

MORAVIAN UNIVERSITY

20th Annual Undergraduate Scholarship and Creative Endeavors Week

April 14 - 18, 2025

This year, 58 students, representing 23 different major programs, are giving oral and poster presentations during the 2025 Scholarship and Creative Endeavors (SCE) Week activities. Many thanks to their 30 faculty sponsors.

Additionally, numerous talented art, music, and theater students will participate in performances and art exhibits in April.

Congratulations to these student scholars for all their accomplishments.

Acknowledgements

The 20th Annual Moravian University Undergraduate SCE Week 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:

Provost Carol Traupman-Carr

Deans Lesley Brown and James Scifers

Moravian Honors Program; Axel Hildebrandt, Honors Program Director

The Rokke Endowment for Student Research and the SOAR Program; Sarah Johnson, SOAR Program Director

Kim Demyan and Kris Beutler, Reeves Library

Angela Fraleigh, Department of Art; Neil Wetzel, Department of Music;
Christopher Shorr, Department of Theater

Michael Cook, Manager of Music & Art Operations

Deb Albors, Staff Assistant, Psychology Department

Undergraduate Research, Scholarship, and Creative Activities (URSCA)
Ambassador students:

Hailey Belverio, Emmanuel Bulted, Nikki Guido, Hailey Hoffman, AJ Minnich, Emma Pollackov, Giselle Ponce, Jorge Velazquez, Abigail Weiss, and especially Gwen Kester ('25), for her work on developing this student organization

Past Scholars Day/SCE coordinators:

Nathan Shank, Michelle Schmidt, and Diane Husic for their work to manage this celebration and promote undergraduate scholarship over the years

The UGRACE group who originally planned/organized this celebration in 2005: John Black, Dennis Glew, Carl Salter, Kay Somers, Anne Dutlinger, Jim Skalnik, Michelle Schmidt and Curt Keim

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MORAVIAN UNIVERSITY

Undergraduate Scholarship and Creative Endeavors Week

Oral and Poster Presentations General Schedule

Tuesday, April 15, 2025

8:20 – 9:00 a.m.

PPHAC 116

Session I: Oral Presentations

Noon – 1:00 p.m.

Reeves Library – First Floor

Poster Session I

3:00 – 4:00 p.m.

PPHAC 116

Session II: Oral Presentations

4:00 – 5:00 p.m.

Reeves Library – First Floor

Poster Session II

Wednesday, April 16, 2025

9:30 – 10:30 a.m.

PPHAC 116

Session III: Oral Presentations

11:00 – 11:40 a.m.

PPHAC 116

Session IV: Oral Presentations

Noon– 1:00 p.m.

Reeves Library – First Floor

Poster Session III

3:00 – 4:00 p.m.

PPHAC 116

Session V: Oral Presentations

Undergraduate Scholarship and Creative Endeavors Week

Come Celebrate with us!

Thursday, April 17, 2025

5:00 p.m. URSCA All-Stars Celebration Reception
Payne Gallery (Hurd campus)

	Celebrated student and	faculty URSCA ALL-STARS
Art	April Markland	Dr. MaryJo Rosania Harvie
Biology	Hailey Belverio	Dr. Anastasia Thevenin
Chemistry	Emmanuel Bulted	Dr. Alison Holliday
Global Religions	Daniel Alicea	Dr. Kin Cheung
Health Sciences/ Speech	Mary Jane (MJ) Granito	Dr. Colin Tomes
Pathology		Dr. Monica Kaniamattam
History (with MLL)	Nathan Pynchon	Dr. Richard Anderson
Mathematics	Geoffrey Kleinberg	Dr. Michael Fraboni
Modern Languages and		
Literatures (MLL)	Benjamin Born	Dr. Axel Hildebrandt
Music	Nick Mancini	Dr. Larry Lipkis
Neuroscience	Jorge Velazquez	Dr. Cecilia Fox
Nursing	Kayla Biege	Dr. Elise Colancecco
Philosophy	Brian Demyan	Dr. Arash Naraghi
Physics	John Riley	
Political Science	Brooke Gormley	Dr. Khristina H. Haddad
Psychology	Jill Bauer	Dr. Sarah Johnson
Public Health	Abigail Weiss	Dr. Cathy Coyne
Sociology	Jayden Bruch	Dr. Rebecca Malinski
Theatre	Colin Core	Prof. Christopher Shorr

6:00 p.m. Kappa Pi International Art Honor Society Inductions and Senior Thesis Exhibition opening
Payne Gallery (Hurd campus)

Presentations - Detailed Schedule

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

Tuesday, April 15, 2025

ORAL SESSION I

Oral Presentations Session I: Moderator – Dr. Mike Fraboni PPHAC 116			
8:20 AM	Geoffrey Kleinberg	Mathematics	Dr. Michael Fraboni
<i>Graph q-Pebbling</i>			
8:40 AM	Nikki Guido	Chemistry Education	Drs. Shari Dunham & William Farina
<i>Do Rewards Matter for Student Participation in Optional Laboratory Skills Assessments?</i>			

ORAL SESSION II

Oral Presentations Session II Moderator – Dr. Claudia Mesa PPHAC 116			
3:00 PM	María Barrena González	Spanish Cinema	Dr. Claudia Mesa
<i>The Problematic Classification of Almodóvar's <i>Átame!</i>: Between Pornography, Romantic Comedy and Psychological Horror</i>			
3:20 PM	Domenica Capuz	Spanish Literature	Dr. Claudia Mesa
<i>Emotions for Within: The fragmentation of the individual and the religious self in Santa Teresa's "El libro de la vida."</i>			
3:40 PM	Santoshi Mutyala	Biological Sciences	Dr. Sara McClelland
<i>Biological Effects of Trace Organophosphates on Larval Amphibians</i>			

POSTER SESSION I

12:00 - 1:00 PM Poster Presentations I Reeves Library - First Floor		
Student(s)	Project Discipline	Advisor(s)
Zachery Bingaman & Deborah Rabonivich <i>Generating biologically realistic neuron models using machine learning</i>	Computer Science, Neuroscience & Math	Dr. Jeffrey Bush
Jeanna DiAngelis <i>Analyzing the julius seizure Gene in D. melanogaster</i>	Biology	Dr. Christopher Jones
Mayzi Edelheiser <i>Live Wire: What Connects "The Awakening," "Trifles," and "A Doll's House"</i>	English	Dr. Andrew Crooke
Brooke Gormley <i>How We "Never Forget:" American Representations of 9/11</i>	Political Science	Dr. Khristina H. Haddad
Virginia Jacobsen Abigail Angelisanti, Ryan Kulp & Sophia Shienvold <i>Assessing Protein-Protein Interactions between Src and Cx43 Mutants of the Novel Threonine 290 Phosphorylation Site</i>	Biochemistry	Dr. Anastasia Thevenin
Ryan Kulp <i>Does Phosphorylation on Threonine 290 Regulate Cx43/Src Interaction?</i>	Biochemistry	Dr. Anastasia Thevenin
Truong Le <i>Synthesis and Characterization of Dirhodium Valproate Complexes for Enhanced Anticancer Effectiveness</i>	Medicinal, Pharmacology, Analytical	Dr. Stephen Dunham
Alexandra McDevitt <i>The Detection of Chlorpyrifos in Golf Courses</i>	Analytical Chemistry	Drs. Alison Holliday & Colleen Payton
Emma Pollackov <i>Analyzing Anti-Predator Responses of Tadpoles after Chronic Exposure to Nanoplastics</i>	Biology, Ecology	Dr. Sara McClelland
Giselle Ponce-Bautista <i>Microhabitat factors influencing shrub encroachment into coastal grasslands</i>	Biology	Dr. Natasha Woods
Brianna Swinkowski <i>Personality and Mobbing Behavior in Shrimp During Predator Interactions</i>	Marine Biology	Dr. Josh Lord
Adelaide Treibley <i>The Determination of Lead In Tattoo Ink</i>	Chemistry	Dr. Alison Holliday
Rebecca Uwase <i>Analysis of Δ^8- and Δ^{10}-THC in Commercial Products using Liquid Chromatography-Mass Spectrometry</i>	Chemistry	Dr. Alison Holliday

POSTER SESSION II

4:00 - 5:00 PM Poster Presentations II Reeves Library - First Floor		
Student(s)	Project Discipline	Advisor(s)
Mariam Abdalla <i>Protein-Protein Interaction Studies Between Purified Cx43CT and Fluorescently-tagged ZO-1</i>	Biochemistry	Dr. Anastasia Thévenin
Abigail Angelisanti <i>Direct Phosphorylation by Mitogen-Activated Protein Kinases Prevents Cx43-Src Interaction</i>	Biochemistry	Dr. Anastasia Thévenin
Kayla Biege <i>The Impact of Caring for Patients with Left Ventricular Assist Devices (LVADs) on Nurses' Psychological Health</i>	Nurse Mental Health, Complexity of Care	Dr. John Mikovits
Laurie-Anna Bienaime <i>Impact of Morella cerifera root exclusion on Sporobolus pumilus growth in coastal grasslands</i>	Biology	Dr. Natasha Woods
Matthew Braun <i>Mobbing Behavior in Grass Shrimp</i>	Biology	Dr. Josh Lord
Zuri Foell <i>Weaving Dual Identities: Artistic Exploration in Filipino-American Heritage and Bi-Racial Narratives</i>	Art & Culture	Prof. Natessa Amin
Jacob (Coby) Gumulak Nicholas (Nick) Mancini <i>Rediscovering the Hollywood Saxophone Quartet</i>	Music	Dr. Neil Wetzel
Maria Lubbos <i>Proud's Lab 2024 Field Exhibition: Harvestmen (Opiliones) Collection in Costa Rica</i>	Biology & Environmental Science	Dr. Daniel Proud
Edward Nuber <i>Fluorescence studies of the disruption of G-quadruplexes by 6-thioguanine</i>	Biochemistry	Dr. Stephen Dunham
Emily Nyce <i>Timing of post-storm rainfall and its influence on Morella cerifera expansion on coastal barrier islands</i>	Environmental Science	Dr. Natasha Woods
Mary Jane Granito Emily Tucker <i>Insights from Indian Immigrants on Patient-Centered Rehabilitation: An International Collaboration</i>	Speech Language Pathology	Dr. Monica Kaniamattam
Jorge Velazquez <i>Impact of Acute Fluoxetine (Prozac) Exposure on Hierarchy Formation in Shrimp</i>	Environmental Science	Dr. Josh Lord
Brianna Whalen <i>Salinity and Burial Impact Juvenile and Seedling Stages of Morella cerifera</i>	Biology	Dr. Natasha Woods

Wednesday, April 16, 2025

ORAL SESSION III

Oral Presentations Session III Moderator – Dr. Danielle Constanza PPHAC 116			
9:30 AM	Fatima Bouri	English & Womens' Gender Studies	Dr. Robert LaRue
<i>Socioeconomic Stream of Consciousness: Virginia Woolf and Her Relationship to Capitalism</i>			
9:50 AM	Hailey Hoffman	Environmental Science, Biology	Dr. Daniel Proud
<i>Using Ultraconserved Elements to Reconstruct the Evolutionary History of Akdalima (Opiliones: Samoidae)</i>			
10:10 AM	AJ Minnich	English and Rhetoric	Profs. Chris Hassay & Liz Gray
<i>An Exploration of Video Game Narratives in Connection to Rhetorical Agency</i>			

ORAL SESSION IV

Oral Presentations Session IV Moderator – Prof. Liz Gray PPHAC 116			
11:00 AM	Johnathan Dowling	Health Sciences	Prof. Liz Gray
<i>Hungry for Change: Moravian's Limited Dining Options for Restricted Diets</i>			
11:20 AM	Abigail Weiss	Public Health	Dr. Cathy Coyne
<i>Evaluating the Psychological Impact of Parental Substance Use on College Students</i>			

ORAL SESSION V

Oral Presentations Session V Moderator – Dr. Steve Dunham PPHAC 116			
3:00 PM	Hailey Belverio	Biochemistry	Dr. Anastasia Thevenin
<i>Mutually-exclusive interaction of Connexin 43 with Src and ZO-1 is Regulated through a Single Phosphorylation Event</i>			
3:20 PM	Tyler Kokie	Chemistry	Dr. Stephen Dunham
<i>RHPLG chemo agents</i>			
3:40 PM	Sarah Rice	Running Biomechanics	Drs. Michael Steimling & Kathleen Madara
<i>An Investigation into Body-Weight Supported Treadmill Running on Ground Reaction Forces Utilizing A Single Subject Design</i>			

