



Promoting Interdisciplinary Conversations

2024 Western Research Day Schedule

Friday, May 3, 2024

10:00- 11:00 – Opening Remarks and Keynote Address

11:00-12:30- Poster Session

12:30 – 1:00- Light Refreshments

1:00- 1:30- Closing Remarks and Provost Awards

2024 Keynote Speaker



Albert Garcia-Romeu, Ph.D. is an Associate Professor of Psychiatry and Behavioral Sciences at the Johns Hopkins University School of Medicine. His research examines the effects of psychedelics in humans, with a focus on psilocybin as an aid in the treatment of addiction. His current research interests include clinical applications of psychedelics, real-world drug use patterns, diversity in science, and the role of spirituality in mental health. He is a founding member of the Johns Hopkins Center for Psychedelic and Consciousness Research and the International Society for Research on Psychedelics. He serves on the Board of Directors for the College on Problems of Drug Dependence (CPDD) and is an Associate Editor for the journal *Psychedelic Medicine*.

Student Participants

Poster Number	Name	Major
1	Sara Azzi	Psychology
2	Jonathan Bell	Chemistry
3	Amiyah Buan	Chemistry and BioChemistry
4	Sofia Coconi	Biology
5	Emily Coelho	Chemistry & Applied Mathematics
6	Chris Colavito	JLA
7	Hannah Daly	Biology
8	Kayla Deguzman	MS in Integrative Biological Diversity
9	Dariel Estevez Llaverias	JLA
10	Sarah Fayad	English
11	Michael Figueroa	Psychology
13	Francesca Goncalves	English
14	Olivia Hoft	MS Applied Behavior Analysis/Educational Psychology
15	Lauren Ifkovits	Biology
16	Erin Lowenadler	Secondary Education - English
17	Chloe Marquardt	Anthropology
18	Matthew Martins	Biology
19	Amelia McGee	Literature
20	Keondre Miller	Chemistry
21	Andrew Minchala	Biology
22	Christian Mollica	Biology
23	Kylie Moody	Psychology
24	Paige Muscillo	JLA
25	Bridget Nicholson	Biology
26	Isabella Ostoic	Public Health
27	Steven Pancurak	Biology
28	Nicole Peralta	JLA
29	Adam Psenicnik	Applied & Computational Math
30	Sara Risko	Department of History, Philosophy & World Perspectives
31	Keyner Rojas	Biology

32	Alton Spencer	Earth and Planetary Science (under Department of Biology)
33	Erik Staib	English
34	Kwan Stowell	English
35	Cole Strang	Biology
36	Michael Tambascio	Biology
37	Jocelyn Villacreses	Biology
38	Megan Wiese	JLA
39	Sandra Zapata-Ramirez	Masters of Integrative Biological Diversity

Judges

Name	Department
Gloster Aaron	Neurobiology (Wesleyan)
Katherine Allocco	History
Hasan Arslan	JLA
Paulina Assenza	Management
Galina Bakhtiarova	Languages
Kim Bridges	Nursing
Eileen Campbell	Nursing
Neeta Connally	Biology
Patricia Cumella	Nursing
Melissa Dalton	HPX
Jennifer Flynn	MIS
Ellie Gonzalzas	BIO secretary
Pauline Goolkasian	Doctoral Advisor
Alba Hawkins	Languages (Spanish)
Krista Heybruck	HPX
Rayda Krell	Biology
Stephanie Kuhn	Education
Bryan Lewis	Hospital
Leslie Lindenauer	History
Rotua Lumbantobing	Finance
Jeanette Lupinacci	Nursing
Ron Mason	Housing
Julia Mazurk	Nursing
Thomas Miller	JLA
Mary Murphy	Psychology
Jennifer O'Brien	Library
Bozena Padykula	Nursing
Amy Parent	Westport teacher
Julie Perrelli	Interim Dean of Success & Engagement
William Petkanas	Communication
Dora Pinou	Biology
Helena Prieto	Chemistry

Teresa Puckhaber	Nursing
Hanah Reynolds	Biology
David Rollison	Westport teacher
Dylan Sprague	Library
Brian Stankus	Chemistry
Alicja Stannard	HPX
Mitch Wagener	Biology
Qur-an Webb	Social Work

Faculty Participants

Name	Department
Arslan, Hasan	JLA
Bandhauer, Carina	Anthropology
Brewer, Adam	Educational Psychology
Christofi, Stavros	Chemistry
Cordeira, Joshua	Biology
Gee, Bernard	Psychology
Giamanco, Kristin	Biology
Gianninas, Alexandros	Biology
Greco, Nicholas	Chemistry
Heather, Levy	English
Hornbostel, Victoria	Biology
Levy, Heather	English
Malavisi, Anna	Philosophy
Monette, Michelle	Biology
Murphy, Mary	Psychology
Pinou, Theodora	Biology
Reynolds, Hannah	Biology
Santibanez-Lopez, Carlos	Biology
Schlicht, Jeffrey	Public Health
Sharma, Divya	JLA
Stankus, Brian	Chemistry
Tom, Jack	Art
Usekes, Cigdem	English
Wong, Edwin	Biology

