitrogen is a key component of Earth's biogeochemical cycles. In the nitrogen cycle, ammonia is oxidized to nitrite and then converted to nitrate by specialized bacteria. Measuring nitrification is important in understanding how nutrients cycle through aquatic and terrestrial ecosystems and the roles they play in those ecosystems. This can be done by analyzing the ratio of isotopes, 14N, and 15N. 15N is denser than 14N, making it easier to trace and measure than 14N. Measuring rates of nitrification is both time-consuming and costly. Using a matrix-assisted laser desorption ionization coupled with time of flight (MALDI-TOF) mass spectrophotometer (MS), measuring organic compounds such as nitrogen comes at little cost, and measurements are taken with high precision. To ensure the MALDI-TOF MS can measure 15N a matrix is needed. The matrix requires 10 mg/mL of alpha-cyano-4-hydroxy-cinnamic acid (CHCA) in a 50% acetonitrile +0.1% trifluoroacetic acid (TFA) solution, $0.5 \mu L$ of which is pipetted onto a well along with $0.5 \mu L$ of the water sample. This crystalizes the samples so the laser ionizes the molecules in the sample and turns them into charged ions. The charged ions are separated by their mass-to-charge ratio and detected by the Time-of-Flight mass analyzer. The purpose of this research is to establish a method using the MALDI-TOF MS to create a set of standards with the 15N isotope to then measure unknown rates of nitrification in samples from across the Mohawk Valley Watershed, better to understand the role of nitrification in the surrounding ecosystems.

Historical Woody Plant Species Composition on an Urban University's Campus

Adam Thomas, Sara Rachon, Chanel Chahfe, Sarah Sharpe, Hannah Stack
Prof. Sara Scanga, Faculty Advisor

Poster Presentation

Campus green spaces allow for the intentional development of a plant community that can both benefit humans and serve as a hub for biodiversity. However, depending on species composition, these areas also can contribute to the spread of invasive species into local habitats. We used unpublished 1996 landscape maps created by Utica University Professor Emeritus David Moore to identify and quantify the woody plants that were historically present on campus, and then categorized each species as native, introduced (i.e., non-native but non-invasive), or invasive. Although species richness was high on campus (n=107), species evenness was quite low. Of the 1081 individual woody plants on campus in 1996, 49% were composed of just 5 species, and 64% of the species were represented by <5 individuals. Native (n=43) and introduced (n=49) species comprised the largest portion of the campus's species richness and only 5 of the 107 species found on campus were invasive. Similarly, invasive species only accounted for 6% of the total number of individuals (n=61) with the dominant invasive species being Euonymus alatus (Burning Bush; n=46). These results indicate that Utica University historically selected woody plant species that were either native or relatively innocuous to local ecosystems, resulting in a woody plant composition that was mostly non-invasive. The future direction of this project is to compare the woody plant composition on the present-day campus to the composition in 1996, to better understand how plant communities can shift in a human-controlled ecosystem.

Connections Between Fascism and Attacks on Queer People

Dylan Thompson
Prof. Daniel Tagliarina, Faculty Advisor

Oral Presentation

At the beginning of December 2022, the United States Department of Homeland Security warned of a likely increase in attacks on LGBTQ+ people. This comes in the wake of several attacks against drag shows using the premise that drag queens are a danger to children. This comes in the wake of several attacks against drag shows. The language demonstrates a professed interest in protecting children from the perceived threat of queer people. Despite this claimed interest, the numbers disagree that queer people are a physical threat. Next, I explore the parallels between the rhetoric used now and that used by Nazis in the 1930s and 1940s. Nazi rhetoric similarly depicts queer people as a threat. Both groups see queer people, especially drag queens and trans people, as challenging their idea of masculinity. The rhetoric that both groups use is consistent with toxic ideas of masculinity. Those that engage in authoritarian rhetoric historically and currently explicitly target queer people because of the threat that authoritarians perceive to their ideology. Toxic masculinity is a threat to queer people.

Dietary intake of vitamins and risk of cancer mortality results from the Golestan Cohort Study

Adriana Torres, Mohammad Hosein Yazdanpanah, Adriana Torres, Hossein Poustchi, Arash Etemadi, Farin Kamangar, Sanford M Dawsey, Christian C. Abnet, Reza Malekzadeh
Prof. Maryam Hashemian, Faculty Advisor

Poster Presentation

Background: The associations between vitamin deficiency and gastrointestinal (GI) cancer mortality are not fully understood. This study evaluated the association between vitamin intakes including vitamins A, B, C, K, and β-carotene and GI cancers mortality in a prospective study in a Middle Eastern population. Methods: We used data from the Golestan Cohort Study, which followed participants aged 40-75 years since 2004. We excluded subjects reporting extreme intakes of total energy and a positive history of cancer, CVD, or diabetes at baseline. Vitamin intake was estimated from the baseline food frequency questionnaire. We used Cox proportional hazards models to estimate hazard ratios (HR) and 95% confidence intervals (CI) for mortality using the lowest quintile of intake as a reference group for each vitamin with adjustment for potential confounders. We also assessed linear associations per half of an interquartile range as a unit. Results: We analyzed 42,456 subjects that had a mean age of 51.56+8.79 years at baseline. During 579,339 person-years of follow-up, 945 (2.22%) GI cancer deaths were recorded. We observed a significant inverse association between vitamin A (HR Q5 vs Q1=0.73, 95% CI=0.59-0.92), β-carotene (HR Q5 vs Q1=0.75, 95% CI=0.59-0.96) with total GI cancers (Ptrend<0.05). β-carotene is also associated inversely with esophageal cancer mortality (HR Q5 vs Q1=0.69, 95% CI=0.43-1.11, Ptrend<0.05). Also, a significant inverse association between riboflavin (HR Q5 vs Q1=0.31, 95% CI=0.11-0.85) and pancreatic cancer mortality were observed (Ptrend<0.05) in the fully adjusted model. Other vitamins such as vitamin C, K, and other B vitamins did not indicate a significant association with GI cancer mortality. Moreover, the HRs of cancer mortality per one-unit increase in vitamin intake were not significant. Conclusion: These findings suggest that dietary intake of β-carotene and vitamin A were inversely associated with GI cancer mortality. Moreover, β-carotene and riboflavin intake showed a significant inverse association with esophageal and pancreatic cancer mortality, respectively. Further confirmation in larger studies and in meta-analySes is needed.

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