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# The 18th Annual Undergraduate Student Scholarship and Creative Endeavors Day

April 18, 2023

This year's scholars day includes 90 students, representing 17 different areas of study. Congratulations to these student-scholars for all of their accomplishments, and many thanks to their 25 faculty sponsors.

Since the inception of Scholars Day 17 years ago, 1,211 students have shared their scholarly work with the Moravian University community.

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## Schedule of the Day

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|---|---|
| 11:00 a.m. | **Welcome and Opening Remarks**<br>*Haupert Union Building, UBC Room* |
| 11:00 a.m. – 12:15 p.m. | **Session I: Oral Presentations**<br>*Haupert Union Building, UBC Room* |
| 12:00 p.m. – 1:00 p.m. | **Student Poster Presentations I**<br>*Haupert Union Building, Gallery Walls* |
| 12:30 p.m. – 2:05 p.m. | **Session II: Oral Presentations**<br>*Haupert Union Building, UBC Room* |
| 3:30 p.m. – 4:25 p.m. | **Session III: Oral Presentations**<br>*Haupert Union Building, Air Products Room* |
| 4:00 p.m. – 5:00 p.m. | **Student Poster Presentations II**<br>*PPHAC Atrium* |

**4:00 p.m. Reception (all welcome), PPHAC ATRIUM**

# Acknowledgements

**The 18th Annual Moravian University Undergraduate Student Scholarship and Creative Endeavors Day would not have been possible without the commitment of many people at Moravian University.**

**In addition to all of the participating students and faculty listed in this program and all other faculty and students who collaborated on research projects this year, we would like to acknowledge the contributions of the following individuals and offices:**

Rokke Endowment for Student Research

SOAR Program

Moravian University Honors Program

HUB Management Staff

Cory Dieterly, Archivist and Assistant to the Library Director

Food Services and Facilities Management

Mathematics Program

Jennifer McKinley, Secretary for the Psychology Department, and Laurie Lafurge, Secretary for the Mathematics and Computer Science Department

# The 18th Annual Moravian University Undergraduate Student Scholarship and Creative Endeavors Day

## Program Overview

Note: Please try to attend each oral presentation session in its entirety.

## SESSION I

Oral Presentations
Session I: Moderator - Dr. Kelly Krieble
HUB: UBC Room

| | | | |
|---|---|---|---|
| 11:00 AM | Geoffrey Kleinberg | Mathematics | Dr. Shannon Talbott |
| | *Differential Equations on Path Algebras* | | |
| 11:20 AM | Victoria Samuels | Statistics | Dr. Brenna Curley |
| | *Linear Regression Measurement Error Model: Applications with Added Sugar Intake* | | |
| 11:40 AM | Aidan Malloy | Physics | Dr. Kelly Krieble |
| | *A Study of the Effects of Particle Mass and Friction in Avalanches of Granular Piles* | | |
| 12:00 PM | Cielo Disla | Biological Sciences | Dr. Daniel Proud |
| | *Systematic Revisions of Cosmetid Harvestman (Opiliones: Laniatores: Cosmetidae) in the Caribbean Islands* | | |

## SESSION II

Oral Presentations
Session II: Moderator - Dr. Monica Kaniamattam
HUB: UBC Room

| | | | |
|---|---|---|---|
| 12:30 PM | Alexa Van Doren, Lindsey Rapp, Carly Pyatt, Samantha Silliman | Health Science | Dr. Monica Kaniamattam |
| | *Exploring the Importance of Advocating for the Mental Wellness of People with Hearing Loss* | | |
| 12:50 PM | Mary Mountain, Rosina Symia, Kelsey Hollenbach, Kaleigh Weber | Health Science | Dr. Monica Kaniamattam |
| | *Age-Related Hearing Loss and Hearing Healthcare Access* | | |
| 1:10 PM | Sierra Drey, Maura Berecin, Reagan Bonforte | Health Science | Dr. Monica Kaniamattam |
| | *Role of Social Participation and Hearing Management in Healthy Aging* | | |
| 1:30 PM | Rachael Shaffer, Christina Carty, Ronald Evans, Barbara Yurchishin | Health Science | Dr. Monica Kaniamattam |
| | *Effect of Hearing Loss on Music Majors: A Case Study* | | |
| 1:50 PM | Natasha Katchur, Amanda Aloia, Rachel Kelly | Health Science | Dr. Monica Kaniamattam |
| | *Psychosocial Impacts of Unilateral Hearing Loss in Older Adults* | | |

# SESSION III

Oral Presentations
Session III: Moderator - Dr. Axel Hildebrandt
HUB: Air Products Room

| | | | |
|---|---|---|---|
| 3:30 PM | Brian Utzat | Modern Languages and Literatures, Economics | Drs. Axel Hildebrandt and Eva Marikova Leeds |
| | *The Impact of COVID-19 Policies in Germany and the United States* | | |
| 3:50 PM | Nathan Pynchon | Modern Languages and Literatures | Dr. Claudia Mesa |
| | *Contradictions in Faith: Christianity's Use in "The Interesting Narrative of the Life of Olaudah Equiano, or Gustavus Vassa, the African Written by Himself" (1789)* | | |
| 4:10 PM | Sophia Shienvold | Biochemistry | Drs. Anastasia Thévenin and Shari Dunham |
| | *Levels of Cytotoxic Rhodium and Platinum Compounds in Select Organelles within HeLa Cancer Cells* | | |

# POSTER SESSION I

12:00 PM - 1:00 PM
Poster Presentations I
HUB

| Students | | Advisor |
|---|---|---|
| Helaena Holjes<br>*Tolerance of American Elm to Urban Pollutants* | Environmental Science | Dr. Natasha Woods |
| Tyler Nemura<br>*Saltwater Inundation Reduces Zea mays Growth* | Environmental Science | Dr. Natasha Woods |
| Gabrielle Demchak, Kristian Wolf, Stefano Garofalo<br>*Generalizations of Toggle on Cycles* | Mathematics | Dr. Nathan Shank |
| Gabrielle Demchak<br>*Network Reliability Parameters* | Mathematics | Dr. Nathan Shank |
| Emma A. Yanowsky<br>*Canine Influence on Human Biological Processes During Meditation* | Psychology | Dr. Bob Brill |
| Madeline Underwood, Christina Awwad<br>*Delta-8 THC in Hemp Products* | Chemistry | Dr. Alison Holliday |
| Calum Taft-Lockard, Hannah Kolonoski, Adelaide Treibley, Harrison Krauss<br>*Modular Magic Sudoku* | Mathematics | Dr. Nathan Shank |
| Grainne Schroeder<br>*Effects of Breathing and Self-Compassion on Well-Being* | Psychology | Dr. Bob Brill |
| Rikki Jo McRae, Hailey Hoffman, Dwight Holloway<br>*Come to the Dark Side, Its Cooler: Comparing Thermal Ecology Readings Between Secondary Rainforests and Man Made Clearings* | Biological Sciences | Dr. Sara McClelland |
| Alondra Cortes, Ebony Saccento, Maria Rosario<br>*The Thermal Ecology of Agar Frog Models in Different Microhabitats.* | Biological Sciences | Dr. Sara McClelland |
| Jacob Freeh<br>*The Effect of the Antioxidant, Curcumin, on a B. thailandensis infection model in macrophages.* | Biological Sciences | Dr. Kara Mosovsky |
| Ashley Hercik, Emily Miller, Anthony Disipio<br>*Impacts of Color Morph and Habitat on Frog Body Temperature in a Tropical Location Using Agar Frog Models* | Biological Sciences | Dr. Sara McClelland |

| | | |
|---|---|---|
| Scott Kornfeind<br>*The Fate of Microplastics in Anuran Larvae* | Biological Sciences | Dr. Sara McClelland |
| Gwen Kester<br>*DNA and Protein Binding Kinetics of Novel Dirhodium Complexes* | Biochemistry | Dr. Shari Dunham |
| Luke Assande<br>*The Effect of Visual and Verbal Working Memory Factors on Time Perception* | Psychology | Dr. Sarah Johnson |
| Jack Wagner<br>*Moravian Cheese Hounds* | Computer Science | Dr. Jeffrey Bush |
| Hayley Carroll<br>*Molecular Analysis of Drosophila Seizure Mutations* | Biological Sciences | Dr. Christopher Jones |
| Aidan Malloy, Braden Kirkpatrick, Yousuf Kanan<br>*A Study of Solo Chess and Strategies for Solvability* | Mathematics | Dr. Nathan Shank |
| Maria Rabih<br>*Identifying Rhodium Binding Sites on Serum Albumin* | Chemistry | Dr. Shari Dunham |
| Lila Shokr<br>*Fables: An Experience* | Graphic and Interactive Design | Camille Murphy |
| Riley Masten<br>*Scientific Illustration of Cosmetidae of Cuba* | Biological Sciences | Dr. Daniel Proud |
| Melody Fermin<br>*Studying the diversity of Cosmetidae (Opiliones: Laniatores) in the Dominican Republic* | Biological Sciences | Dr. Daniel Proud |
| Brooke Coonrod<br>*Understanding the Mechanism of Seleno-L-Methionine protection of Burkholderia-infected Macrophages* | Biological Sciences | Dr. Kara Mosovsky |

# POSTER SESSION II

4:00 PM - 5:00 PM
Poster Presentations II
PPHAC Atrium

| Students | | Advisor |
|---|---|---|
| Helen Meckstroth<br>*Social Media Usage and Levels of Consumerism of College Students in the United States* | Sociology and Anthropology | Dr. Adams O'Connell |
| Vanessa Gabovitz<br>*A Slice of Moravian's History* | Biological Sciences | Dr. Natasha Woods |
| Jillian Connelly<br>*Predator Avoidance Behavior in Grass Shrimp* | Biological Sciences | Dr. Joshua Lord |
| Heather Adams, Evan Bulette, Victoria Samuels, Victoria Harper<br>*Gobblet* | Mathematics | Dr. Nathan Shank |
| Hailey Hoffman<br>*Impact of Ocean Acidification on the Foraging Behavior of Mud Snails* | Biological Sciences | Dr. Joshua Lord |
| Ayleen Mexquititla<br>*Selfish Shellfish: Shelter Sharing in Grass Shrimp (Palaemon pugio)* | Biological Sciences | Dr. Joshua Lord |
| Chad Propst<br>*Titanocene(III) Catalyzed Radical Arylation of Diphenyl Amino Epoxides with Electronically Different Substituents* | Chemistry | Dr. Godfred Fianu |
| Isabelly Silva<br>*Fishy Behavior in Shrimp: Shelter Use and Predator Harassment in Grass Shrimp* | Biological Sciences | Dr. Joshua Lord |
| Ashley Hutchison<br>*Effect of Ocean Acidification on Grass Shrimp Feeding Behavior* | Biological Sciences | Dr. Joshua Lord |
| Elizabeth Jones<br>*Ester hydrosilylations via a titanocene borohydride-PMHS reagent system* | Chemistry | Dr. Godfred Fianu |
| Mahum Naveed<br>*Students Attitudes towards Poverty Before and After a Poverty Simulation at Moravian University in 2022* | Public Health | Dr. Colleen Payton |
| Rachael Shaffer<br>*Speech-Language Pathology and Music Therapy: An Exploration of Collaboration* | Health Science | Dr. Eric Sanders |
| Nicholas Petrisko | Biological Sciences | Dr. Natasha Woods |