Student Abstracts

1	<p>Mental rotation learning with task-specific interventions <i>Sara Azzi</i> with: Jade E. Carriero</p> <p>Advisor: <i>Bernard Gee, Psychology</i></p> <p>Spatial reasoning is a cognitive skill necessary for understanding and navigating our physical environment. Mental rotation, in particular, is our ability to visualize objects rotated at different angles. Prior research has indicated that hand movements can enhance mental rotation performance, a theory known as embodied cognition. We further explored this theory by designing an intervention in which subjects "played" with 3-dimensional toy blocks similar to those found on a standard mental rotation test. The control group simply watched videos of the task being completed by others. We hypothesized that the hands-on interaction used by the embodied group would facilitate higher accuracy and processing speed on the mental rotation post-test. Our data showed that both groups slightly improved their mental rotation scores, with the embodied group improving slightly more than the video group. Reaction time remained the same for the video group while the embodied group experienced an increased reaction time.</p> <p>URL for poster: Click to view</p>
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2	<p>Correlation of Molecular Structure with Photophysical Properties <i>Jonathan Bell</i></p> <p>Advisor: <i>Brian Stankus, Chemistry</i></p> <p>Machine Learning (ML) is a subdivision of artificial intelligence and is a powerful tool that has changed how problems are solved throughout several industries. This multi-semester project aims to create and test several ML algorithms that will predict the fluorescence and/or singlet oxygen quantum yield of a given light-absorbing molecule (photosensitizer). Throughout this semester, ML techniques have been explored and implemented to create a method to rank photosensitizers regarding fluorescence quantum yield. The ML algorithm will use the structural characteristics of these photosensitizers to predict their photophysical properties. This work will be applied to a cancer treatment called photodynamic therapy (PDT), in which the excited photosensitizers will generate singlet oxygen that destroys cancer cells. The quantum yield values predicted by the ML algorithm will allow us to choose and design sensitizers that are optimized for PDT.</p> <p>URL for poster: Click to view</p>
3	<p>Structure of Therapeutic DNA Aptamer <i>Amiyah Buan</i></p> <p>Advisor: <i>Nicholas Greco, Chemistry and BioChemistry</i></p> <p>Since the discovery of the double helix, scientists have been modifying the structure of the native nucleotides in order to modulate their properties. Nucleotide modifications have focused on synthetically modifying the sugar, backbone or nucleobase. These modified isomorphous fluorescent nucleobases have been utilized to probe duplex formation, small molecule binding, and polarity of DNA grooves, with minimal perturbation to the system. While these studies provide experimental evidence of aptamer binding, the overall structure and dynamics of the aptamer is unknown. This project utilizes nucleobase probe, 5-(fur-2-yl)-2'-deoxyuridine, to investigate the structure and dynamics of a novel DNA aptamer, F5R1. Recent studies have shown its high affinity and specificity for α-synuclein whereby a reduction in aggregation could prevent non-specific ion channel formation, suggesting its use as an antiepileptic therapeutic. This project employs UV and fluorescence spectroscopy to develop a better picture of the overall structure and dynamics of F5R1.</p> <p>URL for poster: Click to view</p>

4	<p>Unraveling the Mysterious Perineuronal Net: Formation in a Hyaluronan-Independent Manner <i>Sofia Coconi</i> with: David Herberger, Bridget Nicholson</p> <p>Advisor: <i>Kristin Giamanco, Biology</i></p> <p>In the central nervous system, perineuronal nets (PNNs) surround a variety of neurons. PNNs are located within the extracellular matrix and are hypothesized to regulate synaptic plasticity. We lack a complete understanding of the formation and interactions between components of PNNs. Aggrecan is a proteoglycan found in PNNs, playing an essential role in attachment to the cell surface. Hyaluronan mediates the consolidation of aggrecan around the cell. We used culture models to understand how these structures form and to decipher the molecular relationships that underlie PNNs. We found that cells that express mutant forms of aggrecan that cannot bind to hyaluronan still display aggrecan expression at the cell surface, calling into question how PNNs complex. We focused on identifying other molecules that may act in the place of hyaluronan, providing insight into how PNNs assemble. Understanding how PNNs form can help us combat neurodegenerative diseases linked to abnormally structured PNNs.</p> <p>URL for poster: Click to view</p>
5	<p>Photochemical Kinetics of Volatile Organic Compounds <i>Emily Coelho</i></p> <p>Advisor: <i>Stavros Christofi, Mathematics; Brian Stankus, Chemistry</i></p> <p>Photochemical processes are primary drivers of chemical change in the atmosphere. Through bimolecular collisions, radicals that are formed initiate a cascade of complex reactions, including the breakdown of ozone and formation of fine organic aerosols. These are responsible for volatile organic compounds (VOCs), which are presently a subject of active research. In our interdisciplinary study, we aim to investigate the effects of a derivative of a VOC, Pinonic Acid, that has harmful impact on the environment. We will 1) use Cyclobutyl Ketone (CBK) as it has a similar structure to Pinonic Acid, 2) use GAMESS to simulate a variety of IR spectra, and 3) use a UV light source to initiate the reaction and monitor the molecular spectra using time-resolved FT-IR spectroscopy. We will analyze the results by expressing chemical reaction pathways as a system of differential equations (ODEs), and hence develop a set of functional forms describing the product concentrations as a function of time.</p> <p>URL for poster: Click to view</p>