POSTER SESSION III

12:00 - 1:00 PM Poster Presentations III Reeves Library - First Floor		
Student(s)	Project Discipline	Advisor(s)
Jenna Azar <i>Synthesis of Diphenylamino Ketones as Precursors for Radical Arylation</i>	Organic Chemistry	Dr. Godfred Fianu
Deb Bhattacharyya <i>Investigating the Effects of Spatial and Temporal Visual Feedback Distortions on Reach-to-Grasp Movements Using Leap Motion Tracking</i>	Neuroscience & Biomechanic	Dr. Luis Schettino, Lafayette C.
Deb Bhattacharyya Evan Stoudt <i>Movie Soundtracks and Effects on Viewers</i>	Psychology	Dr. Sarah Johnson
Evan Bulette <i>Partition Coefficients of Dirhodium compounds using HPLC</i>	Biochemistry, Chemistry, Biology	Drs. Stephen & Shari Dunham
Mia Espinal <i>Species Composition Research on Hog Island</i>	Biology	Dr. Natasha Woods
Makayla Excell <i>Showdowns in the Salt Marsh: Investigating Mobbing Behavior in Aggressive Grass Shrimp</i>	Biology	Dr. Josh Lord
Elina Georges <i>A Rapid Screening Method for Biomolecule Binding of Rhodium Complexes</i>	Biochemistry	Dr. Shari Dunham
Glorianny Mosquea <i>Grass Shrimp Unite Against a Common Enemy</i>	Marine Biology	Dr. Josh Lord
Margie Rayne <i>Habitat-Specific Mobbing Behavior of Grass Shrimp in Response to Blue Crabs</i>	Biology	Dr. Josh Lord
Prince Sokpo <i>Exploring Relationships Between 'Personality' and Dominance Hierarchies in Shrimp (Palaemon pugio)</i>	Biology	Dr. Josh Lord
Andrew Unangst <i>Synthesis of dirhodium carboxylate compounds</i>	Chemistry, Biochemistry	Dr. Stephen Dunham
Mikayla-Anne Woodring <i>Morphological Changes in Xenopus laevis Tadpoles' Guts When Exposed to Polyethylene Microplastics in Water</i>	Biology & Environmental Science	Dr. Sara McClelland
Andrew Younes <i>A Comparison of CME and CIR Geomagnetic Storms Using ENA Measurements</i>	Physics	Dr. Keith Wood
Johanna Zimmerli <i>Extraction and Quantification of Fluoxetine (Prozac) in Seawater</i>	Analytical Chemistry	Dr. Alison Holliday

Schedule of Creative Events

Moravian University Department of Music Student Concert Schedule

(See also: <https://www.moravian.edu/music/concert-schedule>)

Friday & Saturday, April 11 & 12, 2025 (7:30 PM): *Students in Recital*

Moravian University Dance Concert

Lisa Busfield, artistic director, & Karen Riehl, assistant director

Foy Concert Hall – Hurd Campus, Moravian University

Tickets - General admission \$15 <https://cur8.com/19817/project/129993>

Also available at the door; Free with Moravian ID.

Saturday, April 12, 2025 (7:30 PM): *Student Recital*

Samuel Lingen, baritone

Peter Hall – Hurd Campus, Moravian University; No admission charge

Join Samuel Lingen as he takes the stage of Peter Hall one last time as a student! Accompanied by Bram Rader, Sam will present a diverse program of pieces by a variety of composers. The first half of the program will include works by figures such as Händel, Wolf, Poulenc, and Ives (and more!); the second half will showcase Vaughan Williams' Songs of Travel. Don't miss out on this special night!

Sunday, April 13, 2025 (7:00 PM): *Student Composers*

Moravian University Composers' Concert

Dr. Larry Lipkis, director

Foy Concert Hall – Hurd Campus, Moravian University; No admission charge

Monday, April 14, 2025 (7:00 PM): *Student Ensembles*

Moravian University Trombone Ensemble

Ralph Brodt III, director

Peter Hall – Hurd Campus, Moravian University

General Admission: \$15 / Seniors & Students: \$10

Tuesday, April 22, 2025 (7:00 PM): *Student Presentation*

Nick Mancini - Independent Study Presentation

"Troubadour"

F Hall - Hurd Campus, Moravian University; No admission charge

A presentation of original songs written and recorded by Nick Mancini & performed by the talented music students of Moravian University.

Friday, April 25, 2025 (7:30 PM): *Student Recital*

Joshneil Ferguson, jazz piano

"The World Through My Eyes"

Foy Concert Hall – Hurd Campus, Moravian University; No admission charge

Saturday, April 26, 2025 (7:30 PM): *Students Ensembles*

Moravian University Choral Ensembles

featuring Carl Orff's Carmina Burana

Dr. Paula Zerkle, director

Foy Concert Hall – Hurd Campus, Moravian University

General Admission: \$15 / Seniors & Students: \$10

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Moravian University Art Department Student Event Schedule

Friday, April 11, 2025 (1:00-4:00 PM): *Student Portfolio Presentations*

Moravian Art Department + AAFGLV Adventures Event

Dr. Katie Desiderio Keynote; Students portfolio presentations

Ben Franklin Tech Ventures- 4th floor

116 Research Dr, Bethlehem, PA 18015

April 17th – May 3rd, 2025: *Senior Thesis Exhibition*

Opening Reception: Thursday April 17, 2025 (6:00 - 8:30pm)

Payne Gallery – Hurd Campus, Moravian University

Students presenting:

Alosaimi, Maha

Angelone, Julianna

Curtis, Tatiana

DeCaro, Elliot

Dresher, Hannah

Fitzgerald, Kerry

Foell, Zuri

Kaplan, Samantha

Komosinski, Tyler

Markland, April

Moody, Hannah

Morales, Faith

Savitski, Lauralie

Turkdonmez, Sara

Valenzuela, Jakelyn

Vu, Kim

Thursday, April 17, 2025 (6:00 PM): *Student Honors Induction*

Kappa Pi Art Honors Induction Presentation

Payne Gallery – Hurd Campus, Moravian University

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Moravian University Department of Art Spring Student Event Schedule

(See also: <https://www.moravian.edu/theatre/season>)

Friday, February 21, 2025: "Time Stuck"

An original play by Josiah Delpezzo

Presented as a staged reading

Directed by Lexi Jordan

Time Stuck is a show that follows Tom and Lucy who are stuck within their past. They can't let it go to live in the present due to being trapped in a disjointed reality that manifests from their memories. Time Stuck makes us think about these memories from childhood and how events from our past affect our lives in the present.

Thursday, March 27 – Sunday, March 30, 2025: "Chameleon"

An original play written and directed by Colin Core

What's the harm in acting as someone else? The story follows an actor who realizes they don't have to stop acting if they mimic the wacky characters around them in order to get through the social situations life throws at them. Including, but not limited to, using that customer service voice to have "friendly" conversations, pretending to be in a frat for that sense of community, or using political debates to argue that their favorite album is better than yours. Never leaving the stage is a great way to feel assured. "Is it ever okay to be yourself?" "Can anyone ever truly be genuine?" "Can this false sense of pretending even fool yourself?" Raising these questions and more, it'll sure make you think about people, which isn't that what theatre is all about?



April 11 – April 13, 2025 (open during Moravian writers conference hours):

Whispered Hopes and Fears: An Interior Monologue Soundscape

Created by professor Christopher Shorr with material generated by Moravian students.

PPHAC 103

The "Whispers" Soundscape turns inner thoughts into an immersive, shared experience. This collaborative soundscape blends art and science, communication, emotion and exploration. The Moravian Writers Conference team and the Moravian Theatre Company present a soundscape of whispered thoughts, curiosities, hopes and fears that fill a shared space. Together, these voices will create a layered, dreamlike environment where the "inside" voices we all carry are brought into the "outside" world. Visitors will be invited to walk through and listen to a chorus of thoughts and then respond to the experience through a community art piece that will be developed throughout the duration of the two-day writers' conference.

WHISPERED HOPES & FEARS

An Interior Monologue Soundscape

The "Whispers" Soundscape turns inner thoughts into an immersive, shared experience, blending art and science, communication, emotion and exploration.

Students' curiosities, hopes and fears will create a layered, dreamlike environment where the "inside" voices we all carry are brought into the "outside" world.

**April 11-13
PPHAC 103**



WHISPERED HOPES & FEARS

An Interior Monologue Soundscape

Created by Christopher Shorr

The words and voices in this soundscape belong to Moravian students

STUDENT CONTRIBUTORS

Hashim Ali	Shayaan Farhad	Ayleen Mexquitilla
Sherry Anderson	Alexa Fernandez	Emily Nyce
Kaitlyn Arnone	Mariela Greenawald	Lola Offenback
Johnny Baron	Connor Grove	Allison Pittnick
Halley Belverio	Madeline Grullon	Ryan Rismiller
Sean Boyer	Caleb Gurkile	Simran Sidhu
Talia Collina	Abigail Haelig	Adria Silbert
Josiah Dalpezzo	Alexander Harrison	Kennedy Simons
Neveah Dajesus	Josh Hecklin	Sean Singh
Sarah DeStefano	Nicole Hurt	Kady Smith
Robert Dominick	Jacob Hyatt	Ella Sporka
Amro Elkelany	Lexi Jordan	Kaylee Thomas
Jinu Engels	Ryanna Kral	Roman Verdicchio
Makyla Excell	Amira Lane	Emma Ward
Emma Fastiggi	Arianna Lopresti	Holly Wiener

Friday, April 11, 2025: *The Hound Show*

The Moravian University Theatre company student Cabaret

Directed by Emma Ward

Bahnson Center Saal

Join fellow hounds as they share their talent in an evening of music and comedy.

Moravian-hosted Undergraduate Student Conferences/Exhibits (2024-25)

2025 Art Department Senior Thesis Exhibition, Payne Gallery, opening April 17th (6 PM)

Students (seniors) will be exhibiting their year-long research and creative projects: Maha Alosaimi, Julianna Angelone, Tatiana Curtis, Elliot DeCaro, Hannah Drescher, Kerry Fitzgerald, Zuri Foell, Samantha Kaplan, Tyler Komosinski, April Markland, Hannah Moody, Faith Morales, Lauralie Savitski, Sara Turkdonmez, Jakelyn Valenzuela, and Kim Vu

Moravian Student Mathematics Conference, February, 2025

Coordinated by Moravian Department of Mathematics & Computer Science and the Pennsylvania Omicron (Moravian University) chapter of Pi Mu Epsilon, student members: Victoria Harper, Geoffrey Kleinberg, Liam Reinert, John Riley, Krissy Wolf, & Andrew Younes

<https://sites.google.com/moravian.edu/studentmathematicsconference>



Moravian “Write to Explore” Conference, April 2025

Kate Brandes & Liz Gray, Co-Directors

<https://www.moravian.edu/writersconference>

Undergraduate Student Conference Presentations (2024-25)

The Joint Meeting of Ichthyologists and Herpetologists, Pittsburgh, PA, July 2024

Emma Pollackov. *Analyzing Anti-Predator Responses of Tadpoles after Chronic Exposure to Microplastics.* Faculty advisor: Sara McClelland

Santoshi Mutyala & Delanie Crabtree. *Neurodevelopmental Impacts of Organophosphates on Late-stage Amphibian Larvae.* Faculty advisor: Sara McClelland

Landmark Conference Summer Research Symposium, Juniata College, July 2024

Nicolette Guido. *Evaluating General Chemistry Laboratory Skills through Evidence-Based Assessments.* Faculty advisor: Shari Dunham

Santoshi Mutyala. *Neurodevelopmental Impacts of Organophosphates on Late-Stage Amphibian Larvae.* Faculty advisor: Sara McClelland

Emma K. Pollackov. *Analyzing Anti-Predator Responses of Tadpoles after Chronic Exposure to Nanoplastics.* Faculty advisor: Sara McClelland

Andrew Younes. *A Comparison of CME and CIR Geomagnetic Storms Using ENA Measurements.* Faculty advisor: Keith Wood