*Does Competition Reduce Salt Tolerance in Cereal Grasses?*

Bianca Rodriguez — Biological Sciences — Dr. Joshua Lord
*Group Foraging Behavior of Mud Snails (Ilyanassa obsoleta)*

Cristina Merone — Psychology — Dr. Bob Brill
*The Effects of Mental Health & Wellness Courses on College Students' Mental Health*

Emily Wells — Biochemistry — Dr. Anastasia Thévenin
*Understanding the Role of PTEN in Src Recruitment and Inhibition by Cx43*

Andreh Abdou, Lizzie O'Donnell, Garrison Koch, William Reinert — Mathematics — Dr. Nathan Shank
*On Properties of Minefield Pathing*

Rebecca Skibo — Chemistry — Dr. Stephen Dunham
*Synthesis of Novel Hydrophobic Dirhodium Compounds*

Jonathan Hixson-Cooper — Chemistry — Dr. Godfred Fianu
*Reduction of Nitriles to Amines Using a Titanocene Borohydride-PMHS Reagent System*

Gia LaSalle — Chemistry — Dr. Godfred Fianu
*Synthesis of Esters for Titanocene(III) borohydride-PMHS Hydrosilylations*

Victoria Donovan — Biochemistry — Dr. Anastasia Thévenin
*Analyses of PTEN Phosphatase Activity Toward Connexin 43*

Michel Issa — Chemistry — Dr. Godfred Fianu
*Epoxide Synthesis for Titanocene(III)- Catalyzed Radical Arylation Reactions*

Allison Dougherty — Psychology — Dr. Sarah Johnson
*The Influence of Colored Light on Test Anxiety*

Brianna Whalen — Modern Languages and Literatures — Dr. Claudia Mesa
*Wide Open Spaces: Borders, Boundaries and Identity in "Sin Nombre"*

Delanie Crabtree — Biological Sciences and Neuroscience — Dr. Sara McClelland
*Environmentally Realistic Levels of a Common Pesticide Causes Changes to Larval Behavior and Brain Morphology in an Amphibian Mode*

Lauren Latchford — Biochemistry — Dr. Anastasia Thévenin
*Map Kinase Story*

Kassandra Alicea — Biochemistry — Dr. Stephen Dunham
*Probing DNA-Binding Sites of Novel Rhodium Complexes Through Mass Spectrometry*

# Student Oral Presentations I
## HUB: UBC Room
## 11:00 AM – 12:15 PM

### Moderator: Dr. Kelly Krieble

**Title:** **Differential Equations on Path Algebras**
Students: Geoffrey Kleinberg
Advisor: Dr. Shannon Talbott
Location: UBC Room 11:00 AM - 11:15 AM

*A differential equation is an equation that is solved for an unknown Y and is expressed in terms of derivatives of Y. A path algebra is a mathematical structure that stems from a combination of abstract algebra and graph theory. In this talk, I will discuss my independent research in which I worked with a differential equation that has solutions in path algebras. I will also talk about restrictions on the possible inputs to the equation and why those limitations exist in terms of the path algebra.*

**Title:** **Linear Regression Measurement Error Model: Applications with Added Sugar Intake**
Students: Victoria Samuels
Advisor: Dr. Brenna Curley
Location: UBC Room 11:20 AM - 11:35 AM

*Research on health has become increasingly important as individuals have become more focused on eating healthier and exercising more. Reducing the amount of added sugars that people intake on a daily basis is one way that they are trying to achieve a healthier lifestyle because increased added sugar intake has been linked to obesity, diabetes, and heart disease. In this work, we investigate the relationship between added sugars and nutrient intakes for school-aged children (6-12 year olds) to see whether consuming more added sugars affects, or displaces, recommended nutrients. For our application, we analyze data from the National Health and Nutrition Examination Survey (NHANES) and the Food Pattern Equivalents Database (FPED) from 2017-2018. To investigate the relationship between added sugars and various nutrients, we fit a linear regression measurement error model that accounts for the day-to-day error in intake for both the independent and dependent variables. As part of this work, we also propose different estimators and compare their precision and accuracy via a simulation.*

**Title:** **A Study of the Effects of Particle Mass and Friction in Avalanches of Granular Piles**
Students: Aidan Malloy
Advisor: Dr. Kelly Krieble
Location: UBC Room 11:40 AM - 11:55 AM

*Granular Materials - a loosely interacting collection of solid particles - represents a class of materials that have undergone recent study. Such materials can often be used to model complex phenomena such as avalanches, earthquakes, and food storage/transport. We present research on granular materials which studies the dynamics of a sandpile - modelled by a system composed of small, uniform, spherical pellets - as it is built up and experiences avalanches at a critical state. These avalanches are measured and analyzed in terms of their magnitude, as well as their frequency distribution, as a function of pellet mass and interparticle friction.*

**Title:** **Systematic Revisions of Cosmetid Harvestman (Opiliones: Laniatores: Cosmetidae) in the Caribbean Islands**
Students: Cielo Disla
Advisor: Dr. Daniel Proud
Location: UBC Room 12:00 PM - 12:15 PM

*With more than 6,650 species described worldwide, Opiliones (daddy longlegs or harvestmen) represent the third largest order of arachnids. Endemic to the Neotropics, the family Cosmetidae contains more than 700 species of harvestmen. Although it is the second largest family of harvestmen, an antiquated classification system and the lack of a family-wide systematic study have made it difficult for researchers to study these animals. Using morphological and molecular data, we evaluated the relationships of Cosmetidae in several Caribbean islands (e.g., Puerto Rico, Cuba, Jamaica) to better understand their evolutionary relationships. We identify new characteristics that can be used to organize them into genera. In our molecular phylogenetic analysis, we recovered two distinct clades (genera) that occur in Puerto Rico. We describe a new genus that includes three species; of those, we describe one new species and redescribe another that was previously included in Paecilaema. Additionally, in Cuba, species belonging to several different genera were recovered as a monophyletic group. This work enables us to propose several systematic revisions of island lineages. We examine the morphological characters that are useful in diagnosing cosmetid genera and discuss the importance of an integrative approach to taxonomic studies within this family.*

## Student Oral Presentations II
## HUB: UBC Room
## 12:30 – 2:05 PM

### Moderator: Dr. Monica Kaniamattam

**Title:** **Exploring the Importance of Advocating for the Mental Wellness of People with Hearing Loss**
Students: Alexa Van Doren, Lindsey Rapp, Carly Pyatt, Samantha Silliman
Advisor: Dr. Monica Kaniamattam
Location: UBC Room 12:30 PM - 12:45 PM

*Hearing loss often has a negative effect on an individual's mental well-being. These effects can include social isolation, anxiety, depression, and other mental health problems. Studies indicate that people with normal hearing may not be fully aware of the impact and consequences of hearing loss. Future healthcare professionals have an essential role to play in advocating for these individuals and enhancing their mental well-being. Educating the community about hearing loss and its impact on mental health is crucial.*
*A 60-year-old female who wears a cochlear implant and a hearing aid was interviewed to gain a better understanding of what it is like to live with hearing loss. Through our interview with the participant, we gained a deeper insight and appreciation of the importance of advocacy for individuals with hearing loss. This presentation will highlight the activity limitations and participation restrictions that our interviewee had to deal with in her everyday life due to multiple environmental and personal barriers. There will also be an emphasis on her struggle with mental health and her advice on how to advocate for the hard-of-hearing community as a whole.*

**Title:** **Age-Related Hearing Loss and Hearing Healthcare Access**
Students: Mary Mountain, Rosina Symia, Kelsey Hollenbach, Kaleigh Weber
Advisor: Dr. Monica Kaniamattam
Location: UBC Room 12:50 PM - 1:05 PM

*Age-related hearing loss, also termed as Presbycusis, impacts communication abilities of many individuals. This project focuses on the barriers that individuals with Presbycusis face, as well as strategies on how to adapt communication practices. This project was inspired by a woman who has acquired sensorineural hearing loss due to age. While interviewing this woman, we documented her experiences with the challenges of receiving hearing aids, as well as the communication difficulties that remain even though she now has hearing aids. Individuals with hearing loss tend to face difficulties affording hearing aids. Hearing aids provide many benefits to help an individual with hearing loss be able to continue to participate in society, however, there are specific factors that hearing aids are unable to combat. Even with hearing aids, the women we based our project on, noted additional communication barriers that have forced her to no longer participate in activities that she once enjoyed. Learning specific strategies, and spreading awareness of Presbycusis, can improve communication between individuals with hearing loss and their communication partners.*

**Title:** **Role of Social Participation and Hearing Management in Healthy Aging**
Students: Sierra Drey, Maura Berecin, Reagan Bonforte
Advisor: Dr. Monica Kaniamattam
Location: UBC Room 1:10 PM - 1:25 PM

*Social participation and interpersonal interactions are vital components of healthy aging. Several studies indicate that diseases, mortality, and quality of life of the elderly are related to their social participation. The frequency and type of activities carried out by older adults with hearing loss and other communication disorders are reported to be substantially less when compared with those who do not have hearing loss and other communication disorders. As part of our class project, we interacted with an 85-year-old woman with hearing loss and suspected aphasia. Our participant talked about the ways in which she is able to maintain friendships and stay active, as well as about some unique challenges she faces as a result of having a disability in her ability to participate actively in her community. In our presentation, we will illustrate some engaged coping responses (like getting hearing aids and learning lip reading), various communication strategies used, and disengaged coping responses (like withdrawing from others) used by our participants. An emphasis will be placed on the use of auditory brain training to stimulate the cognitive and hearing skills of older adults and the importance of providing them with more social interaction opportunities within their communities.*

**Title:** **Effect of Hearing Loss on Music Majors: A Case Study**
Students: Rachael Shaffer, Christina Carty, Ronald Evans, Barbara Yurchishin
Advisor: Dr. Monica Kaniamattam
Location: UBC Room 1:30 PM - 1:45 PM