6	<p>DUI Recidivism: What Works? <i>Chris Colavito</i></p> <p>Advisor: <i>Divya Sharma, JLA</i></p> <p>This study will evaluate various methods of penalties for first-time DUI offenses and their effectiveness in correlation to recidivism rates. These methods will include pre-trial alcohol prevention programs, monetary fines, license suspensions, and possible incarceration. CGS § 54-56g mandates offenders to complete an approved victim impact panel, such as Mothers Against Drunk Driving in return for charges being dismissed. The purpose of victim impact panels allow victims of DUI offenses to communicate their grief to first-time offenders with the goal of empathy deterring repeat offending. Alternative to prevention programs, CGS §§ 14-227a and -227b may impose offenders with penalties such as monetary fines, suspended driver's licenses, and possible incarceration. In correlation with these penalties, this evaluation will look at data on recidivism rates for Connecticut and compare national offenders. This study will make use of secondary sources such as journal articles, agency reports, and crime databases.</p> <p>URL for poster: Click to view</p>
7	<p>Marine Diversity Seen Through the Lens of Loggerhead Sea Turtles (<i>Caretta caretta</i>) <i>Hannah Daly</i></p> <p>Advisor: <i>Theodora Pinou, Biology</i></p> <p>Marine turtles play a vital role in hosting the most abundant and diverse communities of epibionts. Epibionts can live on the sea turtle symbiotically by inhabiting the soft tissue and the carapace. Research on epibionts on marine turtles has increased with new species being described and the creation of models to investigate how environmental parameters may affect abundance and diversity of epibionts. Marine invertebrates are useful bioindicators for water quality, so understanding how their community changes can tell us how the environment is changing. While at the lab of Invertebrate Zoology at the Yale Peabody Museum, 44 samples of epibionts collected off nesting loggerhead and green sea turtles were quantified and identified to the lowest taxonomic level possible. 46 different species were identified, with some having notable remarks upon discovery. One species being found in a recently new location, supporting the idea that sea turtles transport these marine invertebrates.</p> <p>URL for poster: Click to view</p>

8	<p>Testing loon-associated <i>Aspergillus fumigatus</i> for antifungal resistance <i>Kayla Deguzman</i></p> <p>Advisor: <i>Hannah Reynolds, Biology</i></p> <p><i>Aspergillus fumigatus</i> is a saprophytic fungus and opportunistic pathogen. The typical route of infection is inhalation of small, airborne conidia that are deposited and grow in the lungs. Immunocompromised patients are at risk for invasive aspergillosis, with a mortality rate of 40%–90%, and antifungal resistance is a growing concern. As <i>Aspergillus</i> species infect from the environment, it is beneficial to know how widespread antifungal resistance is in non-medical strains. Birds are susceptible to <i>A. fumigatus</i>, and these infections are a common cause of death in the common loon (<i>Gavia immer</i>). The goal of this study was to determine the antifungal resistance of a collection of <i>A. fumigatus</i> isolated from the respiratory systems of deceased common loons, including those with noticeable fungal respiratory disease. Triplicate assays on RPMI agar were performed to test the efficacy of Amphotericin B and Itraconazole, two commonly prescribed antifungals.</p> <p>URL for poster: Click to view</p>
9	<p>American Dream - A Criminological Analysis <i>Dariel Estevez Llaverias</i> with: Kevon P. Patrick</p> <p>Advisor: <i>Divya Sharma, Justice and Law Administration</i></p> <p>This research examines the concept of the American Dream, from its conception to how it has been challenged over the decades. Specifically, it explores how the American Dream has been interpreted, used to drive expectations for the citizenry, and how failure in those expectations are manifested in criminology. The cultural messaging of the American Dream exposes a gap between one’s societal goals and one’s means of achieving them. Secondary sources were used to perform theoretical analysis linking the American Dream to trends in criminal justice in the U.S. The conclusion of this research offers some recommendations for criminal justice professionals and how the American Dream can inform the values applied in community policing.</p> <p>URL for poster: Click to view</p>

