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May 5, 2023
The Bluffs and 3rd Floor Student Union

8:50 a.m. - 1:00 p.m.

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	Union 3120	Union 3130	Union 3310
8:50 to 9:15	**O.G.1** **Erin Brino (U)** ***Biology*** DNA Extraction Protocols for Formalin-Fixed Fish and Comparative Genetic Analyses of Disjunct Southern Brook Lamprey (*Ichthyomyzon gagei*) Populations	**O.U.2** **Katie Cox (U)** ***History*** Jewish Immigration to La Crosse, WI during Early 20th Century Russian Persecution	
9:20 to 9:45	**O.G.3** **Vanessa Czeszynski (G)** ***Biology*** Dissolved Organic Carbon Dynamics in Lakes and Streams in Northern Wisconsin		
9:55 to 10:20	**O.U.4** **Sasha Mader (G)** ***Recreation Management & Therapeutic Recreation*** From Exploration to Discovery: Increasing Accessibility to Leisure and Recreation Education	**O.G.5** **Sean Floersch (U)** ***Mathematics*** Machine Learning Madness: A Survey of Machine Learning Techniques on NCAA Men's Basketball Game Predictions	
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SCHEDULE OF ORAL PRESENTATIONS – page 2

	Union 3120	Union 3130	Union 3310
11:00 to 11:25	**O.F.8** **Michael Current (F)** ***Murphy Library*** Tracking Student Learning Outcome Engagement by Librarians at the Reference Desk		
11:30 to 11:55	**O.U.10** **Ryan Sperling (U)** ***Political Science & Public Administration*** Pursuing Platinum: An Analysis of Madison, WI Bike Policy through the Advocacy Coalition Framework		
12:05 to 12:30	**O.U.12** **Mikaela Schneider (U)** ***Sociology*** Estimations, Ambitions and Achievements: An Examination of Parental Factors and Their Effect on Students Educational Aspirations and Attainment	**O.U.13** **Jared Brinkman (U)** ***History*** Prohibition in La Crosse: Making a Thriving Industry Illegal	**O.U.14** **Ky Ariano (U)** ***Microbiology*** Determining the Functional Role of the GOX1969 Protein in *Gluconobacter oxydans*
12:35 to 1:00	**O.U.15** **Clara Hance (U)** ***Exercise & Sport Science*** Inclusion's Limits: Layshia Clarendon's Presence (or Lack Thereof) in the WNBA	**O.U.16** **Louden Ferguson (U)** ***Archaeological Studies*** Parts That Make a Hole: An Analysis of Usewear and Microwear on Oneota Lithic Drills	**O.U.17** **Emily Richards (U)** ***Microbiology*** Cytosolic Rap1b Promotes Megakaryocytic Apoptosis

UNDERGRADUATE STUDENT ABSTRACTS

UNDERGRADUATE POSTER PRESENTATION ABSTRACTS

Poster Session A
8:50 am – 9:45 am

A.U.1 Examination of *fimB* Point Mutations on *fimB* Transcription in Uropathogenic *Escherichia coli* Growing in an Acidic Environment

Jenna Blomquist
Co-authors: Shahina Sultana and William Schwan
Mentor: William Schwan, Microbiology

Most of the urinary tract infections worldwide are caused by uropathogenic *Escherichia coli* (UPEC). Type 1 pili helps UPEC attach to the epithelial cells of the human urinary tract. Several *fim* genes encode for proteins associated with type 1 pili production. One of those genes is *fimB*, which encodes the FimB protein that regulates the orientation of an invertible DNA element housing the transcriptional start site for the *fimA* structural gene. Human urine has a low pH and a high osmolarity environment, an environment that increases OmpR protein levels and repression of *fimB* transcription. To get a better understanding of how OmpR regulates the *fimB* gene, point mutations were made in the transcriptional start site of the *fimB* gene. These *fimB* point mutants were cloned onto an extrachromosomal plasmid and placed back into a UPEC isolate that has had its *fimB* gene deleted. The unmutated parent and *fimB* mutant strains as well as the *fimB* mutant with the plasmids containing different *fimB* point mutations were grown in Luria broth set at pH 5.5. Total RNA was isolated from each strain, converted to complementary DNA, and then analyzed by a polymerase chain technique to gauge differences in *fimB* transcription between the strains. Several point mutations led to changes in *fimB* transcription in the UPEC growing in an acidic environment. Through our analysis, we have a better understanding of how OmpR regulates *fimB* transcription in UPEC.