*Meniere's disease is a disorder of the inner ear characterized by intermittent tinnitus, a sense of pressure in the ear, vertigo, and progressive permanent hearing loss in one or both ears. A first-year college student with a focus on psychology and music, who developed hearing loss due to Meniere's disease was interviewed for a class project. Due to the low prevalence of Meniere's Disease in young adults, the opportunity to interview a young adult with the condition was a unique learning opportunity. During this presentation, we will discuss how hearing loss has an impact on this student's college performance and the unique accommodations, modifications, and coping strategies she uses to navigate music lessons, music performances, and live well with her hearing loss. Furthermore, we will provide an overview of (1) the unique challenges and adjustment options available on modern hearing aids for music perception and (2) the impact of frequency-specific hearing losses on musicians' performance. The importance of effective coping strategies and accommodations that college students can use to handle their hearing loss and achieve success will be highlighted.*

**Title:** **Psychosocial Impacts of Unilateral Hearing Loss in Older Adults**
Students: Natasha Katchur, Amanda Aloia, Rachel Kelly
Advisor: Dr. Monica Kaniamattam
Location: UBC Room 1:50 PM - 2:05 PM

*An older adult with sudden single-sided deafness (SSD) and progressive hearing loss in the other ear was interviewed for our class project. During our interaction, the participant shared her experiences in social settings with healthcare providers and how losing her hearing has altered her perception of self and others. Additionally, she discussed the ways in which she copes with her hearing loss and the strategies she uses to communicate more effectively with family members and friends, as well as her efforts to remain active in crowded public settings. Our presentation will focus on connecting what we learned from our patient interaction with common functional hearing difficulties associated with SSD, including impaired speech in background noise, reduced spatial awareness, impact on socialization, cognitive load on the brain and listening fatigue. The importance of facilitative and repair communication strategies and environmental management, and hearing assistive technology in minimizing communication difficulties and enhancing communication of older adults with hearing loss will be highlighted in this presentation.*

## Student Oral Presentations III
## HUB: Air Products Room
## 3:30 – 4:25 PM

### Moderator: Dr. Axel Hildebrandt

**Title:** **The Impact of COVID-19 Policies in Germany and the United States**
Students: Brian Utzat
Advisor: Drs. Axel Hildebrandt and Eva Marikova Leeds
Location: Air Products Room 3:30 PM - 3:45 PM

*At the start of the COVID-19 pandemic, Germany and the United States both experienced an economic decline, which was accompanied by rising unemployment rates. In this Honors Thesis, I examine the different economic policies adopted at the onset of the pandemic in Germany and the United States and their effect on the labor market. I argue that Germany's methods at preventing a large increase in unemployment was superior to the U.S. approach of allowing the unemployment rate to rise and providing cash and insurance payments to support their workers. I also assess the effects on German and U.S. employees of the corporation B. Braun during the pandemic.*

**Title:** **Contradictions in Faith: Christianity's Use in "The Interesting Narrative of the Life of Olaudah Equiano, or Gustavus Vassa, the African Written by Himself" (1789)**

Students: Nathan Pynchon
Advisor: Dr. Claudia Mesa
Location: Air Products Room 3:50 PM - 4:05 PM

*This essay explores how, in "Olaudah Equiano's Interesting Narrative" (1789), Christianity is used as a tool to persuade English parliament to abolish the transatlantic slave trade. I put forth in this argument that Equiano utilizes Biblical references to connect his Christian faith to that of his intended audience in order to demonstrate the disconnect between their actions and that of true Christians. Through comparing his experiences to those of Biblical narratives, Equiano forces readers to examine their own beliefs. During this process, readers are intended to discover that their actions (that of supporting, or permitting, slavery) are contrary to their mutual set of ideals, thus exposing the tension between their faith, both in theory and in practice.*

**Title:** **Levels of Cytotoxic Rhodium and Platinum Compounds in Select Organelles within HeLa Cancer Cells**

Students: Sophia Shienvold
Advisor: Drs. Anastasia Thévenin and Shari Dunham
Location: Air Products Room 4:10 PM - 4:25 PM

*Cisplatin, a well known and effective chemotherapy drug, has many undesirable side effects. Complexes of rhodium, which have similar properties to platinum, are being explored in our laboratory to determine whether they are as effective as cisplatin at killing cancer cells. We have tested the cytotoxic effects of two rhodium complexes, Rh2(butyrate)4 and Rh2(acetate)4, on HeLa cervical cancer cells, and we aim to determine how well and where these complexes enter and target. HeLa cells were treated with each compound, then bursted before rhodium and platinum levels were quantified by graphite furnace atomic absorption spectroscopy. The amount of compound in relation to the total protein concentration in the cell was quantified via BCA assays. Our studies of the whole cell lysates have been found to correlate to the IC50 values determined by our lab (lower IC50 equals higher toxicity). We are now isolating nuclei, and to ensure the nuclei are successfully isolated, Western Blotting analyses using c-Jun transcription factor as a nuclear marker and α-tubulin as a cytoplasmic marker have been performed. These studies will help to determine if the cytotoxicity levels of different rhodium complexes correlate with their ability to enter the cells and target specific organelles.*

# Student Poster Presentations I
## HUB Gallery
## 12:00 - 1:00 PM

**Title:** **Tolerance of American Elm to Urban Pollutants**
Students: Helaena Holjes
Advisor: Dr. Natasha Woods
Location: HUB Gallery

*Trees are planted along waterways in urban environments to filter pollutants before they contaminate local streams. American Elm, Ulmus americana, naturally has inhabited riparian zones and floodplains throughout the central and eastern regions of North America. American Elm along with other riparian species, filter pollutants before they negatively impact waterways. The planting of American Elm is advantageous due to the increased prevalence of impervious surfaces resulting from urban sprawl. City planners actively plant American Elm trees along waterways in urban environments to diminish pollutants from entering local streams. The ability of the American Elm to sequester pollutants can preserve the economic and social value of healthy waterways (e.g. fishing, boating, swimming).American Elm shows resilience against pollutants; however, it also has limitations to the amount of pollution it can tolerate. The current experiment tests three pollutants commonly found in urban environments, sediment, micro-plastics, and salinity. The purpose of this experiment was to determine the impact of these pollutants on the growth of American Elm seedlings. The results of this study can be used to better inform city planners of the impact that the built environment has on native species that are planted within the city.*

**Title:** **Saltwater Inundation Reduces Zea mays Growth**
Students: Tyler Nemura
Advisor: Dr. Natasha Woods
Location: HUB Gallery

*Sea level rise is increasingly becoming a threat to coastal communities and the agricultural industry. Farms are seasonally inundated with seawater, which causes low yield and low returns for farmers. To combat sea level rise more salt tolerant crops need to be identified. Corn (Zea mays) is a staple crop grown in North America. Previous research suggests that seedlings will be impacted by higher salinity, the maximum salinity corn can withstand during development is currently unknown. Previous research showed that the maximum salinity that seedlings can withstand is between 2 ppt and 5 ppt. The purpose of the current experiment is to determine the threshold within this 2-5 ppt range. Nine week old corn seedlings were exposed to 0 ppt, 2 ppt, 3 ppt, 4 ppt, and 5 ppt salinity for 8 weeks. The results show that 2 ppt is the maximum salinity that seedlings can withstand without experiencing decreases in yield. The treatment groups above 2 ppt experienced significantly decreased vertical growth relative to the control. Corn seedlings are highly sensitive to changes in salinity, other crops should be examined for salinity tolerance.*

**Title:** **Generalizations of Toggle on Cycles**
Students: Gabrielle Demchak, Kristian Wolf, Stefano Garofalo
Advisor: Dr. Nathan Shank
Location: HUB Gallery

*Lights Out is a game played on a 5x5 grid where a certain pattern of lights are on and there is a series of moves that will turn all the lights off. Our research takes rules from this game to motivate our project, Toggle. The standard toggle move says that once you hit a switch, the switch and all of its neighbors flip to the parity of either on or off. We plan to use the standard toggle move to attempt to generate patterns for all cycle graphs. Then we*

*want to move on to identifying patterns in cycle graphs with one cord. Once we can generalize for cycles, we would move into adding multiple cords until we get to complete graphs.*

**Title:** **Network Reliability Parameters**
Students: Gabrielle Demchak
Advisor: Dr. Nathan Shank
Location: HUB Gallery

*In this project, we studied the stability of networks represented by mathematical graphs that consist of n vertices and m edges. Specifically, we explored the Harary Index as a measure of network reliability. The Harary Index is defined as the sum of the reciprocal distances between all pairs of vertices in a graph and relates to its connectivity and diameter. We investigated the Harary Index of various graphs and graph classes, such as complete graphs, bipartite and m-partite graphs, cycles, paths, and binary trees. Our focus, however, was on how this index changed when a graph was altered through single edge-removal. Intuitively, we say that a larger change in this index when an edge is removed implies that the graph is less stable.*

**Title:** **Canine Influence on Human Biological Processes During Meditation**
Students: Emma A. Yanowsky
Advisor: Dr. Bob Brill
Location: HUB Gallery

*The purpose of this study aimed to determine the influence a canine engaging in deep pressure therapy during meditation would have on biological responses and self-reported measures of positive and negative affect. Correlated samples t-tests showed no significant differences in the temperatures recorded for conditions with a dog present during a meditation session when the dog engaged in deep pressure therapy versus when the same exercise was completed without the dog. Similar analysis on the variability of such data showed no significant decrease in the condition with the dog versus without the dog during the same meditation. Self-report surveys showed no significant difference between negative or positive affect for the respective conditions, with distinct contradictions of expected directionality of such values. Despite a lack of empirical significance, the support for this hypothesis within prior research is undeniable. The implications of this research and its limitations are discussed at length for consideration in future studies.*

**Title:** **Delta-8 THC in Hemp Products**
Students: Madeline Underwood, Christina Awwad
Advisor: Dr. Alison Holliday
Location: HUB Gallery

*In the past year, there has been an explosion in the number of commercial products containing delta-8-tetrahydrocannabinol (delta-8-THC). This relative of the active ingredient in marijuana, delta-9-THC, is thought to have some psychoactive properties. However, it is currently unregulated and thus can be sold in states where marijuana use remains illegal or subject to high levels of regulation. We have optimized a liquid chromatography-mass spectrometry separation of delta-8 from delta-9, as well as other cannabinoids commonly found in hemp samples. Analysis of delta-8-enriched hemp samples shows a high level of heterogeneity within the sample, likely reflecting the method used to apply the delta-8-THC.*