10	<p data-bbox="423 174 1365 289">Believing is Hearing: How the Voice of Others Warps Identity and Alters Perception of Self in Michelle Cliff's <i>Abeng</i> <i>Sarah Fayad</i></p> <p data-bbox="423 369 1330 399">Advisor: <i>Cigdem Usekes, Department of English and Interdisciplinary Studies</i></p> <p data-bbox="423 443 1409 856">The nature vs nurture debate is still fiercely discussed by psychologists and scientists alike. The consensus is that both genetics and environment play a role in shaping character and identity. Yet, one could argue that friends and family have an undeniable effect on a developing individual. This is demonstrated as Clare Savage of Michelle Cliff's 1984 novel <i>Abeng</i> struggles to form an authentic sense of self due to the beliefs, prejudices, and influences of her kin. Set in 1950s Jamaica, <i>Abeng</i> is the story of a young girl navigating the physical and emotional turmoil of puberty. <i>Abeng</i> attests to the immense influence of those closest to us; Clare's intersectional identity as a queer, bi-racial woman is altered and transformed as she matures and faces the pressures of external forces. This paper explores how the voice of others affects Clare's sense of self, perhaps even more so than her own.</p> <p data-bbox="423 905 605 966">URL for poster: Click to view</p>
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11	<p data-bbox="423 174 1401 296">Feasibility and acceptability of using computer-based counseling simulation training in an Addiction Studies graduate curriculum</p> <p data-bbox="423 306 636 336"><i>Michael Figueroa</i></p> <p data-bbox="423 415 841 445">Advisor: <i>Mary Murphy, Psychology</i></p> <p data-bbox="423 485 1409 1050">This pilot study investigates the integration of computer-based counseling simulation training into the WCSU M.S. in Addiction Studies curriculum over a five-week period. Eight graduate students (37.5% male, 62.5% female) participated, utilizing the SkillSetter© website—a web-based counseling simulation tool—to enhance core counseling skills through interactive video exercises and self-reflection prompts. The study included seven client simulation homework modules covering active listening, reflections, client engagement, and managing therapeutic ruptures. Students received didactic instruction in class and completed SkillSetter homework assignments by watching client recordings and uploading video responses. Feedback on SkillSetter usage was collected from both students and professors, focusing on satisfaction, usefulness in skill acquisition, and changes in confidence levels pre- and post-study. Data analysis encompasses student satisfaction, effectiveness in acquiring counseling microskills, and confidence level changes. Findings from this study will inform potential curriculum adjustments aimed at enhancing the effectiveness of counseling training within addiction studies programs.</p> <p data-bbox="423 1094 605 1155">URL for poster: Click to view</p>
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13	<p>I Don't Want You to Repeat: Unpacking Machado's In the Dream House <i>Francesca Goncalves</i></p> <p>Advisor: <i>Heather Levy, English</i></p> <p>Carmen Maria Machado's memoir <i>In the Dream House</i> dissects the unexpected souring of a love gone vicious. Machado's use of non-linear storytelling, second-person narration, and meta-textual elements not only reflects the disorienting experience of abuse but also critiques the scarcity of queer narratives in mainstream literature. This essay integrates theoretical frameworks from Virginia Woolf, James Baldwin, and others for its approach in 'queering the archive,' contesting conventional narrative structures, and highlighting the systemic erasure of marginalized voices. Machado's memoir serves as a personal catharsis, and a strategic tool to expand the discussion of LGBTQ+ issues. While advocating for a reconstitution of societal and historical narratives, Machado's narrative thus calls for a more nuanced understanding of humanity in its entirety.</p> <p>URL for poster: Click to view</p>
14	<p>Relapse of Social Avoidance in Autism compared to Neurotypical <i>Olivia Hoft</i></p> <p>with: Cintia Gonclaves, Isabelle Molteni, Aaron Arellano, Dr. Stephanie Kuhn, and Dr. Adam Brewer @ WCSU; Dr. Mike Schlund @ Georgia State University</p> <p>Advisor: <i>Adam Brewer, Educational Psychology</i></p> <p>Laboratory models are used to study relapse of fear relying on physiological and self-report measures. An important aspect is missing which is crucial for understanding anxiety disorders in autism—the behavior of choosing to avoid or approach threats associated with fears. In our ongoing laboratory study, we used an approach-avoidance (AP-AV) decision-making task to assess relapse of social avoidance in an autism group (n=1) compared to neurotypical (n=9). We used an A-B-A design where participants acquired fear learning in context A, underwent extinction learning in context B, and were returned to context A to assess relapse. Money was given or taken away based on choices participants made. Results showed exposure treatment reduced avoidance and returning to the context where fear was originally acquired resulted in relapse for all. Thus, the context acted as a 'trigger' for relapse because extinction learning did not generalize to other contexts.</p> <p>URL for poster: Click to view</p>

15	<p>Differences in Oral Bacteria Between Humans and Canines <i>Lauren Ifkovits</i> with: Aileen Perez, Jenny Phinit</p> <p>Advisor: <i>Edwin Wong, Biology</i></p> <p>The oral bacteria in pets and animals are linked to health complications such as gingivitis, cavities, and tooth decay. Previous research has found that pet canines can harbor potential zoonotic pathogens which may be dangerous to humans. Other studies found about a 4.8% overlap in the oral bacteria of both humans and canines. In this study, the oral cavities of both canines and humans were sampled for bacteria. The bacterial DNA barcode gene for 16S rRNA was amplified by polymerase chain reaction (PCR). The DNA samples were sequenced to determine which bacteria are present in the oral cavities of canines and humans.</p> <p>URL for poster: Click to view</p>
16	<p>Shaping The Mind of Students: How Should Educators Be Teaching Literature, And to What Extent? <i>Erin Lowenadler</i></p> <p>Advisor: <i>Heather Levy, English</i></p> <p>Reading is a fundamental task of living, but students are shying away from reading for leisure and for academics. There are several factors that influence this downfall. However, the way English is being taught and the ways students are being engaged in the classroom are the main contributors. This study aims to discover ways teachers can better engage students, identify texts that students value, and implement the love of literature in future generations. Through analyzation of scholarly journals and books that support reading growth, it was found that teachers can transform students into active readers by focusing on real-world applications, establishing reading flow, and practicing engaging techniques in school. It is not the books that students are reading that are turning students away - it's the pedagogy teachers implement. Teachers must identify these factors to promote the everlasting effects that reading can have on an individual's life.</p> <p>URL for poster: Click to view</p>

17	<p>The Effects of the American Archaeological Process on Native Americans <i>Chloe Marquardt</i></p> <p>Advisor: <i>Carina Bandhauer, Anthropology</i></p> <p>This study is exploring the evolution of policy surrounding Native American history and artifacts, how they play into the archaeological process, and how they affect Native American communities. Throughout this study, I used scholarly sources and public government records, utilizing both to find out about policy changes over time and the effects on Native Americans and their heritage. Through the use of these, I found that policy change, while a great improvement, still does not have the intended effect for the Native Americans, and many find the new policy to be exclusionary as well as ineffective.</p> <p>URL for poster: Click to view</p>
18	<p>Analysis of Bacterial Communities in Kitchen Drains <i>Matthew Martins</i> with: Ashley Chagas and Judy Nguyen.</p> <p>Advisor: <i>Edwin Wong, Biology</i></p> <p>Although kitchen drains are dynamic ecosystems that support a variety of bacterial species, little is known regarding biodiversity and ecological importance. To clarify the diversity and possible ramifications for microbial ecology and public health, this study looks at the microbial makeup of kitchen drains. Bacterial populations from kitchen drain samples were obtained from students attending Western Connecticut State University, Danbury, CT. Samples were processed and examined using methods such as PCR, 16S rDNA sequencing, and BLAST analysis. The existence of diseases that take advantage of opportunities highlights how crucial it is to comprehend the dynamics of microbes in homes. The insights derived from this study provide important implications for managing public health, antibiotic resistance, and ecosystem functioning by illuminating the intricate connections that shape microbial populations in household kitchen drains.</p> <p>URL for poster: Click to view</p>