Health Datapalooza, Washington, DC, September 2024

Kaleb Missmer. *Harness AI: Interactive Demo on Public Comments for Marijuana/Psychedelics Rules.* Faculty advisor: Benjamin Coleman

Jazz Educators Network Conference, Atlanta, GA, January 2025

Coby Gumulak & Nick Mancini. *Researching and Resurrecting the Music of the Hollywood Saxophone Quartet.* Faculty advisor: Neil Wetzel

Moravian Student Mathematics Conference, Moravian University, February 2025

Zachery Bingaman & Deborah Rabinovich. *From Math to Membranes.* Faculty advisor: Jeffrey Bush

Association of Southeastern Biologist Meeting, Myrtle Beach, SC, March 2025

Giselle Ponce. *Microhabitat factors influencing shrub encroachment into coastal grasslands.* Faculty advisor: Natasha Woods

Brianna Whalen. *Impact of burial and salinity on seedling and juvenile growth of Morella cerifera in coastal ecosystems.* Faculty advisor: Natasha Woods

Pennsylvania Speech-Language-Hearing Association Convention, Pittsburgh, PA, March 2025

Mary Jane Granito. *Insights From Indian Immigrants on Patient-Centered Rehabilitation: An International Collaboration.* Faculty advisor: Monica Kaniamattam

Eastern Psychological Association Annual Meeting, New York, NY, March 2025

Veronica Kromer & Jill Bauer. *Gender and Racial Representation in Children's Picture Books about Science.* Faculty advisors: Sarah Johnson & Stacey Zaremba

Benthic Ecology Meeting, Mobile, AL, April 2025

Makayla Excell. *Showdowns in the Salt Marsh: Investigating Mobbing Behavior in Aggressive Grass Shrimp.* Faculty advisor: Joshua Lord

Glorianny Mosquea Luciano. *Grass Shrimp Unite Against a Common Enemy.* Faculty advisor: Joshua Lord

Margie Rayne. *Habitat-Specific Mobbing Behavior of Grass Shrimp in Response to Blue Crabs.* Faculty advisor: Joshua Lord

Prince Sokpo. *Exploring Relationships Between 'Personality' and Dominance Hierarchies in Shrimp.* Faculty advisor: Joshua Lord

Brianna Swinkowski. *Personality and Mobbing Behavior in Shrimp in Response to a Fish Predator.* Faculty advisor: Joshua Lord

Jorge Velazquez. *Impact of Acute Fluoxetine (Prozac) Exposure on Hierarchy Formation in Shrimp.* Faculty advisor: Joshua Lord

Collaborative Perspectives on Addiction Conference, Providence, RI, April 2025

Abigail Weiss. *Evaluating the Psychological Impact of Parental Substance Use on College Students.* Faculty advisor: Cathy Coyne

National Conference on Undergraduate Research, Pittsburgh, PA, April 2025

Jenna Azar. *Synthesis of 1-(Diphenylamino)-2-propanone and 1-(phenyl(p-tolyl)amino)propan-2-one for Radical Arylation Studies.* Faculty advisor: Godfred Fianu

Hailey Belverio. *Mutually-Exclusive Interaction of Connexin 43 with Src and ZO-1 is Regulated through a Single Phosphorylation Event.* Faculty advisor: Anastasia Thevenin

Keyana Bradshaw. *The Use of a *Granisotoma rainieri* Antifreeze Protein to Cryopreserve *Drosophila melanogaster* Eggs.* Faculty advisor: Chris Jones

Emmanuel Bulted. *Synthesis and Characterization of Mixed Carboxylate Ligand Rhodium Complexes.* Faculty advisor: Stephen Dunham

Nicolette Guido. *Do Rewards Matter for Student Participation in Optional Laboratory Skills Assessments?* Faculty advisor: Shari Dunham

Mary Jane Granito. *Enhancing Cultural Competence Through an International Collaborative Project Exploring the Experiences of Asian Indian Immigrants in Patient-Centered Rehabilitation.* Faculty advisor: Monica Kaniamattam

Yousuf Kanan. *Accelerating Simulations of Strongly Correlated Systems with OpenMP Parallelization.* Faculty advisor: Chinedu Ekuma, Lehigh U.

Giselle Ponce-Bautista. *Characterization of the Microhabitat of Encroaching Shrub *Morella cerifera*.* Faculty advisor: Natasha Woods

Sarah Rice. *An Investigation into Body-Weight Supported Treadmill Running on Ground Reaction Forces Utilizing A Single Subject Design.* Faculty advisor: Michael Steimling

Abigail Weiss. *Examining the Psychological Impact of Parental Substance Use on College Students in 2024.* Faculty advisor: Cathy Coyne

Brianna Whalen. *The impact of disturbance on the growth of *Morella cerifera* at different life stages.* Faculty advisor: Natasha Woods

Ryan Younes. *Remembering Stereotypes: The Influence of Implicit Biases on Sexual Minorities.* Faculty advisor: Sarah Johnson

Excellence in Reporting on Diversity, Equity and Inclusion, Pennsylvania NewsMedia Association - Honorable Mention accolades for the accomplishments of The Comenian:

“Diversity Turned Derogatory: How DEI Became an Unusual Controversy” by Fatimah Bourri
comenian.org/11444/opinions/diversity-turned-derogatory-how-dei-has-become-an-unusual-controversy/

“1,000 Days of War: Stories from Moravian's Ukrainian Community” by Sofia Savenko
<https://comenian.org/11942/news/1000-days-of-war-stories-from-the-ukrainian-community-in-bethlehem-pa/>

“R.E.D.I. R.I.S.E: Celebrating Women's Excellence through One Excellent Professor” by Todd Reedy
<https://comenian.org/10775/news/r-e-d-i-r-i-s-e-celebrating-womens-excellence-through-an-excellent-woman/>

Students—interested in seeing graduate level research presentations?

Come to the College of Health

2025 Graduate Research Symposium and Clinical Appreciation Event

On **April 30th at 6- 8:30pm in the Sports Medicine and Rehabilitation Center (SMRC)**, the College of Health is hosting our annual Graduate Research Symposium and Clinical Appreciation Event. There will be poster presentations by graduating students of the Master of Science in Nursing, Master of Science in Athletic Training, Master of Science in Occupational Therapy, Master of Science in Speech Language Pathology and Post Professional Occupational Therapy Doctorate. Community partners of the college will be recognized during an award ceremony.

6:00 pm- Welcome / Meet & Greet in Lobby (appetizers and drinks for attendees)

6:10 pm- Poster Presentations I

6:55 pm- Clinical Education Awards

7:30 pm- Poster Presentations II

8:15 pm - Closing

Honors Projects 2024-2025

Spring 2024-Fall 2024 (Projects completed)

<u>Student</u>	<u>Discipline Area for Honors</u>	<u>Faculty Advisor(s)</u>
Jean-Pierre Appel	Computer Science & Mathematics	Benjamin Coleman & Shannon Graham-Talbott
<i>Analysis of Total Domination Algorithms on Graphs</i>		
Santoshi Mutyala	Biology	Sarah McClelland
<i>Malicious Malathion: Testing the Biological Impacts of Exposure to a Micro Concentration of a Common Organophosphate</i>		

Fall 2024-Spring 2025 (Projects will be completed by the end of Spring 2025)

<u>Student</u>	<u>Discipline Area for Honors</u>	<u>Faculty Advisor(s)</u>
Hailey Belverio	Biochemistry	Anastasia Thévenin
<i>Mutually-Exclusive Interaction of Connexin 43 with Src and ZO-1 in Healthy and Cancer Cells</i>		
Kayla Beige	Nursing	John Mikovits
<i>The Impact of Caring for Patients with Left Ventricular Assist Devices on Nurses' Psychological Health</i>		
Keyana Bradshaw	Biology	Christopher Jones
<i>Using CRISPR to Deliver Tardigrade Genes to Drosophila melanogaster Eggs in an Attempt to Breed Drosophila melanogaster That Can Be Cryogenically Frozen, Thawed, and Returned to an Active State</i>		
Elliot DeCaro	Fine Arts	Angela Fraleigh
<i>Identity in Society</i>		
Nick DiVittorio	Neuroscience	Sara McClelland
<i>Malathion Exposure's Effect on Amphibian Neurodevelopment</i>		
Brooke Gormley	Political Science	Khristina Haddad
<i>Grief and Politics: The Communication of 9/11</i>		
Caleb Gunkle	Biology	Daniel Proud
<i>Reconstructing the Evolutionary History of Cosmetid Harvesters (Opiliones: Laniatores: Cosmetidae) in Costa Rica Using Ultraconserved Elements</i>		
Hailey Hoffman	Environmental Studies	Daniel Proud
<i>Using Ultraconserved Elements to Reconstruct the Evolutionary History of Akdalima (Opiliones: Samoidae)</i>		
Geoffrey Kleinberg	Mathematics	Mike Fraboni
<i>Pebbling Number and Related Problems in Graph Theory</i>		
Ryan Kulp	Biochemistry	Anastasia Thévenin
<i>Phosphorylation at Threonine 290 as Regulatory Switch for Cx43 Ubiquitination and Degradation</i>		
Samuel Lingen	Music	Larry Lipkis
<i>The Analysis and Orchestration of Four Late 19th and 20th Century Works from the Art Song Repertory</i>		
Catherine Lovett	Nursing	Karen Groller & Elise Colancecco
<i>The Effect Obesity Has on Care in the Intensive Care Unit (ICU)</i>		
Abigail McClaskey	Nursing	Elise Colancecco
<i>Exploring Nurses' Perceived Challenges Surrounding Organ Donation</i>		
Alexandra McDevitt	Chemistry	Alison Holliday
<i>The Detection of Chlorpyrifos Insecticide on Golf Courses</i>		

Alexandra Meeks	Nursing	Shirley Guider
<i>Can Awareness and Education about Brca Help Young Adults Decide to Have Genetic Testing Done to Evaluate Their Risks for Cancer Inheritance?</i>		
Andrew (AJ) Minnich	English & Rhetoric	Liz Gray & Chris Hassay
<i>Metanarratives in Video Games: The Rhetoric of Decision Making and Transformative Narratives in Interactive Media</i>		
Emma Pollackov	Biology	Dr. Sara McClelland
<i>Physiological Effects of Polyethylene Microplastics on the Guts of Tadpoles</i>		
John Riley	Physics	Dr. Keith Wood
<i>Determining Three-Dimensional Current Distributions in the Earth's Inner Magnetosphere Under Geomagnetic Storm Conditions Using ENA Measurements from TWINS</i>		
Prince Sokpo	Biology	Dr. Joshua Lord
<i>Relationship between Anti-predator Behavior and 'Personality' in Shrimp</i>		
Rebecca Uwase	Chemistry	Dr. Alison Holliday
<i>Analysis of $\Delta 8$- and $\Delta 10$-THC in Commercialized Hemp Products using Liquid Chromatography-Mass Spectrometry</i>		
Jorge Velazquez	Biology	Dr. Joshua Lord
<i>Measuring Monoamine Mediation of Mobbing Behavior in Grass Shrimp</i>		
Abigail Weiss	Public Health	Dr. Cathy Coyne
<i>The Impact of a Substance Use Disorder on Immediate Family Members</i>		
Brianna Whalen	Biology	Dr. Natasha Woods
<i>The Impact of Disturbance on the Growth of Morella Cerifera Seedlings</i>		
Taylor Yoder	Nursing	Dr. John Mikovits
<i>Impact of Sports-Related Injury on Athlete Mental Health: A Nursing Perspective</i>		
Ryan Younes	Neuroscience	Dr. Sarah Johnson
<i>Remembering Stereotypes: The Influence of Implicit Biases Towards Sexual Minorities</i>		

SOAR Projects 2024-2025

Fall 2024

Socioeconomic Stream-Of-Consciousness: Virginia Woolf and Her Relationship with Capitalism
Fatimah Bouri & Dr. Robert LaRue

Summer 2024

Weaving Dual Identities: Artistic Exploration in Filipino-American Heritage and Bi-Racial Narratives
Zuri Foell & Prof. Natessa Amin

Grief and the American President: A Comparison of Personal Grief Narratives to Public Addresses of Tragedy
Brooke Gormley & Prof. Liz Gray