**Title:** **Modular Magic Sudoku**
Students: Calum Taft-Lockard, Hannah Kolonoski, Adelaide Treibley, Harrison Krauss
Advisor: Dr. Nathan Shank
Location: HUB Gallery

*In this project, we define and explore properties of magic squares that have been redefined in terms of modular arithmetic. Then, we apply these properties to magic/Latin squares to construct Sudoku boards that are similarly defined to the sub-squares. A question we answer is, are these expanded boards possible and solvable? Additionally, we demonstrate the properties of unsolvable boards, along with patterns that may exist within boards.*

**Title:** **Effects of Breathing and Self-Compassion on Well-Being**
Students: Grainne Schroeder
Advisor: Dr. Bob Brill
Location: HUB Gallery

*Research has shown mindfulness-based interventions to be associated with decreased psychological struggles. The present study aimed to investigate whether breathing and self-compassion would positively enhance the well-being of subjects. Participants were randomly assigned into three groups: self-compassion, breathing, and a combination. A baseline survey was used as the control to assess the degree of change from pre to post-intervention. The data yielded significant differences between groups for the overall change in 'compassion', 'resilience', and a reduced feeling of 'negative affect'. Despite the lack of support for the initial hypothesis, there was significant data that suggests these findings can assist in alleviating psychological struggles and improving well-being.*

**Title:** **Come to the Dark Side, Its Cooler: Comparing Thermal Ecology Readings Between Secondary Rainforests and Man Made Clearings**
Students: Rikki Jo McRae, Hailey Hoffman, Dwight Holloway
Advisor: Dr. Sara McClelland
Location: HUB Gallery

*We set up an experiment to monitor the temperature differences between secondary growth rainforest and a man-made clearing to better understand the living conditions for amphibians in these two habitats. We hypothesized that the rainforest would provide a cooler habitat for amphibians. We used agar frog models to test differences in temperatures placed around a man-made clearing and various locations next to a trail within the rainforest. Agar frog models have been shown to accurately model the temperatures of amphibians in different habitats. Results showed that temperatures in the cleared area were higher than those of the rainforest. We can conclude that the secondary rainforest growth is providing a suitable environment in terms of temperature for amphibian habitat, and conservation efforts should continue to regrow man-made clearings to help grow and maintain amphibian population and ecosystem homeostasis.*

**Title:** **The Thermal Ecology of Agar Frog Models in Different Microhabitats.**
Students: Alondra Cortes, Ebony Saccento, Maria Rosario
Advisor: Dr. Sara McClelland
Location: HUB Gallery

*As amphibians, frogs are ectothermic. This means they can't internally control their body temperature. Instead, they rely on the environment to control their body temperature. In this study, we collected data on the temperature frogs experience in different microhabitats. It was hypothesized that different microhabitats would impact frog temperature, with increased temperatures in the sun. To test this we used agar frog models, which have been shown to accurately model frog body temperatures. We split agar frog models into two groups: models in sunny microhabitat and models in shady microhabitats. We measured the temperature of all models and found the average of each group. Our results showed that models placed in the sun had higher temperatures. The average temperature of the frog model in the shade was approximately 26ºC while the average temperature of the model placed in the sun was approximately 28ºC. In conclusion, our research displays that frogs can not stay active in the sun and will more likely stay in shaded environments because of their ability to not be able to cool their body temperature in sunny conditions.*

**Title:** **The Effect of the Antioxidant, Curcumin, on a B. thailandensis infection model in macrophages.**
Students: Jacob Freeh
Advisor: Dr. Kara Mosovsky
Location: HUB Gallery

*Burkholderia pseudomallei is a gram-negative bacteria that causes melioidosis, which is a serious and potentially deadly disease. In the present day it is difficult to treat melioidosis, due to the high antibiotic resistance of B. pseudomallei. In order to find treatments for melioidosis, we study Burkholderia thailandensis, a close relative to the severely infectious B. pseudomallei. In this study the effects of an antioxidant, curcumin, were explored by introducing curcumin as a treatment to macrophages infected with B. thailandensis. Curcumin, a pigment from the spice turmeric, works as an antioxidant that reduces the presence of oxidative compounds and inflammatory responses in cells. After testing a range of curcumin concentrations on healthy cells, we chose a dose to test in our infection model. So far our data points to curcumin killing bacteria in an infection at this dose on its own and a synergistic interaction between curcumin and the antibiotic, ceftazidime. This resulted in enhanced bacterial killing in our infection model. We will continue to explore what effect curcumin has directly in the infection as well as with ceftazidime. Doing so may help us find a better treatment for melioidosis.*

**Title:** **Impacts of Color Morph and Habitat on Frog Body Temperature in a Tropical Location Using Agar Frog Models**
Students: Ashley Hercik, Emily Miller, Anthony Disipio
Advisor: Dr. Sara McClelland
Location: HUB Gallery

*We examined the thermal contrasts between different color morphs of frogs using agar frogs as models. Agar models have previously been shown to accurately measure frog body temperatures. We hypothesized that darker frogs would experience more temperature change while being out in the field. Agar frog models representative of three different colors (Light, Medium, Dark) were placed throughout an open cabin area and along a river trail in the rainforest at Camaquiri Conservation Initiative, Costa Rica. The frog models were left to sit and temperatures were recorded at two separate times. In contrast to the hypothesis, dark frogs were the coolest among the color morphs. They experienced the smallest temperature change between locations compared to the light-colored morph which experienced a greater change. Additionally, we found that there is a significant temperature difference between the color and the main location of each frog group. Our study suggests that a frog's color and habitat are both influential in regard to how frogs are impacted by environmental temperatures.*

**Title:** **The Fate of Microplastics in Anuran Larvae**
Students: Scott Kornfeind
Advisor: Dr. Sara McClelland
Location: HUB Gallery

*Microplastics, or plastic fragments between 0.1 µm - 5 mm in size, are a common environmental pollutant. Once organisms are exposed to this pollutant, the microplastics can enter their bodies leading to physiological impacts. Some of these impacts cause damage to various tissues like the gills, liver, mouth, and the digestive tract. There is limited research on how microplastics move within an organism. Even less is known about how amphibians are impacted. The aim of this experiment was to expose larval tadpoles to polyethylene (34-50 µm diameter) fluorescence microplastics at either 100 µg/L, 10 µg/L, 0.5 µg/L, or a control of filtered water for three weeks. This would enable visualization of microplastics in the body and help us determine the organs/tissues the microplastics enter. To date, I have found microplastics in the digestive tract, the tissues of the mouth, and the gills. This research is the first to visualize and provide detailed images of microplastic distribution throughout the body in tadpoles.*

**Title:** **DNA and Protein Binding Kinetics of Novel Dirhodium Complexes**
Students: Gwen Kester

Advisor: Dr. Shari Dunham
Location: HUB Gallery

*Rhodium complexes are being studied as potential cancer treatments to replace the platinum-containing drug cisplatin. While some cancer treatments with cisplatin are known to be effective, these treatments result in serious side effects, making an alternative drug desirable. The ability of rhodium complexes to bind to a variety of biomolecules, including DNA and proteins, is important for their activity in cancer cells. In this study, the binding kinetics of four rhodium complexes, each with different components around the rhodium centers, were studied in reactions with double-stranded DNA and a small soluble protein (serum albumin). These reactions were monitored over time and differences in binding rates were dependent on the presence of greasy or sugar-containing components in the rhodium complexes. All complexes exhibited faster and more complete binding to protein as opposed to DNA. The more greasy complexes bound more quickly to protein. While DNA binding was slow and limited for all complexes, the less greasy and sugar-containing compounds bound more rapidly. These data help to identify potential biological targets of these complexes, direct the design of future rhodium complexes, and explore the toxicity of these complexes in human cancer cells.*

**Title: The Effect of Visual and Verbal Working Memory Factors on Time Perception**
Students: Luke Assande
Advisor: Dr. Sarah Johnson
Location: HUB Gallery

*The impacts of working memory on time perception have been demonstrated by prior research (Cronin & Irwin, 2018; Pan & Luo, 2011; Polti et al., 2018; Teki & Griffiths, 2014). These effects include several factors, most notably that working memory load decreases time perception accuracy (Polti et al., 2018; Teki & Griffiths, 2014). The present study investigated the effects of working memory load on time perception, including if the simultaneous combination of visual and verbal working memory factors in a dual-working-memory-task would especially decrease accuracy in time perception. The results of the present study are consistent with previous research in regards to the effects of working memory load on time perception (Polti et al., 2018; Teki & Griffiths, 2014), but do not support the hypothesis that the proposed dual-task effect on time perception occurs.*

**Title: Moravian Cheese Hounds**
Students: Jack Wagner
Advisor: Dr. Jeffrey Bush
Location: HUB Gallery

*This project was in collaboration with a fellow Club at Moravian. The project consisted of designing a 3D printed greyhound that had numerous different themes. The 3D printing club and Cheese Club wanted to have a collectible item that gave credit to both clubs. Using CAD software I designed roughly 10 different versions of greyhounds each having different features that including hats, trophies and other accessories. I then printed out my designs and gave them to the Cheese Club for their event. This project was very successful and it really demonstrated the value of 3D design.*

**Title: Molecular Analysis of Drosophila Seizure Mutations**
Students: Hayley Carroll
Advisor: Dr. Christopher Jones
Location: HUB Gallery

*There are nearly a dozen genes in Drosophila which, when mutated, result in seizures. Upon vigorous physical stimulation (violently agitating their container so that the flies "bang" against the walls), these so-called "bang-sensitive" flies undergo violent spasms followed by paralysis, renewed spasms, and then recovery. After seizure recovery flies enter a "refractory period," during which the same stimulus cannot induce seizures in them. Previous research students succeeded in identifying two such bang-sensitive genes. The goal of this study is to*

*identify the sequence change responsible for the "bas" seizure mutation. The sequence of the identified "bas" gene was amplified with PCR using three primer pairs to sequence the entire gene. Once all of the sequence data for each stock of mutants is collected, the mutant sequences will then be compared to the wild type sequence in order to determine the source of the bang-sensitive mutation.*

**Title:** **A Study of Solo Chess and Strategies for Solvability**
Students: Aidan Malloy, Braden Kirkpatrick, Yousuf Kanan
Advisor: Dr. Nathan Shank
Location: HUB Gallery

*In this study, we attempt to analyze Solo Chess, a modification of classical chess, with new parameters. Our analysis is targeted to the solvability of various forms of this game, as well as subsequent strategies and outcomes.*

**Title:** **Identifying Rhodium Binding Sites on Serum Albumin**
Students: Maria Rabih
Advisor: Dr. Shari Dunham
Location: HUB Gallery