19	<p>Shakespeare's Tragic Figures Descent into Madness and its Correlation with Themes of Love and Respect <i>Amelia McGee</i></p> <p>Advisor: <i>Heather Levy, English</i></p> <p>King Lear, Hamlet, and Othello are Shakespeare's most well known and studied tragedies throughout the academic and theatrical world. Despite their popularity, the plays have many misconstrued analyses. The superficial analysis of these plays begins with their interpretation of a descent into madness. Insanity and madness are described as a result of what analysts perceive to be the main corruptor. They claim that the main character's descent into madness is seen as a product of old age, familial death, and unfaithfulness. In fact, these character's descent into madness is not a symptom of old age, familial death, or unfaithfulness. Their fall into insanity is triggered by themes and actions of love. Shakespeare's King Lear, Hamlet, and Othello explores how characters make contributions, including the title character, to demonstrate that madness has more to do with love and respect than with the perceived corruptors of old age, familial death, and unfaithfulness.</p> <p>URL for poster: Click to view</p>
20	<p>Light-Induced Reactions of Photoactive Molecules <i>Keondre Miller</i></p> <p>Advisor: <i>Brian Stankus, Chemistry</i></p> <p>Allura red AC (aka "Red 40") is an azo dye that is found in everyday candies and chocolates to provide a red color. In other countries, and even in some parts of the United States, this chemical has recently been banned because it is a possible carcinogen and may cause other health problems. In spite of these recent bans, extensive usage of this compound over the past few decades has caused a significant concentration of Red 40 to build up in wastewater. Contaminants in wastewater are commonly removed via UV radiation treatment, however, Red 40 is resistant to photodegradation because of its strong azo bond. In this project, we aim to find the most efficient way remove Red 40 from wastewater by introducing a photocatalyst at various conditions and by monitoring the decay of Red 40 concentration over time.</p> <p>URL for poster: Click to view</p>

21	<p>The Effect of Exercise on Monoamine Neurotransmitters in the Nucleus Accumbens <i>Andrew Minchala</i> with: Derek Gustafson</p> <p>Advisor: <i>Joshua Cordeira, Biology</i></p> <p>We wanted to study how the brain's control of high-fat food intake is improved by exercise. We focused our attention on the nucleus accumbens, a brain region that uses dopamine signaling to control high-fat food intake. We hypothesized that exercise improves control of high-fat food intake by increasing dopamine signaling in the nucleus accumbens. To test this, we dissected the nucleus accumbens from exercise and sedentary mice fed very high-fat food. Then, we submitted the samples for HPLC-ECD analysis of neurotransmitter content. Exercise significantly increased serotonin but had no effects on dopamine, norepinephrine, or epinephrine signaling. Results indicate a possible role for serotonin signaling in the nucleus accumbens as a mechanism by which exercise can modify high-fat feeding behavior. Just as exercise has many health benefits, serotonin also has many functions in the body. It's crucial to continue studying the role of serotonin in the health benefits of exercise.</p> <p>URL for poster: Click to view</p>
22	<p>Bacterial Community Structure of Compost at Different Decomposition Stages <i>Christian Mollica</i> with: Adam Psenicnik and Jonathan Bell</p> <p>Advisor: <i>Edwin Wong, Biology</i></p> <p>Composting is a process that can occur through several means, but all methods rely on using microbes to break down organic matter into nutritive food for plants. In active composting, organic matter is carefully monitored and actively agitated and aerated to ensure proper conditions for microbes producing pathogen free compost in a short amount of time. Static pile composting is a passive method, piling the material to compost together and having the organic matter naturally degrade over a long period of time. We collected samples at different depths of a static compost pile consisting of waste material from horse stalls. We characterized the bacterial community using the 16S ribosomal RNA gene as a genetic barcode. The resulting 16S sequences identified the distinct bacterial communities at each depth and how they might be influenced by static pile composting.</p> <p>URL for poster: Click to view</p>

23	<p>Biofeedback as an emotion regulation tool for cognitive stress in college students: A systematic review <i>Kylie Moody</i></p> <p>Advisor: <i>Mary Murphy, Psychology</i></p> <p>Cognitive stress is a common experience college students face in their personal and academic lives. To manage this stress, individuals employ a variety of methods to regulate their emotions. Emotion regulation is an executive function that involves being able to control emotional processes, physiological responses, thoughts, and behaviors. Effective brief interventions are needed to help college students manage cognitive stress. One promising area is the use of biofeedback. The study will conduct a systematic review of the literature published on the use of biofeedback techniques among college students. A bibliographic search will be conducted using PRISMA guidelines to review all intervention studies completed between 2010 - 2023 including the search terms: heart rate variability biofeedback, cognitive stress, and college students. The search will utilize Scopus, PsycArticles, PsycInfo, PubMed, and Academic Search Premier. Exclusion criteria will include studies completed outside of the time range, outside the US, and papers</p> <p>URL for poster: Click to view</p>
24	<p>The White-Collar Criminal: The World of Greed and the Delivery of American Justice <i>Paige Muscillo</i></p> <p>Advisor: <i>Hasan Arslan, JLA</i></p> <p>White collar crime and the world of greed refers to the intersection between unethical or illegal activities typically associated with individuals in positions of power or authority within the corporate or business world. In today's digital era, white-collar crime has surged in prevalence globally. Drawing upon various open sources such as court records, news articles, and online databases, this study meticulously compiles an extensive overview of trends, patterns, and factual data pertaining to white-collar criminals. Furthermore, the research delves into the prevalent types of such crimes, including money laundering, healthcare fraud, securities fraud, and credit card fraud. Motivated by personal experience as a credit card fraud victim, this research's primary objective is to illuminate the statistical realities of white-collar crimes and examine how these offenses are handled within the American criminal justice system.</p> <p>URL for poster: Click to view</p>