Evaluating Science Laboratory Skills Through Evidence-Based Assessments
Nikki Guido & Dr. Shari Dunham

Researching and resurrecting the music of the Hollywood Saxophone Quartet
Jacob Gumulak, Nicholas Mancini & Dr. Neil Wetzel

Does Phosphorylation of Connexin 43 on Threonine 290 Regulate its Interaction with Nedd4 Ubiquitin Ligase?
Ryan Kulp & Dr. Anastasia Thevenin

An Exploration of Rhetorical Agency in Gameplay and College-Level Writing Contexts
Andrew (AJ) Minnich & Dr. Crystal Fodrey

The neuroanatomical impacts of exposure to low, environmentally realistic concentrations of a common organophosphorus pesticide
Santoshi Mutyala & Dr. Sara McClelland

Assessing the Behavioral Impacts of Chronic Exposure to Microplastics
Emma Pollackov & Dr. Sara McClelland

An investigation of the differences between running with and without body weight support on heart rate, muscle activity, and running kinematics in collegiate runners
Sarah Rice & Dr. Michael Steimling

Analysis of $\Delta 8$ - and $\Delta 10$ -THC in Commercial Products using Liquid Chromatography-Mass Spectrometry
Rebecca Uwase & Dr. Alison Holliday

Titanocene(III) Borohydride Catalyzed Reduction of Nitriles to Amines
Jorge Velazquez & Dr. Godfred Fianu
Co-sponsored by the Center for Inclusive Excellence

A Comparison of Strong CME and CIR Geomagnetic Storms
Andrew Younes & Dr. Keith Wood

Scholarship and Creative Endeavors Week

ABSTRACTS

Student Oral Presentations I

Title: Do Rewards Matter for Student Participation in Optional Laboratory Skills Assessments?
Student(s): Nikki Guido
Advisor(s): Drs. Shari U. Dunham & William Farina

Students come to a college General Chemistry course with a range of experience with hands-on laboratory skills. Differences in prior experience can be exacerbated when introductory laboratory experiments are done in groups where each student may not perform each hands-on skill for completion of the experiment. To probe student prior experience and assess their achievement of basic hands-on laboratory skills, we designed and modified four authentic skills assessments. These assessments require students to record and submit a narrated video of themselves properly performing that skill. Students were queried about their experience and confidence level with each skill prior to the course and following each video assignment. Laboratory skill assessment modules were deployed in a large (n=89) General Chemistry 1 course in the fall of 2024 to investigate student motivation for completing these assignments. Throughout the fall semester, students in each laboratory section of the course earned credit and some earned an additional reward (digital badge or physical sticker) for successful completion of each module. Student data on participation, successful completion of modules, and pre/post-survey responses were analyzed. Changes in student confidence and experience with each laboratory skill will be presented, and impact of rewards on student completion will be discussed.

Title: Graph q-Pebbling
Student(s): Geoffrey Kleinberg
Advisor(s): Dr. Michael Fraboni

Graph q-pebbling is a single player game played on a connected graph. The q-pebbling number of a graph, denoted $\pi_q(G)$ is the lowest number m such that, no matter how m pebbles are distributed among the vertices of the graph, a pebble can be moved to any vertex by a sequence of moves, where each move consists of removing q pebbles from one vertex and adding 1 pebble to an adjacent vertex. We show several bounds on $\pi_q(G)$ for arbitrary graphs, and compute $\pi_q(G)$ exactly for certain classes of graphs.

Student Oral Presentations II

Title: The Problematic Classification of Almodóvar's *Átame!*: Between Pornography, Romantic Comedy and Psychological Horror
Student(s): María Barrena González
Advisor(s): Dr. Claudia Mesa

When it was first released, Almodovar's 1989 film, *Átame!* (Tie Me Up! Tie Me Down! in the English version), was given an X rating by the MPAA (Motion Picture Association of America). After the acclaimed Spanish director challenged this rating in court, it was changed to NC-17 "for scenes of strong adult sensuality with nudity." Interestingly enough, the NC-17 classification was created, because of the issues surrounding this film. Although *Átame!* has been labeled as "comedy," "dark comedy," "romance," and "drama," I find these kinds of categorization problematic due to the highly controversial topics portrayed throughout the movie. *Átame!* follows the unconventional love story of Marina, a former adult actress, and Ricky, her stalker who kidnaps her with the aim of showing that no one will ever love her as much as he does. In this presentation, I question the labeling of *Átame!* as a romantic comedy to propose that the movie is better characterized as a psychological horror film in which its female protagonist becomes a victim of her charming, yet dangerous, stalker. Please note that this presentation will be in Spanish. With discussion in English and Spanish.

Title: Emotions for Within: The fragmentation of the individual and the religious self in Santa Teresa's "El libro de la vida."
Student(s): Domenica Capuz
Advisor(s): Dr. Claudia Mesa

This essay explores the duality of religious and feminine identity in "El libro de la vida" by Santa Teresa de Jesús. Although the text was written as a spiritual autobiography, it reveals restrained emotions and desires expressed through mystical language. Santa Teresa's visions, particularly the piercing of her entrails by a cherub's golden arrow, symbolize both divine ecstasy and repressed human longing. This essay draws on Patricia Fernández Martín's analysis to argue that Santa Teresa uses metaphorical and symbolic expressions to navigate the patriarchal restrictions placed on women, especially within religious institutions. Santa Teresa constructs two selves: a devout, obedient religious self and a silenced, yet present, feminine self. Her writing subtly resists gender inequality, offering a veiled critique of female expression's societal and religious limitations. The essay highlights how Santa Teresa's mystical experiences grant her authority and intellectual freedom, allowing her to found "La orden de las carmelitas" and to contribute significantly to spiritual literature. Ultimately, her legacy transcends religion, marking her a key literary figure in women's history. Her work represents both a spiritual journey and a political act, reclaiming a female voice in a male-dominated religious tradition.

Title: Biological Effects of Trace Organophosphates on Larval Amphibians
Student(s): Santoshi Mutyala
Advisor(s): Dr. Sara McClelland

Organophosphorus pesticides were created with the intent to inhibit the nervous systems of insect pests, to decrease their numbers from impacting agriculture or spreading disease. Due to their widespread use, pesticides can be found in nature at varying concentrations including the habitats of many amphibians. Malathion is a common organophosphorus pesticide that causes seizures, nausea, and even death in non-target organisms exposed to acute concentrations. However, exposures to low and more environmentally realistic concentrations are less well studied. In this study, we wanted to better understand the impacts of environmentally realistic concentrations of organophosphates on amphibians after a chronic exposure. To do this, we exposed Northern Leopard Frog (*Lithobates [Rana] pipiens*) tadpoles to either a vehicle control, 1 µg/L of malathion, or 10 µg/L of malathion for approximately three weeks in a blind, controlled laboratory study. We found changes in behavior, brain morphology, and gut morphology in tadpoles exposed to the organophosphates. By gaining a better understanding of how environmental pollutants impact tadpole development, we may be more likely to improve how we apply pesticides and help conserve herpetofauna worldwide.

Student Oral Presentations III

Title: Socioeconomic Stream of Consciousness: Virginia Woolf and Her Relationship to Capitalism
Student(s): Fatimah Bouri
Advisor(s): Dr. Robert LaRue

As a modernist writer and feminist, Virginia Woolf established herself in different modes and literary styles, in flux with the times she lived in. Her oeuvre is a mosaic of feminist thought in *A Room of One's Own*, blooming bisexuality and gender expression in *Orlando*, and the confines of mental illness and grief in *The Waves*. These themes are laden with a socioeconomic crux that slithers quietly yet potently in these works - capitalism. When reading Woolf's works, I aimed to look at how capitalism often loomed in the feminist positions of *A Room of One's Own*, where she advocates for a woman to have money and a room of her own to be a fully realized writer; or in *Mrs. Dalloway* where she positions her upper-class hostess protagonist, Clarissa, as a well-off woman, privileged by capitalism yet weighed by home life conflicts. Woolf may not have explicitly named capitalism as a major culprit in her stream-of-consciousness novels and essays, but she alluded to its pitfalls and conjured instances where one needs to play along with capitalist endeavors as a means to an end for the aspiring writer.

Title: Using Ultraconserved Elements to Reconstruct the Evolutionary History of Akdalima (Opiliones: Samoidae)
Student(s): Hailey Hoffman
Advisor(s): Dr. Daniel Proud

Many species within the arachnid order Opiliones remain undescribed. This study uses morphological and molecular data to compare an undescribed species from Guatemala to a species already described from Mexico, and to understand their evolutionary relationships. Morphological data was collected through scanning electron microscopy, genitalia analysis, and observations of holotypes to generate a species description. A sequence capture protocol was used to target >1900 ultraconserved elements in the genome. Sequence data was then analyzed using bioinformatic tools to further investigate the relationships within the Opiliones family Samoidae.

Title: An Exploration of Video Game Narratives in Connection to Rhetorical Agency
Student(s): AJ Minnich
Advisor(s): Christopher Hassay and Elizabeth Gray

Video games have become one of the predominant forms of entertainment in modern American culture. Despite this, they are often viewed as childish or like kids' toys that people eventually should grow out of (Bogost 120). This project aims to challenge that view by using rhetorical theory to analyze video game narratives. By doing this, I have two goals: 1) to convey the complex communication and rhetoric that exists in narrative video games and, 2) to gain a better understanding of how video games convey messages to the audience and what makes those messages effective. With this in mind, I specifically am investigating this line of inquiry from the framework of different theories of rhetorical agency and narrative criticism. Games allow players to chart their own paths and shape their experiences with the medium through their own decision-making. Unlike linear forms of communication such as speech and writing, games communicate through systems and mechanics as well. Ian Bogost coined the term 'procedural rhetoric' to define the way games and other systems communicate to an audience. For this rhetoric to be possible, however, players must take on temporary constraints to their agency in order to engage with the rules of the game or system. By conducting narrative criticisms on three narrative-driven games (with hints of generic criticism), this thesis explores how games succeed or fail to negotiate agency with the audience.

Student Oral Presentations IV

Title: Hungry for Change: Moravian's Limited Dining Options for Restricted Diets
Student(s): Johnathan Dowling
Advisor(s): Elizabeth Gray

A research study into the nature of Moravian University students with dietary restrictions, such as gluten intolerance, and their struggle with finding safe and nutritious meals on campus. Because of the limited gluten-free options, risks of cross-contamination, and inconsistent food availability forcing students to seek alternate dining options, both costly and inconvenient, it's meant to bring attention to this issue. Though Moravian has introduced a couple of allergen labeling, as well as the "EveryDay" app to provide students with meal information, the measures aren't the most sufficient in ensuring dietary safety. Research featured in this writing shows that an inadequate series of dietary accommodations can lead to negative impacts on students' physical and mental health, creating stress and anxiety. Other universities have implemented allergy-friendly dining areas with a dedication for prep areas and utensils, which dramatically reduces the risk of allergens/cross-contamination. Moravian has the responsibility to implement similar measures, and can do so by improving food labeling, offering more allergen-free options, and ensuring consistent meal availability. By applying institutional awareness and action towards the issue, Moravian can create a more inclusive and supportive environment for those with dietary restrictions. It's not just a matter of convenience, but safety.

Title: Evaluating the Psychological Impact of Parental Substance Use on College Students
Student(s): Abigail Weiss
Advisor(s): Dr. Cathy Coyne

Background: Substance use disorders have lasting effects on the family unit. 30-40 million American adults have grown up in substance abusing familial systems. There is limited research on the college undergraduate population in relation to effects of parental substance use. It is imperative to understand these effects in order to grasp how parental substance use may have life-long effects on children. Study purpose: To determine whether a correlation exists between parental SUD and college student mental health. Methods: A cross-sectional study was conducted with 325 college students. A 48-item e-survey included the PHQ-2, GAD7, CD-RISC-10, and Ryff Psychological Well-Being Scale. The prevalence of parental substance use was calculated using participant reports. Using bivariate analyses, differences in scale scores between participants with and without parental substance use were examined. Results: Analyses indicate that 22% of college students have experienced parental substance use. Students with parental substance use scored significantly higher on the PHQ-2 and GAD-7, and significantly lower on the Ryff PWB Scale indicating higher levels of depression and anxiety, and lower levels of well-being when compared to students without parental substance use. Conclusion: It is anticipated that results can be utilized to better understand the effects of parental substance use.