*Rhodium complexes have been designed as potential anticancer agents with focus on their ability to bind to important biological molecules, including proteins and DNA. This work focuses on the interaction of two rhodium complexes (dirhodiumtetraacetate and dirhodiumtetrabutyrate) with serum albumin, a small soluble protein that has high binding capacity for small molecules and carries many drugs in blood. The goal of this work is to determine the binding locations on serum albumin that are preferred by various rhodium complexes using a method known as MALD-MS. In matrix-assisted laser desorption ionization mass spectrometry, the mass of protein fragments can be determined before and after modification with rhodium complexes. Protein samples are enzymatically digested into smaller peptides, then desalted and mixed with a matrix compound prior to MALDI-MS analysis. Mass spectra from unmodified and rhodium-modified serum albumin samples will be presented and locations of rhodium modification on this protein will be discussed.*

**Title:** **Fables: An Experience**
Students: Lila Shokr
Advisor: Camille Murphy
Location: HUB Gallery

*As population grows and industry continues to morph and evolve, the environment progressively suffers. As does human kind's individual relationship with nature. Current environmental consciousness is ever present and a constant on our generations minds. The data from climate disasters seems never ending. It often leads to a response of detachment and numbness, and in turn that echoes into detachment from the issue. Simultaneously there is a current resurgence of the usage of ancient and indigenous architecture and design techniques that people have found to be more sustainable and ecologically safe. Past methodologies are coming into play more as people find themselves in unknown territory. The topic of human-nature relations through a moral and ethical view has been taught to many through the use of literary fables. This genre broaches upon the complex relationships of man and its environment through anthropomorphic animals and natural characters. Relearning and finding connection to one's individual environment is essential to the future of the crisis. Reestablishing the relationship between humans and nature through these tales can be furthered by experiential design, which creates a relationship with the viewer.*

**Title:** **Scientific Illustration of Cosmetidae of Cuba**
Students: Riley Masten
Advisor: Dr. Daniel Proud
Location: HUB Gallery

*In this study, we explore various techniques used for scientific illustration as we study the diversity of the harvestmen family Cosmetidae (Arachnida: Opiliones: Laniatores) with a focus on Cuban species. Based on a recent molecular phylogeny of the family Cosmetiade, we were able to group most cosmetids of Cuba into two valid genera: Cynortoides and Cynortellana. Illustrations and high-quality photographs are important components that complement a written species description. The detailed study of the morphological structures enables us to identify synapomorphies for genera that were delimited using the molecular phylogenetic framework. By understanding and exploring the cosmetid harvestmen of Cuba, we can learn to better define genera in this mega-diverse family and apply these approaches to other genera in the continental Americas.*

**Title:** **Studying the diversity of Cosmetidae (Opiliones: Laniatores) in the Dominican Republic**
Students: Melody Fermin
Advisor: Dr. Daniel Proud
Location: HUB Gallery

*Harvestmen, known as daddy longlegs, are incredibly diverse throughout the Greater Antilles but most families are very poorly studied. There are currently nine described species of harvestman in the family Cosmetidae that are known from the Dominican Republic. While studying samples collected in 2014, we have identified 12 morphospecies, of which only two represent previously described species: Cynortoides v-album and Arucillus armasi. In this study, we aim to elucidate the true diversity of the family Cosmetidae and understand how the species are related to one another. High resolution photographs were captured using a camera mounted on a stereomicroscope, and detailed studies of the morphology are underway. In addition, we extracted DNA from the morphospecies and will amplify three gene regions (16S, COI, and 28S) to better understand how these species are related to one another and to other species throughout the Caribbean Islands.*

**Title:** **Understanding the Mechanism of Seleno-L-Methionine protection of Burkholderia-infected Macrophages**
Students: Brooke Coonrod
Advisor: Dr. Kara Mosovsky
Location: HUB Gallery

*Burkholderia pseudomallei is a gram negative bacteria that is the causative agent to melioidosis, an infectious disease native to Southeast Asia and Northern Australia. B. pseudomallei has evolved to become resistant to many antibiotics, and the current treatments involve a long and inaccessible process. B. pseudomallei has the ability to invade and proliferate inside both phagocytic and non-phagocytic cells, making it difficult to target with antibiotics alone. Therefore, there is an increased need for more effective and accessible treatment options. In recent years, we have found that a dietary antioxidant, Seleno-L-methionine (SeMet), reduces both the intracellular and extracellular bacterial burden, and protects the cells from cell death. The reduction due to this antioxidant was comparable to a combination of an antibiotic and immune stimulant that we had previously found successful. This result spurred us to investigate the mechanism of the SeMet protection. Through western blotting we quantified levels of apoptotic proteins to see whether SeMet protected infected cells from this type of cell death. We also quantified levels of proinflammatory cytokines using enzyme linked immunosorbent assays to see whether SeMet could protect cells by decreasing inflammation. We found that SeMet may decrease inflammation, which could help explain its protective effect.*

# Student Poster Presentations II
## PPHAC Atrium
## 4:00 - 5:00 PM

**Title:** **Social Media Usage and Levels of Consumerism of College Students in the United States**
Students: Helen Meckstroth
Advisor: Dr. Adams O'Connell
Location: PPHAC Atrium

*This study examines social media usage in college-age students in the United States and how this usage may impact their levels of consumerism. The primary method of data collection is a survey that was distributed to college-age students at a small, liberal-arts college in the United States. Expanding upon existing studies of social media, this study aims to provide a more specific and detailed picture of how different social media platforms affect levels of consumerism. This study examines the relationships between social media usage, self-esteem, and materialism.*

**Title:** **A Slice of Moravian's History**
Students: Vanessa Gabovitz
Advisor: Dr. Natasha Woods
Location: PPHAC Atrium

*Bethlehem, Pennsylvania is home to some of the oldest and largest trees in the country. Moravian University has been recognized as a Tree Campus USA since 2015 for involving staff and students in their forest management and conservation goals. The trees on Moravian University's campus have been recognized as "Heritage Trees" as some have stood for many centuries and are a great part of Moravian's history. Each year, Moravian's Sustainability Committee celebrates Arbor Day by selecting new trees to be planted on campus. These trees are then entered into Moravian's Tree Inventory catalog, which includes over 1200 trees! In 2007, an English Elm was cut down from South Campus because it was suspected to have Dutch Elm disease. This tree is estimated to be 161 years old. In 2017, Dr. Frank Kuserk and his students, now Moravian alumni, started a project to restore a slab of the English Elm. The current project picks up where Dr. Kuserk's group leftoff and has continued the restoration process. A timeline that includes the Moravians, the City of Bethlehem, and Moravian University has been added to the tree and the tree will eventually be displayed in Collier Hall of Science where Dr. Kuserk worked.*

**Title:** **Predator Avoidance Behavior in Grass Shrimp**
Students: Jillian Connelly
Advisor: Dr. Joshua Lord
Location: PPHAC Atrium

*Grass shrimp (Palaemon pugio) are common and ecologically important in coastal environments along the Atlantic coast of the United States, but little is known about their behavior. Predator-prey interactions and predator avoidance behavior are particularly understudied in this species, especially because grass shrimp are a major food source for commercially and environmentally important blue crabs. The primary goals of this study were to categorize predator-prey interactions with blue crabs, and in direct predator exposure experiments, we observed and quantified previously undescribed predator inspection behavior in P. pugio. This type of behavior is largely undocumented in invertebrates, which presented the opportunity to examine the complex and unknown predator-prey dynamics between two ecologically important species. There was a high degree of individual variation in this "bold" predator inspection behavior, suggesting a difference in behavioral traits between shrimp. Because existing research on predator inspection behavior centers almost exclusively on vertebrates, these findings have interesting implications for invertebrate behavior and the evolution of predator avoidance strategies*

*like these. Grass shrimp appear to have complex social structures and predator avoidance strategies that are only now being documented, which is essential for understanding their ecological role.*

**Title:** **Gobblet**
Students: Heather Adams, Evan Bulette, Victoria Samuels, Victoria Harper
Advisor: Dr. Nathan Shank
Location: PPHAC Atrium

*For this project we will be analyzing the gage Gobblet which is a variation of tictactoe. We will be playing on a 3 x 3 board and changing the order in which the game pieces are played. Also, we will be changing what pieces are allowed to gobble other pieces, the number of pieces, and how pieces move on the board. To find an ideal strategy, we consider different strategies and determine which player wins each game.*

**Title:** **Impact of Ocean Acidification on the Foraging Behavior of Mud Snails**
Students: Hailey Hoffman
Advisor: Dr. Joshua Lord
Location: PPHAC Atrium

*Mud snails are important and abundant scavengers in soft-sediment habitats along the Atlantic coast. They use their chemosensory abilities to detect food cues, but it is possible that this ability will be diminished by ocean acidification. Acidification affects cue-sensing ability of some fish and invertebrates (while others are relatively unaffected), and previous research found that mud snails struggled to sense predators in acidified water. This study investigated the foraging behavior of mud snails under increasingly acidified conditions. Time lapse photography was used to observe snail movement as they searched for food under control and acidified conditions. ImageJ was used to track the snails, map their routes and calculate their foraging efficiency. This method allowed us to visualize foraging behavior and ocean acidification impacts in a new way. If snail foraging is reduced under future ocean conditions, it could lead to a shifting ecological role for this gastropod.*

**Title:** **Selfish Shellfish: Shelter Sharing in Grass Shrimp (Palaemon pugio)**
Students: Ayleen Mexquititla
Advisor: Dr. Joshua Lord
Location: PPHAC Atrium

*Grass shrimp (Palaemon pugio) are abundant in estuaries along the Atlantic coast and are important consumers and prey in estuarine ecosystems along the Atlantic coast. Despite their abundance, little is known about grass shrimp behavior, but recent research discovered that they have dominance hierarchies largely based on claw size. It is unknown how these hierarchies play out in larger groups and what role they play in shelter allocation and habitat use. Will groups of large-clawed shrimp dominate the higher-quality habitats? This experiment was conducted to investigate the link between grass shrimp claw size and shelter use in a large tank that simulates their natural environment. The tank contained a high-value and a low-value shelter, as well as 5 large-clawed and 5 small-clawed shrimp that were tagged and observed with time-lapse photography. Analysis and mapping in ImageJ indicated that shrimp were unlikely to share shelter and claw size controlled access to shelter. These results have interesting implications for habitat use, management, and organism responses to disturbed salt marsh habitats.*

**Title:** **Titanocene(III) Catalyzed Radical Arylation of Diphenyl Amino Epoxides with Electronically Different Substituents**
Students: Chad Propst
Advisor: Dr. Godfred Fianu
Location: PPHAC Atrium