25	<p>Deciphering Perineuronal Net Formation: Exploring the Role of Aggrecan in Cell Surface Attachment <i>Bridget Nicholson</i></p> <p>Advisor: <i>Kristin Giamanco, Biology</i></p> <p>The perineuronal net (PNN) is a structure found within the extracellular matrix (ECM) in the nervous system. It has been hypothesized that PNNs modulate neuronal plasticity, and despite this important function, the mechanisms underlying PNN formation are not entirely understood. We used immortalized C6 cells to examine how PNNs are constructed, which components are necessary for their formation, and how chemical agents alter their formation. More specifically, we investigated the chondroitin sulfate proteoglycan, aggrecan, and how it binds to the cell surface. Aggrecan is a key activity-dependent component of PNNs and an integral structural element that facilitates the binding of PNNs to the cell surface. Abnormal structure and function of PNNs has been implicated in the development of neurodegenerative diseases such as Alzheimer's. A more thorough and precise understanding of these structures could provide insight into how and why these diseases occur and lead to the discovery of new treatments.</p> <p>URL for poster: Click to view</p>
26	<p>Second party assessment of RPE during strength training: a systematic review <i>Isabella Ostojic</i></p> <p>Advisor: <i>Jeffrey Schlicht, Public Health</i></p> <p>To identify any studies utilizing second party assessment of Rating and Percieved Exertion (RPE) during strength training. METHODS: In order to initiate the search, the authors arranged a set of search terms utilized in the following databases: AMED, CINAHL, Embase, MEDLINE, PubMed, PEDro, SPORTDiscus and PreMEDLINE. The search was conducted twice, once in March 2023 and a second time in September 2023. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. RESULTS: Eligibility for articles were assessed and no articles were found to be relevant (n=0). DISCUSSION: Second party assessment could improve online exercise experience, telehealth, athletes' workouts, and research protocols for exercise training in the home. Results suggest further research should be conducted to see if second party assessment is valid and reliable in strength training</p> <p>URL for poster: Click to view</p>

27	<p>Effects of warm acclimation on the thermal tolerance of Atlantic Killifish (<i>Fundulus heteroclitus</i>) Steven Pancurak</p> <p><i>Advisor: Michelle Monette, Biology</i></p> <p>I seek to determine whether exposure to constant and fluctuating warm temperature impacts the thermal tolerance of Atlantic killifish (<i>Fundulus heteroclitus</i>), an estuarine fish inhabiting the east coast of North America. Killifish were acclimated to three temperature groups: control (20°C), constant warm (28°C), and variable warm (20-28°C, shifting every 2 days) for 4 weeks. Maximum tolerable temperature (or critical thermal maximum, CT_{max}) was measured along with blood and gill tissue parameters. Warm acclimation led to an increase in mean thermal tolerance, as measured by CT_{max} (37.1°C control, 40.7°C constant warm, 39.8°C variable warm), but shifts in hematocrit and gill heat shock protein expression did not underlie improved tolerance. Next, we will conduct histological analyses to measure interlamellar cell masses of the gill, to examine whether gill remodeling is a cause of improved tolerance. Our results suggest that killifish have the physiological capacity to acclimate to climate change induced warming.</p> <p>URL for poster: Click to view</p>
28	<p>Unveiling Shadows: A Decade-by-Decade Analysis of Human Trafficking Portrayal in Tri-State Media (1980-2020) Nicole Peralta</p> <p><i>Advisor: Hasan Arslan, JLA</i></p> <p>The U.S. became a "source, transit, and destination country for men, women, and children subjected to trafficking in persons, specifically forced labor, debt bondage, and forced prostitution." But how prevalent is such news on human trafficking in the US media? This study solely focuses on the "forced labor" news reported in the media in the tri-state area (CT-NY-NJ) between 1980 and 2000. This data is then meant to be compared to "forced labor" news reported in the media in the tri-state area (CT-NY-NJ) between 2000 and 2022. Using the Access World News and the criminal statutes of the three states, the explorative study examines the frequency of human trafficking news reporting "forced labor" cases. The issue is how much media coverage exists on "forced labor" in the heart of the US economy pre-2000 era vs post-2000 era.</p> <p>URL for poster: Click to view</p>