Student Oral Presentations V

Title: Mutually-exclusive interaction of Connexin 43 with Src and ZO-1 is Regulated through a
Single Phosphorylation Event
Student(s): Hailey Belverio
Advisor(s): Dr. Anastasia Thevenin

Connexin 43 (Cx43) is a transmembrane protein that forms gap junctions (GJs) - cellular channel structures necessary for direct cell-cell communication. Cx43 GJ function is regulated through phosphorylation (a type of chemical modification) on the serine amino acids along Cx43 C-terminus (CT). Functional, open GJ channels interact with a scaffolding protein, zona occludens 1 (ZO-1). However, interaction of Cx43 GJs with a non-receptor tyrosine kinase Src closes GJ channels, thus decreasing cell-cell communication. Our laboratory recently screened mutants of Cx43 and observed that serine 373 phosphorylation on Cx43 recruits Src, while ZO-1 is unable to interact with Cx43 when this site is phosphorylated. We hypothesized that S373 phosphorylation serves as a regulatory switch and dictates whether Cx43 will interact with Src (when S373 is phosphorylated) or with ZO-1 (when that site is non-phosphorylated). Given the fact that overactive Src can cause cancer) and Cx43 is an important tumor suppressor, it is important to decipher molecular mechanisms that regulate Cx43/Src and Cx43/ZO-1 interaction in both healthy and cancerous cells. Our work provides important evidence that Cx43 phosphorylation dictates Src and ZO-1 recruitment to Cx43CT from healthy epithelial and cancer cells.

Title: RHPLG chemo agents
Student(s): Tyler Kokie
Advisor(s): Dr. Stephen Dunham

Development of biodegradable polymers is important for controlling and optimizing the delivery of drugs. This research focuses on the synthesis of dirhodium-poly-L-glutamic acid (PLG) conjugates as potential chemotherapy agents. To study dirhodium binding, PLG was first purified using high-performance liquid chromatography (HPLC) and isolated peaks characterized using mass spectrometry (MS) with either electrospray (LC-MS) or matrix-assisted laser desorption/ionization (MALDI-MS). HPLC analysis identified high-intensity peaks, particularly early strong fractions, as promising sites for dirhodium attachment. MS of these HPLC peaks should provide molecular weight data to indicate the length of the PLG polymer. The development of these polymer dirhodium-PLG complexes could lead to enhanced toxicity and more effective chemotherapy treatments.

Title: An Investigation into Body-Weight Supported Treadmill Running on Ground Reaction Forces Utilizing A Single Subject Design
Student(s): Sarah Rice
Advisor(s): Dr. Michael Steimling and Dr. Kathleen Madara

Body-weight support (BWS) treadmills offload part of the user's body weight, allowing them to exercise with less strain on the body. The Lever Movement System (LMS) is a type of BWS that utilizes elastic bands to suspend the user from an aluminum frame attached to the treadmill. This study investigates how offloading changes a runner's vertical ground reaction forces (VGRF). Four collegiate distance runners (3 M, 1 F) participated in a cross-over randomized control trial that compared two 30-minute treadmill runs at 100% and 80% body weight with the LMS. VGRF was collected with the Loadsol at 7 60-second intervals during each condition. VGRF data was compressed into 100-point time series curves for each footstep at each time interval. Statistical parametric mapping (SPM) was used to compare the time series force curves, allowing for statistical analysis within a single subject, alpha .05. VGRF was significantly reduced for most of the stance phase during the BWS conditions at all 7-time intervals for all participants. VGRF was most different between 40-60% of the stance phase. The 0-15% of the stance phase was the least different, with 2/4 participants demonstrating insignificance. All participants saw reduced VGRF when running on a treadmill equipped with the LMS. The greatest reduction was during the mid-stance portion of the running gait cycle when VGRF is greatest. The smallest reduction was during the load acceptance portion of the stance phase.

Student Poster Presentations I

Title: Generating biologically realistic neuron models using machine learning
Student(s): Zachery Bingaman & Deborah Rabinovich
Advisor(s): Dr. Jeffrey Bush

Accurate modeling of neuron behavior is essential for understanding the computational principles of the brain. Traditional approaches often rely on complex biophysical models that are computationally expensive and require expert knowledge to fine-tune. In this project, we explore the use of machine learning techniques to generate biologically realistic neuron models that replicate the dynamics of membrane voltage and ion channel activity. By training models on simulated and experimental electrophysiological data, we demonstrate the potential of machine learning to approximate key neuronal properties such as spiking behavior and voltage gating. This approach represents a promising intersection of computational neuroscience and machine learning.

Title: Analyzing the julius seizure Gene in *D. melanogaster*
Student(s): Jeanna DiAngelis
Advisor(s): Dr. Christopher Jones

Bang sensitivity in *Drosophila melanogaster* afflicted by the julius seizure (*jus*) mutation is a recently observed trait used to enhance our understanding of neural excitability. Previous research established CG14509 as the gene responsible for seizures in *Drosophila*, but no identifiable differences in the gene sequences between wild-type and mutant specimens were found. Thus, this study aimed to identify potential discrepancies outside of the coding region of the DNA, including the 5' untranslated region (UTR) and the end of the last exon as possible contributors. Wild-type (OR), *jus* mutant, and *Teb8* mutant *Drosophila* were used, with three sections of the gene analyzed across each fly variation. Polymerase chain reaction (PCR) and gel electrophoresis were used to identify variations in conjunction with the sequencing program 4Peaks. Of the three gene sections analyzed, two were found to have identical sequences across all three fly types (with one gene section yielding inconclusive results). This evidence aligns with previous research, but a discrepancy could occur in another area of the UTR, and/or involve post-translational processes. Future steps may include sequencing additional regions adjacent to those analyzed in this study or using quantitative PCR (qPCR) to measure protein expression levels across different fly types.

Title: Live Wire: What Connects "The Awakening," "Trifles," and "A Doll's House"
Student(s): Mayzi Edelhoiser
Advisor(s): Dr. Andrew Crooke

This comparative analysis of Kate Chopin's 1899 novel, "The Awakening," Susan Glaspell's 1916 play, "Trifles," and Henrik Ibsen's 1879 play, "A Doll's House" assesses how each text uses birds as a metaphorical device to elucidate the lived experiences of women. Composed of four sections, the analysis charts the protagonists' approaches to life, love, and motherhood, and asks the reader to consider the role of solidarity in each of their narratives.

Title: How We "Never Forget:" American Representations of 9/11
Student(s): Brooke Gormley
Advisor(s): Dr. Khristina Haddad

This project examines how the representation of 9/11 in American discourse has been shaped by a pro-American bias that distorts public understanding of the event and its aftermath. It explores how the American public sphere, already weakened before 9/11, failed to accommodate nuanced discussions about the event's causes and consequences. Using frameworks presented by Judith Butler, this study analyzes dehumanization and grievability in media narratives. It considers how museums and memorials contribute to a nationalistic memory of 9/11 that reinforces selective remembrance. Finally, this project explores the internet's role in shaping public perception through the spread of conspiracy theories and the memeification of 9/11, faulty representations that further complicate the narrative. Ultimately, this project argues that these distortions of 9/11 memory serve to uphold American exceptionalism, framing the U.S. as a uniquely innocent victim while obscuring the nation's role in global violence and the far-reaching consequences of its response.

Title: Assessing Protein-Protein Interactions between Src and Cx43 Mutants of the Novel Threonine 290 Phosphorylation Site
Student(s): Virginia Jacobsen, Abigail Angelisanti, Ryan Kulp, Sophia Shienvold
Advisor(s): Dr. Anastasia Thevenin

Connexin 43 (Cx43) is a membrane protein found in gap junctions and is responsible for regulating activities of potent cancer-driving proteins, such as Src. This interaction is regulated by Mitogen Activated Protein Kinases (MAPKs) on at least three serine sites (S255, S279, and S282). Previous researchers in our laboratory have demonstrated that phosphorylation at these sites by ERK, JNK, and p38 MAP Kinases decreases Cx43-Src interaction, shedding light on the regulatory mechanism of Src activity in healthy and cancer cells. In addition, our laboratory recently discovered a novel MAPK phosphorylation site: Threonine 290 (T290). However, the effects of T290 phosphorylation on the interaction between Cx43 and Src remain unstudied. Thus, we set out to express, purify, and test single mutants of Cx43 at T290: T290A (phosphorylation-dead), T290E (a phosphorylation mimetic), and T290N (a mutation of Cx43 observed in patients with a skin disorder, EKPV - Erythrokeratoderma variabilis and progressiva). All three mutants have been successfully expressed and purified from E.coli and are currently being tested in binding studies with purified, and active Src. These studies will help shed light on how Cx43 phosphorylation by MAPKs on both serine and threonine residues regulates Cx43-Src interaction and Src activity.

Title: Does Phosphorylation on Threonine 290 Regulate Cx43/Src Interaction?
Student(s): Ryan Kulp
Advisor(s): Dr. Anastasia Thevenin

Connexin 43 (Cx43) is a transmembrane protein that makes up cellular structures known as Gap Junctions (GJ's) that facilitate cell-cell communication. Recent research has identified the Cx43 C-terminus as a signaling hub that provides a docking station for a protein Src, a non receptor tyrosine kinase implicated as a driver in various cancers. The recruitment of Src to the C-terminus of Cx43 allows Src inhibition through its two inhibitors, Csk and PTEN. The Src binding region of the Cx43 C-terminus contains a series of amino acid residues that are known to be chemically modified through phosphorylation (S255, S279, and S282). We hypothesized that phosphorylation at these sites provides a mechanism for regulating the Cx43 and Src interaction. Previous students used phosphomimetic and phospho-dead Cx43 mutants at these sites and studied their interaction with Src. S255, S279, and S282, when phosphorylated, lead to a decrease in Src binding. However, our lab identified a new phosphorylation site nearby - threonine 290 (T290). This work seeks to build upon previous studies with serine mutants to assess the effect of threonine 290 (T290) phosphorylation on regulating Cx43-Src interaction.

Title: Synthesis and Characterization of Dirhodium Valproate Complexes for Enhanced Anticancer Effectiveness
Student(s): Truong Le
Advisor(s): Dr. Stephen Dunham

Cancer drugs typically target a single biochemical pathway to disrupt cell function and induce cell death (apoptosis). A drug that integrates two distinct toxicity mechanisms, such as interfering with DNA replication, while also disrupting protein synthesis, could enhance therapeutic effectiveness by attacking cancer cells through multiple mechanisms. Dirhodium complexes are known for their anticancer properties, while valproate, an anticonvulsant, inhibits histone deacetylase (HDAC). Combining these drug properties could increase the expression of tumor suppressor genes while silencing cancer cell proliferation genes, making their combination a promising cancer treatment. Both cis and trans dirhodium valproate complexes were synthesized and analyzed. The synthesis involved purification using high-performance liquid chromatography (HPLC), followed by structural analysis using mass spectrometry (HPLC-MS) and nuclear magnetic resonance (NMR) spectroscopy. The cis dirhodium valproate compound was successfully characterized, and attempts to synthesize the trans isomer are in progress. Potential factors contributing to the challenges of the trans synthesis were identified, thus allowing for improvements in future synthesis. With the successful characterization of the cis compound, further studies can now assess whether combining these two mechanisms of toxicity enhances the drug's effectiveness in treating cancer cells.

Title: The Detection of Chlorpyrifos in Golf Courses
Student(s): Alexandra McDevitt
Advisor(s): Dr. Alison Holliday and Dr. Colleen Payton

The purpose of this project was to detect the presence and quantify the concentration of the pesticide chlorpyrifos in soil from a golf course. Using samples collected on the first nine holes of the fairways and roughs, QuEChERS extraction and analysis using gas chromatography - mass spectrometry (GC-MS) was performed. It was determined that the golf course used a detectable amount of chlorpyrifos, with concentrations ranging per hole. No significant difference was found between the fairways and roughs.