*The reaction being studied is a titanocene(III) catalyzed atom-economical radical arylation of amino epoxides to form indoline derivatives that are basic motifs of common antitumor agents. To maximize the potential of the arylation process, a thorough mechanistic study was carried out and it was determined that the catalyst is stabilized by a salt additive and the turnover-limiting step is the back electron transfer from the radical sigma complex to the pendant titanium metal. To further establish the synthetic scope of this reaction, the regioselectivity of radical addition to diphenyl amino moieties with electronically different substituents on the arene needs to be studied. However, there are no synthetic protocols for synthesizing these epoxides with electronically different substituents on the arene. In this study, diphenyl amino epoxides with electronically different substituents on the arene were synthesized using multiple steps and analyzed using FTIR, NMR, and GC-MS. Using these synthesized epoxides, arylation reactions will be carried out through a titanocene(III) catalyzed reaction under an inert atmosphere to investigate the regioselectivity of radical addition. The arylation reaction yields two products with the substrate being used, however it is unknown at this time which is the major and minor product.*

**Title:** **Fishy Behavior in Shrimp: Shelter Use and Predator Harassment in Grass Shrimp**
Students: Isabelly Silva
Advisor: Dr. Joshua Lord
Location: PPHAC Atrium

*This study examined how the presence of a fish predator (mummichog, Fundulus heteroclitus) affected the habitat choice and group behavior of grass shrimp (Palaemon pugio). Although grass shrimp are abundant and ecologically important in salt marshes along the east coast of North America, their responses to predators have been minimally studied. The goal of this research was to determine how much the shrimp use the shelter with and without the presence of predators. Groups of shrimp were recorded before and after the introduction of the fish to quantify the amount of time spent in or near shelter, with fish shelter use recorded as well. We found that while shrimp habitat use did change in the presence of fish, shrimp also repeatedly attacked and harassed the predatory fish, in a novel antipredator behavior.*

**Title:** **Effect of Ocean Acidification on Grass Shrimp Feeding Behavior**
Students: Ashley Hutchison
Advisor: Dr. Joshua Lord
Location: PPHAC Atrium

*Grass shrimp are ecologically important in marshes along the Atlantic Coast, but are understudied and little is known about their behavior or their interactions. The goal of this study was to test the effects that ocean acidification, due to climate change, had on the ability of grass shrimp to find food. Grass shrimp decision making was tested through the use of a Y-maze in control and acidified waters. There wasn't a strong preference to either side of the maze and shrimp took slightly longer to make a decision in acidified waters. These differences were not statistically significant, which means grass shrimp are likely well-adapted to the increased acidity in the ocean. Additional experiments explored shrimp fighting behavior, investigating the link between claw size and feeding and foraging. Food caused an increase in aggressive behaviors between shrimp, with larger-clawed shrimp typically 'winning' the interactions. From this study, we concluded that grass shrimp foraging is socially complex but unlikely to be negatively influenced by ocean acidification.*

**Title:** **Ester hydrosilylations via a titanocene borohydride-PMHS reagent system**
Students: Elizabeth Jones
Advisor: Dr. Godfred Fianu
Location: PPHAC Atrium

*Carbonyl reductions are an important and fundamental reaction in organic chemistry. Synthetic organic chemists have routinely applied this transformation to form basic motifs in multi-step syntheses of complex organic molecules. An efficient and environmentally friendly way to reduce esters via carbonyl hydrosilylations with a titanocene(III) borohydride-PMHS system was carried out on a Schlenk-Line under inert atmosphere. It was discovered that the use of isopropanol as an additive accelerated both the formation of the active catalyst and the*

*hydrosilylation of esters. The breadth of this approach was investigated by probing the reduction of a variety of esters with different steric and electronic properties. The product yields were measured using a variety of analytical techniques such as GC-MS, NMR, and FTIR. Overall, the optimized procedure for ester hydrosilylations via a titanocene borohydride-PMHS reagent system was successful for a large variety of substrates, and preliminary mechanistic studies indicate a titanocene(III) hydride species is formed in situ and this new complex is responsible for subsequent carbonyl hydrosilylations.*

**Title:** **Students Attitudes towards Poverty Before and After a Poverty Simulation at Moravian University in 2022**
Students: Mahum Naveed
Advisor: Dr. Colleen Payton
Location: PPHAC Atrium

*Introduction: The poverty simulation is a live action simulation in which participants role-play the lives of low income families. This simulation provides students with an opportunity to understand poverty through an experiential setting and empathize with low income populations.*
*Purpose: 1) Measure students' attitudes towards poverty before and after a poverty simulation at Moravian University in 2022 including personal deficiency, stigma, and structural perspective, and 2) synthesize successes and lessons learned for future poverty simulations.*
*Methods: A cross-sectional design was utilized to measure students' attitudes towards poverty before and after a poverty simulation using the attitudes towards poverty short form scale (Yun & Weaver). The questions in the survey were separated into three sections: personal deficiency (perception of poor people), stigma (biased beliefs surrounding poor people), and structural perspective (structural causes of poverty).*
*Results: Stigma significantly decreased before and after the poverty simulation ($p = .02$). Structural perspective and personal deficiency did not significantly change.*
*Discussion: The poverty simulation could be implemented in the future to decrease stigma related to poverty. Future poverty simulations could be enhanced to better address personal deficiency and structural perspective. Attitudes towards poverty could influence support for the policies and programs available for low income populations.*

**Title:** **Speech-Language Pathology and Music Therapy: An Exploration of Collaboration**
Students: Rachael Shaffer
Advisor: Dr. Eric Sanders
Location: PPHAC Atrium

*Speech-Language Pathologists (SLPs) often collaborate with other health-care professionals. This type of interprofessional practice (IPP) is thought to improve outcomes for the clients they serve (American Speech-Language-Hearing Association, n.d.). Less is known about IPP in relation to fields that are not a part of the traditional allied health professions including Music Therapy (MT). SLPs and MTs work collaboratively with clients across various communication impairments, ages, and settings (Geist et al., 2008). There are, however, controversial aspects related to this relationship related to billing and clinical responsibilities. The goal of this project is to understand the perspectives and experiences of SLPs who have co-treated with MTs. During Summer 2022, 11 semi-structured interviews were completed with SLPs who have co-treated with MTs within the past 5 years. Topics included what the collaboration was like, how often this collaboration occurred, and if there were any conflicts. Transcripts of these interviews are being analyzed using Thematic Analysis which includes several rounds of reviewing and coding the transcriptions (Braun & Clarke, 2006). The results will allow for identifying key components of this collaboration across various environments. These findings will also be discussed relative to clinical applications and implications for future collaborations between SLPs and MTs.*

**Title:** **Does Competition Reduce Salt Tolerance in Cereal Grasses?**
Students: Nicholas Petrisko
Advisor: Dr. Natasha Woods
Location: PPHAC Atrium

*Saline soil is slowly becoming one of the greatest threats of agriculture worldwide. As salts in the soil increase, arable soil, and subsequently crop yield, decreases drastically. It is imperative that farmers find crops that are more salt tolerant. Rye and barley are two important cereal grasses that are known for their salt tolerance. The goals of this research were 1) to investigate the extent to which salinity impacts the capacity of cereal crops to germinate and 2) to determine whether competition at the seedling stage of development decreases their capacity to be salt tolerant. Seeds were allowed to germinate at 0 ppt and 10 ppt and rye and barley seedlings were allowed to establish in monocultures and in mixed cultures. There were five replicates of each treatment group. Results showed that salinity stress and competition had no significant impact on the germination of barley and growth; however, rye was negatively impacted by both factors. The results suggest that, of the two, barley would be able to be planted in fields with salinity up to 10 ppt, and yield would not significantly decrease in yield.*

**Title:** **Group Foraging Behavior of Mud Snails (Ilyanassa obsoleta)**
Students: Bianca Rodriguez
Advisor: Dr. Joshua Lord
Location: PPHAC Atrium

*Mud snails are essential scavengers in coastal habitats along the east coast of North America but have yet to be examined in depth by much scientific research. Environmental factors like temperature, salinity, and ocean acidification can affect the foraging behavior of these snails. For this study, we specifically studied the foraging behavior of groups of snails and compared them to individual snail foraging. The study was done by using a time-lapse photography process to capture and visualize the snail's foraging efficiency in a tank. Snails were then tracked and mapped in an image processor called ImageJ. The effect of the snails being in groups allowed them to follow trails, which has the potential to increase their foraging efficiency. These results are significant because, in their natural environment, these snails are found at extremely high densities, so assessing their individual foraging behavior in the lab may not incorporate any group dynamics that could influence foraging efficiency.*

**Title:** **The Effects of Mental Health & Wellness Courses on College Students' Mental Health**
Students: Cristina Merone
Advisor: Dr. Bob Brill
Location: PPHAC Atrium

*The mental health and well-being of college students has become increasingly relevant in recent years. With this time period in their lives bringing new responsibilities and immense amounts of stress, it is important to have reliable resources on campus for students to fall back on. Implementing courses targeted at the mental health and well-being of college students is in hopes of bringing awareness to the topic, but also providing students with the knowledge and skills to effectively cope with their struggles. In order to investigate this topic, in a course offered at Moravian University in Spring 2022, PSYC 195: Mental Wellness, three pre-post mental health surveys were distributed at the start of the course and again at the end. For the duration of the course, students were taught helpful tools and coping strategies for mental health related struggles by the Moravian Counseling Center staff. Significance was found in two of the three surveys taken by students, showing an improvement in mental health and wellness from the beginning of the course to the end. Potential for future research is possible with a larger sample size, and by universities offering more courses aimed at the mental health of college students.*

**Title:** **Understanding the Role of PTEN in Src Recruitment and Inhibition by Cx43**
Students: Emily Wells
Advisor: Dr. Anastasia Thévenin
Location: PPHAC Atrium

*Connexin 43 (Cx43) is a transmembrane protein that constitutes intercellular communication structures called gap junctions (GJs). Cx43 C-terminus is phosphorylated at many serine and tyrosine residues, and these modifications to the protein are known to regulate many GJ functions, such as trafficking of Cx43 through the secretory pathway,*

*GJ assembly at the plasma membrane, opening and closing of GJs, as well as GJ internalization and degradation. Cx43 C-terminus contains a binding region for the oncogenic protein Src which is up-regulated in many types of cancers. Recent work in our lab has identified that phosphorylation of S373 on Cx43 C-terminus results in greater binding, and therefore inhibition, of Src to Cx43 even though this residue lies outside of the Src binding region. When Src binds to Cx43, cell proliferation and oncogenic activity decrease in cells, which means that Cx43 has the ability to serve as a tumor suppressor in Src-driven cancer cells. Current work is focused on determining whether the Src inhibitors Csk and PTEN are both necessary for effective inhibition of Src.*