29	<p data-bbox="423 172 1414 254">Dimensionality Reduction Reveals Entanglement & Difficult M.L. Classification of Scorpion Toxin Non-Toxin Protein Sequences.</p> <p data-bbox="423 260 618 289"><i>Adam Psenicnik</i></p> <p data-bbox="423 367 922 396">Advisor: <i>Carlos Santibanez-Lopez, Biology</i></p> <p data-bbox="423 438 1414 894">Scorpion venoms are a complex cocktail of toxins, lipids, proteins, enzymes, and other small molecules with many toxins having therapeutic purposes such as drug delivery and having antimicrobial and anticancer properties. To aid in identifying potential toxins from transcriptomes machine learning and artificial intelligence can be used to classify sequences as toxins or non-toxins. To assess the feasibility of established machine learning methods for this task, dimensionality reduction techniques were used to assess how the sequences grouped together in a low dimensional space and as preprocessing for machine learning classification techniques. Using limited discriminative analysis, principal component analysis, and uniform manifold approximation and projection for dimensionality reduction along with linear regression and support vector machines for classification showed that many of these toxin and non-toxin sequences are highly entangled in low dimension spaces and are resistant to traditional methods of M.L. classification.</p> <p data-bbox="423 938 607 968">URL for poster:</p> <p data-bbox="423 974 578 1003">Click to view</p>
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30	<p>Determining Anthropocentric Right Action for Equitable Biospheric Outcomes <i>Sara Risko</i></p> <p>Advisor: <i>Anna Malavisi, Department of History, Philosophy & World Perspectives</i></p> <p>Climate change is the largest collective threat we have encountered as a dynamically interdependent community of human, non-human, and plant species alike. In the face of such adversity, we must assess right action to obtain equitable outcomes for all beings. Through our role as the dominant species, we are instrumentally capable of supporting human and non-human beings; meaning we should feel an inherent need to address both current and future anthropogenic damages, ensuring that all may flourish. While this is no easy feat—human dominion, convenience, short-sightedness, ethical avoidance, etc. all being barriers of particular note—it is our responsibility, as beings capable of reasoning and sentience, to put aside our own inherent sense of entitlement, realize our shortcomings, and identify how we may overcome them. This piece aims to do just that, providing a collection of research to support such claims and provide guidance for future success.</p> <p>URL for poster: Click to view</p>
31	<p>CRISPR-CPF1 Mediated Knockout of the McyA Gene <i>Keyner Rojas</i></p> <p>Advisor: <i>Edwin Wong, Biology</i></p> <p>Cyanobacteria have been around since the earliest days of life. They are often credited with being one of the major contributors to the earth's oxygen atmosphere, as they were one of the earliest photosynthetic organisms. Despite their contributions to the development of life, these organisms produce a myriad of toxins such as neurotoxins and hepatotoxins. As these organisms naturally inhabit most of the waterways around the world, they pose a significant risk to human and animal health. In this study, we designed and built a CRISPR-Cpf1 based editing plasmid to knockout the McyA gene, a critical component of the microcystin (hepatotoxin) operon, and thus shutting down toxin synthesis.</p> <p>URL for poster: Click to view</p>

32	<p>Archived HARPS observations reveal a rocky Super-Earth around HD 61051 (TOI-1011) <i>Alton Spencer</i></p> <p>Advisor: <i>Alexandros Gianninas, Department of Biology (Adjunct)</i></p> <p>I report the detection and characterization of a transiting Super-Earth-sized planet in a 2.5-day orbit around the Sun-like star HD 61051 (TOI-1011). The host star was observed in 3 sectors by the Transiting Exoplanet Survey Satellite (TESS) between 2019 and 2023. To confirm the planetary nature of the signal, I combined TESS photometry with archived precise radial velocity (PRV) observations gathered by the ESO's High Accuracy Radial velocity Planet Searcher (HARPS) spectrograph between 2004 and 2021. I found HD 61051 b to be a Super-Earth ($R_p = 1.30 \pm 0.19 R_{\text{earth}}$, $M_p = 5.2 \pm 1.3 M_{\text{earth}}$) with a high bulk density ($\sim 13 \text{ g/cm}^3$), implying a rocky composition with a higher fraction of iron than Earth. HD 61051 b joins a growing population of iron-rich rocky exoplanets and highlights the usefulness of archived PRV observations to rapidly confirm and characterize Level 1 science targets from TESS.</p> <p>URL for poster: Click to view</p>
33	<p>The Portrayal of Good vs Evil in Storytelling Through the Lens of The Lord of The Rings <i>Erik Staib</i></p> <p>Advisor: <i>Heather Levy, English</i></p> <p>The parallels between good and evil and more specifically between a hero and a villain is one of the most common narratives that authors utilize in writing to help illustrate themes in their texts, dating back to the time of Beowulf. A more modern depiction of these parallels can be found in J.R.R. Tolkien's "The Lord of the Rings" trilogy. The distinction between heroes and villains and by correlation good versus evil transcends simplistic dichotomies of good and evil. Characters' actions, motivations, and relationships interweave to create a nuanced portrayal of moral complexity, challenging conventional notions of heroism and villainy within the narrative tropes.</p> <p>URL for poster: Click to view</p>

34	<p>Beneath the Crown: Women’s Agency in Miss Burma <i>Kwan Stowell</i></p> <p>Advisor: <i>Heather Levy, English</i></p> <p>The theme of women’s agency deeply permeates the narrative of <i>Miss Burma</i> (2017) by Charmaine Craig, which explores Burma's turbulent history from the perspective of a multi-ethnic family. Through a detailed analysis of the female characters who play pivotal roles in the story, this presentation highlights the effect of their decisions, resilience, and actions on their own lives and the broader socio-political landscape of Burma. It reveals the intricate dynamics of identity, power, and resistance that women confront within a patriarchal society amid persistent political upheaval. By focusing on the characters’ experiences, this presentation argues that <i>Miss Burma</i> not only illuminates Burma’s historical turmoil, but also serves as a poignant commentary on the strength and agency of women of color in challenging circumstances. Above all, Craig’s novel stands as an insightful guide for women around the world as they navigate through multifaceted hardships.</p> <p>URL for poster: Click to view</p>
35	<p>Art and Biology: The Process of a Biological Illustration of <i>Fundulus heteroclitus</i> <i>Cole Strang</i></p> <p>with: Interdisciplinary project with the biology and art department</p> <p>Advisor: <i>Michelle Monette (Biology) and Jack Tom (Art)</i></p> <p>Though not always thought of as partners, biology and art go hand in hand. This project merged both to create a biological illustration of the species <i>Fundulus heteroclitus</i>, commonly known as mummichogs. Mummichogs inhabit salt marshes and tidal creeks along the east coast of North America and are notable for their adaptability to changes in salinity, temperature, and oxygen levels. For this reason, they are extremely well suited for the study of fish physiology. To begin, many different fish specimens were examined, pinned, mounted, and photographed. Next, we used tracing paper and graphite pencil to transfer preliminary sketches onto the final drawing surface. A final illustration was produced using a mixed media of watercolor and colored pencil. The ability to communicate findings from physiological studies is enhanced when paired with illustrations of the model organism.</p> <p>URL for poster: Click to view</p>