Title: Analyzing Anti-Predator Responses of Tadpoles after Chronic Exposure to Nanoplastics
Student(s): Emma Pollackov
Advisor(s): Sara J. McClelland

Production of single-use plastic goods has increased globally since the mid-1950's. Today, over 360 million metric tons of plastic are created annually that break down into smaller particles of debris. Particles are classified based on size. Plastics < 1µm in diameter (termed nanoplastics) were used in this experiment. In nature, tadpoles aggregate as a defense from predators. This study tested whether exposure to environmentally realistic concentrations of nanoplastics impacted how tadpoles react to predators. We raised tadpoles in two groups: one group was exposed to a low concentration of nanoplastics in the water (1 ug/L of 740-4990 nm) and the other was a water control. Tadpoles were then habituated to an experimental tank and clustering was measured. A predator (crayfish) was added to the tank, and clustering was re-measured. Tadpoles that were exposed to nanoplastics clustered less in the presence of predators than tadpoles that had no nanoplastic exposure, making them more likely to succumb to predation. More research is needed to determine why nanoplastics interfered with anti-predator defence mechanisms. This work has implications on development and health of all animals, including humans, as many studies have found plastics throughout the body.

Title: Microhabitat factors influencing shrub encroachment into coastal grasslands
Student(s): Giselle Ponce-Bautista
Advisor(s): Natasha Woods

Shrub encroachment into grasslands is a worldwide phenomenon. Encroaching shrubs can shift ecosystems from being dominated by grasses, with ecosystem-level consequences such as available wildlife habitat, plant species richness, ecosystem structure, and carbon dynamics. This transition of plant dominance from grass to shrub has occurred rapidly on the U.S. mid-Atlantic and Gulf coasts. On Hog Island, Virginia, a Long-Term Ecological Research site, warmer winter temperatures contribute to the expansion of native shrub, *Morella cerifera* into grasslands. However, there are areas within the grassland where shrubs do not establish. The purpose of this study was to compare differences in microhabitats that

may contribute to shrub presence in newly encroached grassland and un-encroached grassland. Understanding these differences can allow researchers to anticipate which conditions favor shrub encroachment and allow scientists to model future expansion. The study established plots in grass-dominant areas (grassland plots) and shrub-dominant areas (transition plots) (n = 5). Within these plots differences in woody plant cover, soil relative water content, and soil chlorides were examined during the summer. No differences occurred in total vegetation cover between the two sites. In the grassland plots, woody species make up 1% of the plant cover, whereas in the transition plots, woody species make up 41%. Soil relative water content (12%) and soil chlorides did not differ between grassland and transition plots. Although there are stark differences between woody plant cover in the grassland and transition plots, summer soil water content and chlorides do not appear to explain plant structure. Ongoing research will examine seasonal changes in soil salinity and water availability to help identify limitations to shrub establishment.

Title: **Personality and Mobbing Behavior in Shrimp During Predator Interactions**
Student(s): Brianna Swinkowski
Advisor(s): Dr. Joshua Lord

Grass shrimp (*Palaemon pugio*) are ecologically significant organisms that inhabit Atlantic Coast marshes, whose behavioral interactions, particularly with predators, remain understudied. This research focuses on investigating whether grass shrimp exhibit consistent individual differences in mobbing behavior, which is a form of predator harassment, when faced with fish predators. In this experiment, we created an enclosure with three sections, all accessible to the shrimp but only one area that the fish could not enter. Typically, the shrimp would move into the predatory area and engage in mobbing behavior, attacking the fish. This setup allowed for the observation and quantification of shrimp behavior in predator interactions. These findings will provide insight into whether shrimp exhibit consistent behavioral traits overtime, suggesting “personality.” These results could enhance our understanding of how invertebrates avoid predators and how their personalities affect how they interact with predators and prey.

Title: **The Determination of Lead In Tattoo Ink**
Student(s): Adelaide Treibley
Advisor(s): Dr. Alison Holliday

There are no regulations on the composition of tattoo ink in America. Europe has recently been putting regulations on ink composition, especially metal concretions within ink. Lead is a possible ingredient in tattoo ink and with no current regulations, the amount of lead in tattoo ink is unknown and could vary from brand to brand. Acid digestion was used to break down all organic components of the ink while leaving metals behind. Graphite furnace atomic absorption spectroscopy(GFAAS) was used to measure lead levels within the ink. Multiple samples were prepared from the same ink bottle using multiple preparation methods to compare what preparation gave the best results. The samples contained a range of lead concentrations, the lowest being 7 parts per billion and the highest being 52 parts per billion. The range suggests that sample preparation is important to analysis as the lead is not even suspended within the ink inside the bottle.

Title: **Analysis of Δ8- and Δ10-THC in Commercial Products using Liquid Chromatography-Mass Spectrometry**
Student(s): Rebecca Uwase
Advisor(s): Dr. Alison Holliday

There are no regulations on the composition of tattoo ink in America. Europe has recently been putting regulations on ink composition, especially metal concretions within ink. Lead is a possible ingredient in tattoo ink and with no current regulations, the amount of lead in tattoo ink is unknown and could vary from brand to brand. Acid digestion was used to break down all organic components of the ink while leaving metals behind. Graphite furnace atomic absorption spectroscopy(GFAAS) was used to measure lead levels within the ink. Multiple samples were prepared from the same ink bottle using multiple preparation methods to compare what preparation gave the best results. The samples contained a range of lead concentrations, the lowest being 7 parts per billion and the highest being 52 parts per billion. The range suggests that sample preparation is important to analysis as the lead is not even suspended within the ink inside the bottle.

Student Poster Presentations II

Title: Protein-Protein Interaction Studies Between Purified Cx43CT & Fluorescently-tagged ZO-1
Student(s): Mariam Abdalla
Advisor(s): Dr. Anastasia Thevenin

Connexin 43 (Cx43) is a membrane protein that forms gap junctions (GJ) and plays a role in cell-cell communication. It interacts with Zona Occludens-1 (ZO-1), a scaffolding protein that helps organize and stabilize GJs. In contrast, Src, a non-receptor tyrosine kinase, binds to Cx43 and leads to GJ closure, reducing intercellular communication. Preliminary results in our laboratory demonstrate that mimicking phosphorylation at S373 promotes Src binding and inhibits ZO-1 interaction, while the non-phosphorylatable form of Cx43 favors ZO-1 binding. In our attempts to conduct such studies in multiple mammalian cell lines, we struggled with the immunodetection of ZO-1 proteins using multiple commercial ZO-1 antibodies. Therefore, it was decided to use a fluorescently-tagged construct of ZO-1 (GFP-ZO-1) and GFP antibodies. Madin-Darby Canine Kidney (MDCK) cells were transfected with GFP-ZO-1 cDNA and lysed. The interactions between GFP-ZO-1 in lysates and purified GST-Cx43CT S373 mutants (S373E and S373A) bound to GSH beads were studied using western blotting with GFP-specific antibodies. Given that Cx43 is a tumor suppressor and Src is an oncogenic protein, understanding how phosphorylation regulates their interaction is critical. This work will provide new insight into gap junction dynamics, cell signaling, and disease processes such as cancer.

Title: Direct Phosphorylation by Mitogen-Activated Protein Kinases Prevents Cx43-Src Interaction
Student(s): Abigail Angelisanti
Advisor(s): Dr. Anastasia Thevenin

Connexin 43 (Cx43) is a membrane protein scaffold responsible for regulating the activities of potent cancer-driving proteins, such as Src. Src is commonly overactive in cancer cells, leading to aberrant cell proliferation. Recent experiments in our lab have demonstrated that Cx43 interaction with Src decreases when Cx43 phosphorylation was mimicked at amino acids S255, S279, and S282. These sites are differentially phosphorylated by the members of the MAPK family (ERK, JNK, and p38): ERK has a preference for all three amino acids, JNK has a preference for S255 and S279, while p38 prefers S279 and S282. In this project, the effect of the direct phosphorylation by each pure and active MAPK on Cx43-Src interaction was analyzed in vitro through binding experiments. Cx43 was treated with different concentrations of MAPKs to phosphorylate S255, S279, and S282. MAPKs were then removed prior to the addition of purified Src. Levels of Cx43-bound Src were detected with Src-specific antibodies. Cx43 phosphorylation at these sites was monitored with phospho-Cx43 antibodies. Our results demonstrate that Cx43 phosphorylation by each MAPK differentially decreases Cx43-Src interaction, providing important molecular detail for our ongoing development of Cx43-based peptides that target Src activity in cancer cells.

Title: The Impact of Caring for Patients with Left Ventricular Assist Devices (LVADs) on Nurses' Psychological Health
Student(s): Kayla Biege
Advisor(s): Dr. John C. Mikovits

Nurses are at risk of developing psychological distress due to the nature and workload of environments and may not seek help for this distress due to stigma about mental health. Nurses caring for Left Ventricular Assist Device (LVAD) patients are at a higher risk of developing mental distress related to stressful care requirements, stronger nurse-patient relationships, and ethical dilemmas that arise during care. The main purpose of the study was to explore the impact of caring for patients with LVADs on nurses' psychological health and examine coping strategies used for stress management. Qualitative design was utilized to conduct interviews with nurses to collect data regarding the subject at hand. Findings suggest that nurses caring for LVAD patients do experience mental health disparities. Five themes were developed and listed as follows: Caring for the LVAD Instead of the Patient; Right Implant, Wrong Patient; Complex and Connected Care; Mental Exhaustion and Life Balance; Effective Coping and Semi-effective Resources. The results of the study provide implications for future nursing practice and education surrounding the use of LVADs while highlighting the importance of emotional and mental health support in the workplace environment to decrease the burden experienced by nurses caring for LVAD patients.

Title: **Impact of *Morella cerifera* root exclusion on *Sporobolus pumilus* growth in coastal grasslands**
Student(s): Laurie-Anna Bienaime
Advisor(s): Natasha Woods

Grasslands cover approximately 40% of the Earth's total land area. Woody plant encroachment (WPE) in rangeland, savannas, and in coastal areas threatens grass cover dominance. WPE has been documented over the last forty years on Hog Island, Virginia. As shrubs become more dominant in grasslands, grasses are replaced. The relationship between grasses and shrubs can be quite complex. Grasses have been shown to facilitate shrubs above ground, protecting them from harsh abiotic conditions. The impact of shrubs on grasses is less clear. The current experiment isolated the roots of an expanding shrub, *Morella cerifera*, from the dominant grass, *Sporobolus pumilus*. Plants were allowed to grow for three months in conditions that simulated their microhabitat on Hog Island. The results show that for *S. pumilus*, the average biomass for the control was 0.82 ± 0.08 g and the root exclusion group was 0.81 ± 0.07 g. The stem count was 117.47 ± 84 , and the root exclusion group was 118.13 ± 6.38 . Belowground biomass and stem count were not significantly different. Aboveground *Sporobolus* biomass was 20.73 ± 0.87 for the control and 15 ± 0.8 for the root exclusion group ($P < 0.05$). These results show that *Sporobolus* grows better when not associated with *Morella*. Even though their stem counts were not significantly different, the stems that grew when the roots were isolated contained a greater biomass. This suggests that *Morella* has a negative impact on the growth of *Sporobolus*.

Title: **Mobbing Behavior in Grass Shrimp**
Student(s): Matthew Braun
Advisor(s): Dr. Josh Lord

Grass shrimp (*Palaemon pugio*) exhibit an unusual anti-predator behavior known as mobbing, where they antagonize the predator rather than flee from it. This study investigates whether mobbing behavior is a fixed trait or influenced by social and environmental context. Controlled trials were conducted in which shrimp with varying mobbing tendencies were tagged and placed into different social environments, and their interactions with predators were recorded and analyzed using video tracking. Results suggest that mobbing behavior is relatively stable, as shrimp that initially exhibited high or low mobbing tendencies maintained similar behaviors when grouped with similar individuals. However, some variability was observed, suggesting that certain shrimp may adjust their behavior depending on social context.

Title: **Weaving Dual Identities: Artistic Exploration in Filipino-American Heritage and Bi-Racial Narratives**
Student(s): Zuri Foell
Advisor(s): Natessa Amin

This SOAR research project is a hands-on exploration of artistic practices in which I have focused on ways of weaving together personal narrative and historical research surrounding my bi-racial identity as a Filipino-American. Prominent art making in Filipino culture includes sculpture, painting and pottery, an indigenous tattooing practice known as Batok, and ancient script called Baybayin. By understanding these practices of traditional art forms, as well as acknowledging the common lived experiences of those with dual identities, I have used these deeper connections to create art that represents longing, change, and appreciation through abstract expression.