**Title:** **On Properties of Minefield Pathing**
Students: Andreh Abdou, Lizzie O'Donnell, Garrison Koch, William Reinert
Advisor: Dr. Nathan Shank
Location: PPHAC Atrium

*We will be extending the glass bridge problem from Squid games into a mine field game where we ask how many people it takes for a group to successfully navigate through a minefield on an $n \times n$ grid. We first find bounds for the longest and shortest unambiguous paths through the grid.*

**Title:** **Synthesis of Novel Hydrophobic Dirhodium Compounds**
Students: Rebecca Skibo
Advisor: Dr. Stephen Dunham
Location: PPHAC Atrium

*Rhodium compounds show promise in the realm of cancer research because they are toxic to cells. Previously researched rhodium compounds have been shown to be toxic when they have either acetic or butyric acids as ligands. My research has been to synthesize a new rhodium compound with a mixture of acetic and butyric acid ligands so that its toxicity can be determined. I first synthesized a rhodium acetate compound with one trifluoroacetic acid (TFA) ligand that can be easily replaced. Using this new compound, I ran various reactions using butyric acid to replace the TFA. To study these reactions, I used tools like high-performance liquid chromatography (HPLC) to purify reaction products and analyzed samples using nuclear magnetic resonance (NMR) and mass spectrometry (MS). By adjusting the polarity of the solutions on the HPLC, I was able to identify a new peak, which would be classified as a rhodium-butyrate compound bonded with acetate. The next steps are to purify and analyze the compound further so that it can be tested for toxicity in cancer cells.*

**Title:** **Reduction of Nitriles to Amines Using a Titanocene Borohydride-PMHS Reagent System**
Students: Jonathan Hixson-Cooper
Advisor: Dr. Godfred Fianu
Location: PPHAC Atrium

*Amines are used in numerous industries to create complex organic products like dyes, plastics, surfactants, and even anti-corrosion agents. Amines are also very important in the pharmaceutical industry for the synthesis of various central nervous system drugs. The goal of this research was to develop a process reducing nitriles to their corresponding amines via a titanocene borohydride-PMHS reagent system. These reactions were run under argon atmosphere on a Schlenk line. The titanocene-borohydride catalyst was formed by dissolving titanocene dichloride and sodium borohydride in 1,2-dimethoxyethane (DME). The reactions were worked up using 1M NaOH and the amine salt isolated using 1M HCl in ether. The amine salt was then redissolved in NaOH and extracted using ether. The products were analyzed using GC-MS, NMR, and FTIR.*

**Title:** **Synthesis of Esters for Titanocene(III) borohydride-PMHS Hydrosilylations**
Students: Gia LaSalle
Advisor: Dr. Godfred Fianu
Location: PPHAC Atrium

*In this study, a variety of esters were synthesized by reacting acyl chlorides with alcohols. The method for this synthesis was further optimized to improve the yields and purities of the esters. Due to the exothermic nature of this reaction, the experiment had to be performed in an ice bath to prevent the formation of unwanted side products. A non-coordinating base additive was also needed to drive the reaction to completion. The esters synthesized were analyzed by GCMS and NMR. The esters synthesized will be used in the study of carbonyl hydrosilylations with a titanocene(III) borohydride-PMHS system, which is an efficient and environmentally friendly way to reduce esters to alcohols.*

**Title:** **Analyses of PTEN Phosphatase Activity Toward Connexin 43**
Students: Victoria Donovan
Advisor: Dr. Anastasia Thévenin
Location: PPHAC Atrium

*Our laboratory has been focused on understanding how a tumor suppressor protein, connexin 43 (Cx43) serves as an inhibitor of a cancer-causing protein called Src. We have identified a molecular mechanism of multiple Cx43 phosphorylations (a type of chemical modification) that are needed for effective interaction with Src, leading to Src inhibition. Cx43/Src interaction leads to a recruitment of an inhibitor of Src, an enzyme PTEN. This enzyme is a phosphatase - it removes phosphorylations from other proteins and is known to dephosphorylate Src, thus inhibiting its cell proliferation activity. Intriguingly, while studying interactions between Cx43, Src and PTEN, we observed direct interaction between Cx43 and PTEN in the absence of Src. Thus, we hypothesized that PTEN may not only dephosphorylate Src, but may function as a phosphatase that is able to dephosphorylate Cx43, as well. To test this hypothesis, we have generated pure Cx43 proteins that have been strategically phosphorylated at specific sites. We plan on using these Cx43 proteins in testing purified PTEN's ability to remove these phosphorylations in vitro. Given the lack of understanding of Cx43 interaction with phosphatases, this work will help shed light on these important chemical modifications of Cx43.*

**Title:** **Epoxide Synthesis for Titanocene(III)- Catalyzed Radical Arylation Reactions**
Students: Michel Issa
Advisor: Dr. Godfred Fianu
Location: PPHAC Atrium

*In this study, the synthesis of two epoxides, N-((2-methyloxiran-2-yl)methyl)-N-phenylaniline, and 4-methyl-N-((2-methyloxiran-2-yl)methyl)-N-phenylaniline were demonstrated. Both epoxides were synthesized via multi-step processes with each reaction step carried out under carefully controlled conditions, and monitored using thin layer chromatography (TLC). The final products were purified using column chromatography and analyzed using GC-MS and NMR. Preliminary results indicate that the developed synthetic process produced pure desired epoxides. However, product yields were low to moderate and work is currently underway to further optimize the synthetic process. The obtained epoxides will be used to carry out titanocene(III)- catalyzed radical arylations to form indoline derivatives that are basic motifs found in common antitumor agents.*

**Title:** **The Influence of Colored Light on Test Anxiety**
Students: Allison Dougherty
Advisor: Dr. Sarah Johnson
Location: PPHAC Atrium

*Test anxiety is a common stressor in some people's everyday lives. It makes them worry about performance on the exam, not having enough time to finish, etc.. It can severely affect one's academic performance (Duraku & Hoxha, 2018). There have been lots of relaxation techniques that have been found by researchers to help decrease anxiety and panic thinking during an exam. Color therapy has been used for many years to aid in human behavior changes. Certain colors like blue promote a relaxing feeling in people, while red tends to increase one's feelings of danger (Recours & Briki, 2009). Purple light, however, has not been studied. Participants will take a small exam*

*in a room with a lamp emitting a colored light from it. Their heart rate will be measured to examine how the color of light in the room affected their anxiety and promoted any sort of calmness in the participants. The hypothesis of this experiment is that blue or purple lights will decrease test anxiety and increase performance, and red light will increase test anxiety and decrease performance on an exam. If the hypotheses are supported, this could aid in the development of more comfortable classroom environments for students during exams.*

**Title:** **Wide Open Spaces: Borders, Boundaries and Identity in "Sin Nombre"**
Students: Brianna Whalen
Advisor: Dr. Claudia Mesa
Location: PPHAC Atrium

*"Sin Nombre" (2009), directed by Cary Joji Fukunaga, explores the complicated emotions and conditions under which individuals migrate from Central America to the United States. When leaving one's home country, safety and identity can feel like they are being left behind. A formal analysis of the cinematography reveals that this struggle is portrayed by the use of open and closed spaces, such as the top of a train and a childhood bedroom. Although in principle large open spaces represent namelessness and danger, while closed spaces represent identity and safety, I argue that in "Sin Nombre", this is not a binary, as the film also challenges the idea of what creates an open or closed space, as well as who can move through them. The tumultuous path that the main characters undergo together creates a compelling story of suffering and redemption while also demonstrating the reality of the perils of attempting to cross the United States border.*

**Title:** **Environmentally Realistic Levels of a Common Pesticide Causes Changes to Larval Behavior and Brain Morphology in an Amphibian Mode**
Students: Delanie Crabtree
Advisor: Dr. Sara McClelland
Location: PPHAC Atrium

*Malathion is a commonly used organophosphorus insecticide, often contaminating natural habitats. Non-target organisms, such as amphibians, are exposed to these chemicals in their habitats. Malathion functions by inhibiting the enzyme acetylcholinesterase (AChE), which can cause nausea, seizures, and death at high concentrations. However, the impact of low, environmentally realistic concentrations of malathion has not been well documented. Due to decreasing amphibian populations, it is especially important for us to understand the impact of these chemicals at a concentration that amphibians are often exposed to. To explore these effects, Northern Leopard Frog tadpoles (Lithobates [Rana] pipiens) were exposed to either a vehicle control or 1 µg/L of malathion for three weeks in a blind-controlled laboratory study. During the exposure period, their behavior was monitored weekly. At the end of the exposures, tadpoles were removed from treatments for 24 hours and a final series of behavioral assays were performed. Body and brain morphology were then analyzed. Results revealed significant changes in both behavior and in the brain morphology of tadpoles exposed to malathion. This study provides evidence that, even at low environmentally realistic concentrations, organophosphates can impact tadpole neurodevelopment.*

**Title:** **Map Kinase Story**
Students: Lauren Latchford
Advisor: Dr. Anastasia Thévenin
Location: PPHAC Atrium

*Phosphorylation of connexin 43 (Cx43) is an important regulatory mechanism of gap junction (GJ) function. Cx43 is modified by several kinases on over 15 sites within its ~140 amino acid-long C-terminus (CT). Treatment of cells with growth factors causes activation of the ERK (extracellular signal-regulated kinase) pathway and phosphorylation of Cx43CT on S255, S262, S279 and S282; this leads to GJ closure and recruitment of endocytosis machinery. ERK is a member of the mitogen-activated protein kinase (MAPK) family that consists of two additional members: JNK (c-jun N-terminal kinase) and p38. Phosphorylation of Cx43CT by ERK has been widely documented in several cell lines, by a large number of investigators. Phosphorylation by JNK and p38, on the other hand, is not well-established. Indeed, ERK is a kinase activated by growth factors and is upregulated in diseases, such as cancer. JNK and p38, however, have a largely tumor-suppressive function due to their stress-activated and apoptotic role. We set out to investigate substrate specificity of all three MAPKs toward Cx43CT, both in vitro and in two cell lines (MDCK - non-cancerous, epithelial cells and porcine PAECs – pulmonary artery endothelial cells). We co-expressed each MAPK with their upstream kinases in E.coli and purified ERK, JNK and p38 by affinity chromatography. We tested the ability of each MAPK to phosphorylate pure Cx43CT in vitro, using alanine mutants at S255, S262, S279 and S282 as negative controls. Cx43 phosphorylation was monitored through gel-shift assays on an SDS-PAGE, immunodetection with phospho-Cx43 antibodies and LC-MS/MS analyses. Similarly, experiments in LNCaP and MDCK cells expressing full length Cx43 under ERK, JNK or p38-activating conditions have been completed. Our results demonstrate clear differences in specificity of each MAPK toward Cx43, and underscore the importance of delineating the effects of ERK, JNK and p38 signaling pathways on Cx43 and GJ function.*