36	<p>Reducing Bird-Window Collisions at WCSU: Strategies and Efforts <i>Michael Tambascio</i></p> <p>Advisor: <i>Theodora Pinou (Biology) and Jack Tom (Art)</i></p> <p>Reducing bird-window collisions, affecting nearly a billion birds annually in the U.S., is crucial for conservation. This project identified strategies to prevent these incidents and boost public awareness, focusing on urban and suburban areas at higher risk of causing building collisions. It demonstrated the effectiveness of educational exhibits and building deterrents. Methodologies included literature reviews, taxidermy, specimen collection and preparation, and field surveys. Data on bird collisions informed an exhibit with the goal of educating the public on collision prevention, promoting solutions like specific window patterns, external blinds, and light pollution management. These measures significantly reduced collision rates. The project emphasized the importance of preventative measures during high-risk periods, like Spring and Fall migration, and the benefits of initiatives like "Lights Out Connecticut." This study highlights the necessity of educational and practical approaches in effectively mitigating bird-window collisions.</p> <p>URL for poster: Click to view</p>
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37	<p data-bbox="423 174 1279 254">The Role of Osmotic Stress Transcription Factor 1 in the Seawater Acclimation of Atlantic salmon (<i>Salmo salar</i>)</p> <p data-bbox="423 262 651 291"><i>Jocelyn Villacreses</i></p> <p data-bbox="423 369 846 399">Advisor: <i>Michelle Monette, Biology</i></p> <p data-bbox="423 443 1406 898">Atlantic salmon are an anadromous species that hatch in rivers and migrate to the ocean as juveniles. To maintain homeostasis during migration from freshwater to seawater, osmoregulatory proteins in the gill regulate internal ion and water concentrations. We examined the gene expression of osmotic stress transcription factor I (OSTF1) in various salmon tissue, as its role in seawater acclimation of this species remains unknown. To test this, we harvested gill, kidney, intestine, and liver tissue from salmon transferred from freshwater to seawater and investigated OSTF1 gene expression at various timepoints, the impact of handling/transfer, and tissue-specific differences in regulation. After 1 hour, OSTF1 was found to be upregulated in response to handling/transfer alone and seawater transfer in various tissues. Our findings show that OSTF1 is an early response gene that may play a role in the cellular stress response in smolts, particularly in tissues with a direct role in osmoregulation.</p> <p data-bbox="423 940 607 970">URL for poster:</p> <p data-bbox="423 976 578 1005">Click to view</p>
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38	<p>Murder by Fame: The Anatomy of Celebrity Murders <i>Megan Wiese</i></p> <p>Advisor: <i>Hasan Arslan, JLA</i></p> <p>The term "Murder by Fame" encapsulates situations where individuals become targets of violence or harm due to their prominence or public visibility. This phenomenon extends to celebrities, public figures, or those who garnered significant media attention or notoriety. The public's captivation with celebrity homicides is a multifaceted phenomenon influenced by numerous factors. Understanding these dynamics can illuminate the complexities surrounding societal fascination with celebrity killings, paving the way for further investigation and dialogue on broader societal implications. Through an analysis of over 100 cases sourced from various open outlets, this research seeks to explore the underlying factors driving fascination with celebrity murder. Two central research questions guide this study: (R1) What diverse factors contribute to the allure of celebrity murder? (R2) How do these factors influence discourse and perceptions surrounding such incidents? The mystery and possible social repercussions of celebrity killings are increased by the ongoing media attention they receive.</p> <p>URL for poster: Click to view</p>
39	<p>Tick Gardens: Cultivating our Understanding of Blacklegged Tick (<i>Ixodes scapularis</i>) Behavior at the Forest-lawn interface <i>Sandra Zapata-Ramirez</i> with: Victoria Hornbostel</p> <p>Advisor: <i>Neeta Connally, Biology</i></p> <p>Blacklegged ticks (<i>Ixodes scapularis</i>) can cause Lyme disease in humans and pets, and are commonly found on residential properties that border forests. Therefore, many backyard Lyme disease prevention strategies focus upon managing ticks at forest edges. However, field evaluations of tick control tactics can be difficult due to high variability in natural tick abundance. To remove this variability, we created two types of tick-infested field enclosures ("tick gardens") to track tick movement at the forest-lawn interface. We were able to track tick emigration in both gardens and noted ticks crawling >1 m in both directions within enclosures (from lawn into forest, and from forest into lawn). In addition, up to 35% of recovered ticks moved from forest edges into maintained lawn spaces. These findings demonstrate the utility of tick gardens and underscore the need for management strategies that suppress tick movement in backyard landscapes that border forests.</p> <p>URL for poster: Click to view</p>

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