Title: **Rediscovering the Hollywood Saxophone Quartet**
Student(s): Jacob (Coby) Gumulak and Nicholas (Nick) Mancini
Advisor(s): Dr. Neil Wetzel

The Hollywood Saxophone Quartet was a group of Los Angeles-based studio musicians active from the 1950s to the 1970s. They collaborated with renowned composers like Billy May, Lennie Niehaus, and Russ Garcia, who worked with musicians such as Frank Sinatra and Buddy Rich. However, much of their sheet music has been lost, with only a few handwritten, photocopied pieces remaining. Inspired by their music, the saxophone quartet at Moravian proposed a SOAR project in the summer of 2024, dedicating 10 weeks to researching the group's history, professional lives of the members, and the music. Research focused on the debut album, *The Hollywood Saxophone Quartet*, analyzing recordings and transcribing available sheet music into digital notation for future use. To preserve their legacy, we created archival recordings of these works in Moravian's recording studio, hosted a concert at Foy Hall, and presented our findings at the Jazz Education Network (JEN) Conference in January 2025 in Atlanta, GA. Through this project, we revived a nearly forgotten part of jazz history, ensuring that the Hollywood Saxophone Quartet's music remains accessible for future musicians and researchers.

Title: Proud's Lab 2024 Field Exhibition: Harvestmen (Opiliones) Collection in Costa Rica
Student(s): Maria Lubbos
Advisor(s): Dr. Daniel Proud

This poster will present Proud's Lab's 2024 field exhibition in Costa Rica, where we spent 17 days collecting harvestmen (Opiliones) across various stunning locations. It will highlight the unique collecting techniques our team used during the fieldwork and provide insight into the experience of conducting field work as an undergraduate student. We'll also feature fascinating images of the national parks we visited, emphasizing the significance of these protected areas. The poster will discuss the role of national parks in preserving biodiversity, as well as details about the valuable specimens we collected during our trip. Furthermore, the poster will offer a glimpse into some memorable and unexpected moments from our fieldwork, showcasing the challenges and rewards of scientific research in the field.

Title: Grass Shrimp Unite Against a Common Enemy
Student(s): Glorianny Mosquea
Advisor(s): Dr. Josh Lord

Mobbing behavior is a defense mechanism that has been analyzed in many vertebrate species like birds and fish. In simple terms it involves a species approaching their predator and attacking or harassing them in order to drive them away or reduce the risk of predation. This project investigated whether or not grass shrimp (*Palaemon pugio*) display consistent differences ("personality") in mobbing behavior. Grass shrimp or ghost shrimp are a small (~2.5cm), translucent marine species that is abundant and ecologically important along the coast of the Atlantic and the northern Gulf of Mexico. Despite this, grass shrimp are understudied, with little known about their antipredator behavior. In this experiment, ten tagged grass shrimp were placed into a divided enclosure and could move freely between a predator-free shelter and an open area with a blue crab (*Callinectes sapidus*) predator. Shrimp were recorded for a period of 15 minutes on three consecutive days in order to assess the consistency of their behavior; were the same shrimp mobbing the predator each day? We found that the shrimp would repeatedly leave their shelter and attack/harass their predator, but this behavior was not equally exhibited by all shrimp. On average, the top 5 mobbers in each trial accounted for 88% of the mobbing behavior. When shrimp were ranked according to mobbing frequency, there was an average of 73% rank stability between one day and the next, indicating that there is consistent variation in mobbing behavior between individuals.

Title: Fluorescence studies of the disruption of G-quadruplexes by 6-thioguanine
Student(s): Edward Nuber
Advisor(s): Dr. Stephen Dunham

A goal of this research is to further understand how 6-thioguanine works as a cancer drug. 6-Thioguanine is a modified component of deoxyribonucleic acid (DNA) that is commonly found at the ends of chromosomes (telomeres). Telomeres are stabilized when four guanine (G) bases form G-quadruplexes. We are using fluorescence to study a G-quadruplex that is related to telomeres and replacing G with 6-thioguanine to see how that substitution might change the shape and stability of the DNA. We are determining the best fluorescent dye molecule to use for studying the control G-quadruplex and varying ions (potassium, sodium, lithium) to change the shape of the DNA. Once we have reliable fluorescence data for the control G-quadruplex with different ions, we will investigate if adding 6-thioguanine changes the shape of the control G-quadruplex DNA.

Title: Timing of post-storm rainfall and its influence on *Morella cerifera* expansion on coastal barrier islands
Student(s): Emily Nyce
Advisor(s): Natasha Woods

Along the U.S. Atlantic Coast, barrier islands are breaking apart, partly because a native shrub, *Morella cerifera*, is spreading into grasslands. The expansion of this shrub is linked to warmer temperatures, as it is cold-intolerant. Hurricanes raise salt levels in the soil, which can stress vegetation. However, heavy rainfall usually follows these storms, diluting the salt. The goal of this study is to investigate how rainfall at two different intervals after a simulated storm events impacts the salinity and survival of *Morella cerifera* seedlings. The experiment took place under grow lights, which simulate natural sunlight. Treatments consisted of control (no salinity), Treatment 1 (flushing with fresh water one day after salinity), and Treatment 2 (flushing with fresh water two days after salinity). Growth was observed from February

2025 to March 2025, including height, canopy area, and biomass. Salinity and flushing did not significantly affect seedling height, with an average growth of 4.66 cm. However, canopy area differed significantly: the control group had the largest canopy ($502.1 \pm 139 \text{ cm}^2$), while Treatment 1 ($154.3 \pm 28.8 \text{ cm}^2$) and Treatment 2 ($159.6 \pm 108.1 \text{ cm}^2$) were much smaller. Biomass was lowest in Treatment 1 (0.50 g), compared to the control and Treatment 2 (both 0.62 g). These results suggest that flushing one day after salinity exposure had the most negative impact on *M. cerifera* growth and overall health over the six-week period. With projected increases in storms salinity exposure will be an important control on shrub encroachment.

Title: **Insights from Indian Immigrants on Patient-Centered Rehabilitation: An International Collaboration**

Student(s): Emily Tucker and Mary Jane Granito

Advisor(s): Monica Kaniamattam

International inter-university projects enable students from each country to serve as cultural informants, helping their counterparts gain insights into the socio-culturally informed perspectives on disability and rehabilitation prevalent in their local context. Such collaboration enhances understanding of how these perspectives influence family roles and expectations regarding rehabilitation services, including speech-language therapy. It also provides an excellent opportunity for Speech-Language Pathology (SLP) students to develop cultural sensitivity about the local culture and contributes to their journey of developing cross-cultural competence. The current project involves collaboration between students from an SLP program in Pennsylvania and India to produce an awareness video on rehabilitation access and support needs of Asian Indian immigrants. This project team included two third-year undergraduate SLP students—one from India and one from the U.S.—along with a first-year Master's SLP student as the mentor. The team studied the experiences of Asian Indian immigrants with rehabilitation needs, shaped by cultural complexities and the challenges of adapting to new systems, and interviewed various stakeholders from this community. The project team conducted a collaborative autoethnography focusing on developing cross-cultural sensitivity. Throughout the project, the students maintained detailed reflection notes. Their independent reflections, WhatsApp group chat messages, and group discussions served as the primary data set for the collaborative autoethnography. Analysis of independent reflections and group discussions reveals that this inter-university project provided a valuable learning opportunity. The presentation will advocate for culturally sensitive rehabilitation service provision and the need for cultural competence and humility in rehabilitation professionals and students.

Title: **Impact of Acute Fluoxetine (Prozac) Exposure on Hierarchy Formation in Shrimp**

Student(s): Jorge Velazquez

Advisor(s): Dr. Josh Lord

Quantifiable amounts of the selective serotonin reuptake inhibitor Prozac have been found in the effluents of wastewater treatment plants. These drugs find their way into local ecosystems, potentially impacting unintended targets. *Palaemon pugio*, an estuarine grass shrimp, functions as an ecologically critical species, facilitating energy transfer between higher and lower trophic levels. Recent research indicates that female grass shrimp establish linear dominance hierarchies. Serotonin operates as a critical neurotransmitter in the regulation of aggression and anxiety and, as such, plays a role in mediating dominance hierarchies. Grass shrimp were acutely exposed to Prozac under four conditions (25 mg/L 15 min, 50 mg/L 15 min, 50 mg/L 60 min, control). Conspecific interactions were tracked, analyzed, and compared across groups. While the strength of the hierarchy remained the same despite Prozac exposure, the frequency of dominant interactions decreased. These findings provide a preliminary understanding of how these pharmaceutical pollutants affect *Palaemon pugio*.

Title: **Salinity and Burial Impact Juvenile and Seedling Stages of *Morella cerifera***

Student(s): Brianna Whalen

Advisor(s): Natasha Woods

Barrier islands act as essential shields to mainland cities and ecosystems during major storm events. *Morella cerifera* (hereafter *Morella*), is a native shrub occurring on barrier islands of the US mid-Atlantic and Gulf coasts. Warmer winter temperatures have caused *Morella* to encroach into neighboring grasslands, resulting in expansive thickets across islands. Dunes can shield *Morella* from overwash and other disturbance events that deposit sediment and introduce salt spray. However, if dunes are destroyed by storms before they can be rebuilt, *Morella* may experience increased burial from storms and increased salinity from salt spray. The impact of the frequency of burial and salinity on *Morella* is currently

unknown; however, seedling age may impact the tolerance to these stressors. The experiment investigates the extent to which the growth of *Morella* at two life stages (seedling–7 week old–and juvenile–1 year old) are differentially impacted by salinity, burial, and the combination of burial and salinity. The combination treatment simulates natural overwash events in the field. In order to simulate the natural microenvironment, each pot contained a single *Morella* surrounded by three *Sporobolus pumilus* grasses (hereafter *Sporobolus*), and they were buried in sand obtained from Hog Island, Virginia. *Morella* height was not impacted within age groups by simulated storm conditions, however *Morella* canopy area was limited by salinity exposure across both age groups. *Sporobolus pumilus* grown with juvenile *Morella* exposed to burial had significantly lower biomass, and *Sporobolus* stem density was limited by burial across both *Morella* age groups.

Student Poster Presentations III

Title: **Synthesis of Diphenylamino Ketones as Precursors for Radical Arylation**
Student(s): Jenna Azar
Advisor(s): Dr. Godfred Fianu

In this study, the synthesis of 1-(diphenylamino)-2-propanone as a model compound for radical arylation studies was carried out. The synthetic pathway involved a multi-step approach, where diphenylamine was reacted with 3-chloro-2-methyl-1-propene in a substitution reaction. Subsequent oxidation was carried out using osmium tetroxide and sodium periodate, providing an efficient route to the desired ketone. The crude product was then purified via column chromatography and characterized using NMR, and GC-MS. This method proved advantageous over alternative synthetic routes because it produced the highest yield of desired product. The synthesized diphenylamino ketone will be used to carry out radical arylation studies to form indoline derivatives, which are basic motifs found in antitumor agents. Although the syntheses of indoline derivatives via the radical arylation of diphenylamino epoxides have been extensively studied, a study on the radical arylation of diphenylamino ketones to form indoline derivatives could also serve as an alternative and synthetically useful pathway. The same synthetic approach was applied to produce 1-(phenyl(p-tolyl)amino)propan-2-one, which will potentially be used to further investigate the regioselectivity of radical additions to arenes.

Title: **Investigating the Effects of Spatial and Temporal Visual Feedback Distortions on Reach-to-Grasp Movements Using Leap Motion Tracking**
Student(s): Deb Bhattacharyya
Advisor(s): Dr. Luis Schettino, Lafayette College

Precise hand-eye coordination is essential for daily motor tasks, yet disruptions in visual feedback can alter movement planning and execution. This study examines how spatial displacement and temporal lag in visual feedback affect reach-to-grasp movements. Using the Leap Motion Controller 2, participants will interact with a computer screen while their hand movements are tracked in real-time. A virtual tabletop environment, aligned with the real-world workspace, will present graspable objects under three conditions: (1) baseline (real-time feedback), (2) spatial displacement (hand position offset), and (3) temporal lag (delayed visual response). Movement trajectories, reaction times, and grasp accuracy will be analyzed to assess motor adaptation. Findings are expected to provide insights into sensorimotor recalibration and compensatory strategies, with potential applications in rehabilitation for movement disorders such as Parkinson's disease. This research bridges neuroscience and human-computer interaction, leveraging motion tracking technology to explore how the brain integrates altered sensory feedback for motor control.