**Title:** **Probing DNA-Binding Sites of Novel Rhodium Complexes Through Mass Spectrometry**
Students: Kassandra Alicea
Advisor: Dr. Stephen Dunham
Location: PPHAC Atrium

*When some metals bind to deoxyribonucleic acid (DNA) they disrupt the function of the genome and can lead to genetic changes or cell death. The goal of this research is to identify where a metal binds to DNA using mass spectrometry. Matrix Assisted Laser Desorption Ionization-Time of Flight (MALDI-TOF), uses a laser to ionize a sample of interest. Ionized particles are then separated by their mass-to-charge ratio (m/z) by the time it takes to travel to the detector at the end of a vacuum flight tube. Due to the MALDI-TOF's sensitivity to ions, it is necessary to desalt our samples to reduce interference from sodium (Na+) and potassium (K+) ions that change the m/z ratio for a sample. This study consisted of optimizing MALDI-TOF acquisition parameters and preparation of nucleic acid samples. The importance of laser power and sample and matrix concentrations were investigated and methods for ion exchange to remove Na+and K+ions were explored. MALDI-TOF spectra for high concentrations of DNA.*

## Student Conference Presentations

**Rosh Bautista, Savannah Fehnel, Natalya Schienholz.** *That's A Wrap! Effects of the Wellness Recovery Action Plan on Occupational Performance of Allied Health Graduate Students,* American Occupational Therapy Association National Conference, April 2023
Faculty Mentor: Dr. Jennifer Maloney

**Alex Cabanela.** *We Thought She Would Be Able to Go: Exploring Parents' Experiences of Ableism Concerning School Trips*, Pennsylvania Department of Education Conference, March 2023
Faculty Mentor: Dr. Laurie Kahn

**Jillian Connelly.** *Predator Avoidance Behavior in Grass Shrimp,* National Council on Undergraduate Research, April 2023
Faculty Mentor: Dr. Joshua Lord

**Brooke Coonrod.** *Understanding the Mechanism of Seleno-L-Methionine Protection of Burkholderia-Infected Macrophages,* 7th Annual Symposium of the Lehigh Valley Molecular and Cell Biology Society, April 2023
Faculty Mentor: Dr. Kara Mosovsky

**Tyler Countess.** *Exploring Attitudes about Weight and Weight Stigma among Undergraduate Health Science Students,* Mid-Atlantic Regional Conference of the American College of Sports Medicine, November 2022
Faculty Mentor: Dr. Krista Rompolski

**Gabrielle Demchak.** *The Harary Index as a Measure of Network Reliability,* Joint Mathematics Meeting, Boston MA, January 2023
Faculty Mentor: Dr. Nathan Shank

**Cielo Disla.** *Systematic revisions of cosmetid harvestmen (Opiliones: Laniatores: Cosmetidae) in the Caribbean Islands.,* 22nd International Congress of Arachnology, Montevideo, Uruguay, May 2023
Faculty Mentor: Dr. Daniel Proud

**Hailey Hoffman.** *Impact of Ocean Acidification on the Foraging Behavior of Mud Snails, Benthic Ecology Meeting,* April 2023
Faculty Mentor: Dr. Joshua Lord

**Garrison Koch.** *On the n-attack Roman Dominating Number of a Graph and the Impact of Infinite and Finite Resources,* National Conference on Undergraduate Research (NCUR), University of Wisconsin-Eau Claire. , April 2023
Faculty Mentor: Dr. Nathan Shank

**Ayleen Mexquititla:**
*Selfish Shellfish: Shelter Sharing in Grass Shrimp,* Benthic Ecology Meeting, April 2023
Faculty Mentor: Dr. Joshua Lord

*Examining the impact of abiotic and biotic factors on early establishment of Morella cerifera,* National Conference on Undergraduate Research, April 2023
Faculty Mentor: Dr. Natasha Woods

**Maria Rabih.** *Identifying Rhodium Binding Sites on Bovine Serum Albumin,* Lehigh Valley Section of the American Chemical Society: Undergraduate Poster Session, April 2023

Faculty Mentor: Dr. Shari Dunham

**Gabrielle Rader:**
*Anxiety in Adolescents: Strategies, Experiences, and Nursing Implications*, National Student Nurses' Association Conference, April 2023
Faculty Mentor: Dr. Elise Colancecco

*Anxiety in Adolescents,* National Student Nurses Association, April 2023
Faculty Mentor: Dr. Elise Colancecco

**Macy Rauch.** *Participation of Students with Disabilities on School Trips: Experiences and Perceptions of Youth with Disabilities,* Pennsylvania Chapter of the American Physical Therapy Association Annual Conference (MovePA), October 2022
Faculty Mentor: Dr. Kimberly Wynarczuk

**Rachael Shaffer:**
*Speech-Language Pathology and Music Therapy: An Exploration of Collaboration*, Landmark Conference Research Symposium Inbox, July 2022
Faculty Mentor: Dr. Eric Sanders

*Speech-Language Pathology and Music Therapy: An Exploration of Collaboration,* National Conference on Undergraduate Research, April 2023
Faculty Mentor: Dr. Eric Sanders

**Sophia Shienvold:**
*Levels of Cytotoxic Rhodium and Platinum Compounds in Select Organelles within HeLa Cancer Cells,* NCUR, April 2023
Faculty Mentor: Drs. Anastasia Thévenin and Shari Dunham

*Levels of Cytotoxic Rhodium and Platinum Compounds in Cancer Cells,* Landmark Conference, July 2022
Faculty Mentor: Drs. Anastasia Thévenin and Shari Dunham

**Isabelly Silva.** *Fishy Behavior in Shrimp: Shelter Use and Predator Harassment in Grass Shrimp, Benthic Ecology Meeting,* April 2023
Faculty Mentor: Dr. Joshua Lord

**Rebecca Skibo.** *Properties of Brooker's Merocyanine: A Solvatochromic Compound,* Undergraduate Research at the Capitol: Pennsylvania, March 2023
Faculty Mentor: Dr. Carl Salter

**Brian Utzat.** *The Impact of COVID-19 Policies in Germany and the United States,* Undergraduate Research Conference in German Studies, April 2023
Faculty Mentor: Drs. Axel Hildebrandt and Eva Marikova Leeds

**Emily Wells.** (John E Johnson Award for Excellence in Research -2nd place poster winner). *Understanding the Role of PTEN in Src Recruitment and Inhibition by Cx43*, TriBeta Northeastern Region District 2 Convention 2023, April 2023
Faculty Mentor: Dr. Anastasia Thévenin

# Honors 2022-2023

## Spring 2022-Fall 2022 (Projects completed)

**Delanie Crabtree**
Advisor: Dr. Sara McClelland
Biology and Neuroscience
The Effects of an Ecologically Relevant Level of Malathion on the Behavior and Neurodevelopment of the Model Organism Northern Leopard Frog Tadpoles

**Scott Kornfeind**
Advisor: Dr. Sara McClelland
Biology
Understanding the Effects of Microplastics on Anuran Larval Development

**Tyler Rivera**
Advisor: Dr. Jeffrey Bush
Computational Neuroscience
Impacts of Synaptic Plasticity Within the Cerebellar Golgi Cell Circuit

## Fall 2022-Spring 2023 (Projects will be completed by the end of Spring 2023)

**Kaitlyn Austin**
Advisor: Angela Fraleigh
Studio Art
Frable Court - Exploration of Nostalgia, Emotions and Experiences Through the Lens of Childhood Memory

**Ariadae Baettcher**
Advisor: Dr. John Mikovits
Nursing
Examining Registered Nurses' Perceptions of Working with Nursing Colleagues Diagnosed with Mental Illness

**Austin Boguski**
Advisor: Dr. Rebecca Malinski
Sociology
A Mixed-Methods Study on Opioid Addicted Individuals

**Christina Carty**
Advisor: Dr. Robert LaRue
Africana Studies
The History of Sexuality Among Black Women

**Jillian Connelly**
Advisor: Dr. Joshua Lord
Biology
Impact of Ocean Acidification on Predator Avoidance Behavior in Shrimp

**Brooke Coonrod**
Advisor: Dr. Kara Mosovsky
Biology
Understanding the Mechanism of Seleno-L-Methionine Protection of Burkholderia-Infected Macrophages

**Garrison Koch**
Advisor: Dr. Nathan Shank
Mathematics
Evaluating Properties of Fractal Type Geometric Graphs

**Kyle Laub**
Advisor: Dr. Daniel Proud
Biology
Systematic Evaluation of Cosmetid Harvestmen

**Helen Meckstroth**
Advisor: Dr. Virginia Adams O'Connell
Sociology
Social Media Usage and Levels of Consumerism of College Students in the United States

**Matteo Montero**
Advisor: Dr. Robert LaRue
Women's, Gender and Sexuality Studies
Transsexual Sex Ed: Understanding Body, Identity, and the Self

**Chad Propst**
Advisor: Dr. Godfred Fianu
Chemistry
Titanocene (III) Catalyzed Syntheses and Study of Basic Motifs Found in Antitumor & Anti-inflammatory Agents

**Gabrielle Rader**
Advisor: Dr. Elise Colancecco
Nursing
Adolescent Mental Health: Effectiveness of Alternative Therapies

**Victoria Samuels**
Advisor: Dr. Curley Brenna
Statistics

How Added Sugar Affects Nutrient Intake in School-Aged Children

**Lila Shokr**
Camille Murphy
Graphic and Interactive Design
Ecological Impact of Experiential and Environmental Design: Sustainable Solutions

**Brian Utzat**
Drs. Eva Marikova Leeds and Axel Hildebrandt
German and Management
Covid-19 and the Impact on German and United States' Economy - A Case Study of Air Products

**Emily Wells**
Advisor: Dr. Anastasia Thévenin
Biochemistry
Src Inhibition by PTEN and Connexin 43 in Cancer Cells

**Frederick Younes**
Advisor: Dr. Stephen Dunham
Chemistry
Synthesis of Dirhodium Poly-L-Glutamate


Moravian University encourages persons with disabilities to participate in its programs and activities. If you anticipate needing any type of accommodation or have questions about the physical access provided, please contact Dave Leidich in the Art Office at leidichd@moravian.edu or 610-861-1622.