Title: **Movie Soundtracks and Effects on Viewers**
Student(s): Deb Bhattacharyya and Evan Stoudt
Advisor(s): Dr. Sarah Johnson

Film music and its various potential impacts on viewers has long been studied in the field of psychology. In this study, the effects of different genres of music on viewers' emotional perception, memory of the movie clip, and the perceived movie genre were analyzed. 39 participants, in a randomly selected between subjects design, viewed the same ambiguous, short clip from "Vertigo". Different musical conditions accompanied the clip for each group, including romantic music, thriller music(original soundtrack), or no music. Following the viewing of the clip, a brief distraction activity was completed and

an online survey was then completed - collecting demographic and film related information. The different music conditions provided a significant difference in the perceived film genre, but did not show a difference in the emotional perception or the memory of the scene. Thus, the genre of music accompanying a film can influence the viewers' interpretation of the film and indicate that sensory inputs are integrated in emotional responses.

Title: Partition Coefficients of Dirhodium compounds using HPLC

Student(s): Evan Bulette

Advisor(s): Dr. Stephen Dunham and Dr. Shari Dunham

Dirhodium compounds are currently being investigated as potential new chemotherapeutic drugs. Properties such as membrane permeability and cytotoxicity for these dirhodium compounds are essential to know. The goal of this experiment was to determine the partition coefficient (Log P) for numerous dirhodium compounds. Log P values are very important when it comes to membrane permeability. The higher the Log P value the easier it is for that compound to enter the cell. Log P was determined using high-performance-liquid-chromatography (HPLC) and different solvents with varying concentrations of methanol. First, organic compounds with known Log P values were run using a 40% methanol 60% water solvent. Their elution times were used to make a standard curve. Then multiple dirhodium compounds were run on the HPLC and their elution times were recorded. Using the standard curve, estimated log P values were calculated for these dirhodium compounds. Currently, standard organic compounds are being tested with a 5% methanol 95% water solvent with the goal of determining Log P for some more polar dirhodium compounds. These results are important, because they show how well the dirhodium compound can enter cancerous cells and may be correlated to the toxicity of these compounds in cancer cells.

Title: Species Composition Research on Hog Island

Student(s): Mia Espinal and Bria Bartholomew

Advisor(s): Natasha Woods

Barrier islands located on the coast of Virginia function as a main source of protection for the mainland from strong storms. These islands can serve as a buffer for storms because their structure is flexible and can “rollover” or move. Recently Shrubs have been encroaching into areas dominated by grasses, adding stability where rollover needs to occur. Interestingly, shrubs are not encroaching everywhere in grasslands on Hog Island, VA. The current research examines differences between the growth of common plants where grasses are dominant (i.e., grassland zone) and where shrubs are dominant (i.e., transition zone). Root length, surface area, and biomass were all used as proxies for growth of the common species. The results show that there were no significant differences between root length and surface area; however, root biomass was marginally significant between the two areas ($p=0.52$). Plants growing in the transition zone do not seem to have an advantage over plants growing in the grassland zone, thus it is unclear why shrubs are encroaching in this area. Future studies will examine the extent to which the growth of these plants change over time.

Title: Showdowns in the Salt Marsh: Investigating Mobbing Behavior in Aggressive Grass Shrimp

Student(s): Makayla Excell

Advisor(s): Dr. Joshua Lord

In the wild, some creatures flee from danger, while others do the unthinkable; confront their predators head on! Grass shrimp (*Palaemon pugio*) may be small (~2.5cm), but they don't always back down when faced with a threat. Instead of avoiding predators, they often harass them, a behavior that is known as mobbing and that is mostly described in vertebrates like birds and fish. This study aimed to determine whether the most aggressive shrimp were the ones leading these high-risk confrontations against the blue crab (*Callinectes sapidus*). If dominance or social status plays a role, then the most aggressive shrimp might be the first to engage with a predator. If aggressiveness or likelihood to mob is a static trait, then we would expect that groups of high-frequency mobbers would be more aggressive towards predators. We conducted three-day experiments to determine which shrimp mob most frequently and then shifted shrimp between tanks to create a population with only the most aggressive individuals. We found that mobbing in these “aggressive” groups was more frequent than expected but that there was a high degree of flexibility in the frequency of mobbing for individual shrimp. Because most mobbing occurs in vertebrates and on large geographic scales, this shrimp system provides a unique experimental opportunity, in addition to providing more insights into predator-prey relationships in salt marsh habitats.

Title: A Rapid Screening Method for Biomolecule Binding of Rhodium Complexes
Student(s): Elina Georges
Advisor(s): Dr. Shari Dunham

The project goal is development of a rapid screen to see if new rhodium-containing complexes have significant interactions with either double-stranded DNA or a major protein in mammalian blood. A widely used anticancer drug, cisplatin, is used to treat various cancers, including bladder, ovarian, testicular, head and neck, lung, and cervical cancers, as well as some lymphomas and sarcomas. Work in our laboratories synthesizes and studies other metal complexes containing rhodium for potential anticancer activity. The screening starts with reaction samples of known DNA or protein concentration to which rhodium complexes are added. Portions of these reactions are briefly filtered such that the biomolecules do not pass through the membrane and only a limited volume (<10%) does pass through. The concentration of metal in the solution that passes through the membrane is measured using atomic spectroscopy and changes in its concentration indicate strong association or binding with the biomolecules. Changes in metal concentration in the filtrate over reaction time will be presented and discussed for their indication of anticancer drug potential.

Title: Habitat-Specific Mobbing Behavior of Grass Shrimp in Response to Blue Crabs
Student(s): Margie Rayne
Advisor(s): Dr. Josh Lord

Grass shrimp (*Palaemon pugio*) have little known about their intraspecific interactions or antipredator behavior, despite being abundant and ecologically important organisms along the east coast of North America. The purpose of this research was to simulate a natural salt marsh environment in order to determine the impact that habitat has on the antipredator behavior known as “mobbing”. Previous work in our lab has shown that these shrimp exhibit mobbing behavior towards crab and fish predators, even leaving cages and sheltered environments to approach the predator. In this experiment we created a small-scale simulated salt marsh habitat with varying densities of artificial plants, testing to see how shrimp and predatory blue crabs (*Callinectes sapidus*) utilized habitat. We found that shrimp occupied several different types of these artificial habitats and exhibited mobbing behavior regardless of the habitat in which the blue crab occupied. The results from this study suggest that grass shrimp mobbing behavior is likely to persist in different habitats but that predator habitat choice adds a complicating factor.

Title: Exploring Relationships Between ‘Personality’ and Dominance Hierarchies in Shrimp (*Palaemon pugio*)
Student(s): Prince Sokpo
Advisor(s): Dr. Josh Lord

Shrimp are interesting creatures that have more to them than meets the eye; shrimp tend to display a dominance hierarchy in their groups, which impacts on shrimp habitat use and predator-prey relationships. This project is based on the grass shrimp *Palaemon pugio*, which resides along the east coast in North America. In this study, 10 grass shrimp were placed into an enclosure with one another and predators such as mummichog fish and blue crabs were introduced in 15-minute intervals. The enclosures have a separation barrier that allows shrimp to hide as well as go out to attack the predators. We assessed intraspecific shrimp aggression and hierarchy formation both before and after predator exposure to see whether it was disrupted by these interactions with predators. We also examined the level of aggression and stability over a 3-day period. We found that there was a strong correlation between shrimp hierarchy position before and after the predator interactions, indicating that predators do not substantially disrupt hierarchies. The amount of fights decreased over the 3-day experimental period, as expected with hierarchy formation. These results help expand our understanding of the factors that can influence shrimp aggression and social structure.

Title: Synthesis of dirhodium carboxylate compounds
Student(s): Andrew Unangst
Advisor(s): Dr. Steve Dunham

In 2024, an estimated 2 million new cancer cases will be diagnosed in the USA. Making and testing new cancer drugs is part of ongoing research at Moravian University. One type of drug being optimized is dirhodium tetra carboxylates. In this research project, carboxylic acids were added to dirhodium tetrabutylate compounds to synthesize new products

potentially capable of being fatal to cancer cells. Dirrhodium tetrabutylate was first monosubstituted with trifluoroacetic acid (TFA). The TFA was then replaced with either valproate or octanoate. Reactions were monitored and major products were isolated using high-performance liquid chromatography (HPLC). Nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry (MS) were used to analyze major HPLC product peaks. The ability to efficiently synthesize and purify these new carboxylic acid products could provide a new method of targeting and killing cancer cells.

Title: **Morphological Changes in *Xenopus laevis* Tadpoles' Guts When Exposed to Polyethylene Microplastics in Water**
Student(s): Mikayla-Anne Woodring
Advisor(s): Dr. Sara McClelland

Microplastics are a pollutant that can be found in every ecosystem on Earth. Despite how widespread these pollutants are, their effects on many species are still unknown. Aquatic species' exposed to high levels of microplastics have had negative impacts when looking at both behavioral and physiological changes. Impacts of environmentally realistic levels of microplastics are less understood. This makes examining bioindicator species, such as tadpoles, a critical step to understanding the effects of microplastics within aquatic ecosystems. This study examined *Xenopus laevis* tadpoles and the effects of microplastics on the gut morphology of tadpoles post-mortem. Tadpoles were exposed to either no microplastics or 10 ug/L of microplastics. After three weeks of exposure, normality of gut coiling, number of gut coils in the intestines, and gut length were measured. The results showed that *Xenopus laevis* tadpoles exposed to microplastics had shorter gut lengths and fewer gut coils. These results confirm a change in gut morphology in *Xenopus laevis* tadpoles exposed to microplastics. More research is needed to determine how this may change digestion efficiency. Understanding the impacts of microplastics on amphibians can provide insights into the effects of plastic pollution in aquatic ecosystems and contribute to global conservation efforts.

Title: **A Comparison of CME and CIR Geomagnetic Storms Using ENA Measurements**
Student(s): Andrew Younes
Advisor(s): Dr. Keith Wood

While the difference in effects from CME and CIR storms is often subtle, the risks they pose to Earth and space-based infrastructure are somewhat different. The rapid onset of CME events tends to lead to more rapidly changing magnetic fields in the lower atmosphere. This has the potential to induce large currents in our electric power grids, destroying transformers and leading to wide-spread blackouts. Alternatively, the hotter particles emitted during a CIR storm, combined with the typically longer duration, lead to a very dangerous environment for satellites. The loss of even a few satellites can lead to issues with world-wide communications and cost many billions of dollars to repair. In this project, we have taken several steps with the goal of discovering differences in magnetospheric or ionospheric currents between the two types of storms. First, we have examined publicly available data on the solar wind and magnetosphere using Goddard Space Flight Center's OMNIWeb during the interval in which the Two Wide-angle Imaging Neutral-atom Spectrometers (TWINS) mission was active (2006-2013). All geomagnetic storms have been recorded and analyzed for determination of type. Two storms were selected: a CME which occurred on the 17th of March, 2015, and a CIR which occurred on June 1st, 2013. TWINS data for each of these storms has been used to calculate magnetospheric currents at the Earth's northern ionosphere at multiple times throughout each storm. Differences in the structure of the currents are noted.

Title: **Extraction and Quantification of Fluoxetine (Prozac) in Seawater**
Student(s): Johanna Zimmerli
Advisor(s): Dr. Alison Holliday

Fluoxetine, better known as Prozac, is a commonly prescribed antidepressant that can persist in many wastewater systems. This means that it can enter the aqueous environment and potentially cause harm to the well-being of aquatic animals. The purpose of this research is to develop effective methods to quantify fluoxetine in various seawater samples. The expected concentration of any fluoxetine present in seawater is expected to be on the order of nanograms per liter. Solid phase extraction (SPE) is used with Chromabond HR-X cartridges that can capture Prozac molecules and elute them to carefully increase the concentration. Then, the eluted molecules are analyzed through liquid chromatography-mass spectrometry (LC-MS).