A.U.2 Metabolic Analysis of Freshwater Ecosystems Monitored by the National Ecological Observatory Network

Aly Reuvers
Mentor: Eric Strauss, Biology

Aquatic ecosystems' food web dynamics and trophic interactions can be indicated by the metabolic balance of energy consumption and production. Here we are calculating whole-system metabolism at 7 different lentic aquatic sites across the United States using data collected by the National Ecological Observatory Network (NEON). Changes in dissolved oxygen were measured at a frequency of approximately 5 minutes during July 2019 at each site: Crampton Lake (WI), Lake Barco (FL), Lake Suggs (FL), Little Rock Lake (WI), Prairie Lake (ND), Prairie Pothole (ND), and Toolik Lake (AK). Weather data and water quality measurements were used to account for photoperiod, oxygen saturation, and atmospheric diffusion. After taking account these factors, net ecosystem production (NEP), gross primary production (GPP), and total respiration (R) were calculated for each site. This study allows a comparison over time across locations and demonstrates aquatic system variability. Data from Myrick Marsh collected in summer 2022 was used as a local comparison as well. Finally, it provides a whole-system metabolic baseline that can be observed for changes over long time periods or after a drastic event.

A.U.3 Significance of *brpS* Gene Point Mutations on *srtA* Transcription and Biofilm Formation in *Staphylococcus aureus*

Sarah Fleegal
Co-authors: Allison Zank (Evergreen Innovations) and William Schwan
Mentor: William Schwan, Microbiology

Staphylococcus aureus causes hundreds of thousands of people each year in the United States to have skin/soft tissue, heart valve, and bloodstream infections. Many of these infections result in the formation of a biofilm by the bacteria, which makes treatment and resolution of the infection difficult. Previous work in the laboratory identified two genes that may be tied to biofilm formation in *S. aureus* labeled *brpR* (biofilm regulator protein regulator) and *brpS* (biofilm regulator protein sensor). Mutations in either of these genes caused the *S. aureus* cells to create more biofilm than the unmutated parent strain and an upregulation of *srtA* transcription. For this study, several point mutations were made in the *brpS* gene cloned onto an extrachromosomal plasmid that changed one amino acid to another amino acid within the protein. Each of these *brpS* point mutants was transferred to a *brpS* mutant strain of *S. aureus* and screened for the ability to form a biofilm

as well as transcribe the *srtA* gene. Several *brpS* point mutants displayed changes in biofilm formation and transcription of the *srtA* gene. This data suggests that the mutations in the brpS gene were critical for the ability of the BrpS protein to regulate transcription of the *srtA* gene and subsequent biofilm formation in *S. aureus*.

A.U.4 Viva Argentina: The Relationship Between Soccer and the Tango before the 1994 and 2022 World Cups in Argentina

Sean Floersch
Mentor: Rose Brougham, Global Cultures & Languages

The tango and soccer are connected historically in Argentina because of common multicultural origins and the cultural pride that surrounds these two cultural phenomena. The tango and soccer are recognized as cultural building blocks of Argentina, but a direct connection is often omitted in literature. This analysis develops ideas of how two tango songs represent the Argentinian National Soccer Team before the 1994 and 2022 World Cups, to add understanding of the cultural connection that exists between the tango and soccer in Argentina. Two tango-influenced songs are investigated to support this analysis: "Gol Argentino" by Edmundo Rivero (1994) and "Muchachos, Ahora Nos Volvimos a Ilusionar" by La Mosca Tse-Tse (2022), both written about the Argentinian national team before World Cup play. These songs have many similarities and differences, with these comparisons being seen through the lyrics, the rhythm, and instruments to represent the emotions, historical significances, and spectacle of the Argentina National Soccer team in World Cup play in 1994 and 2022.

A.U.5 Analyzing the Impact of Bottleneck Size on the Recovery of Influenza A Replication Capacity

Katie Manzeck
Co-author: Francesca Scala
Mentor: Peter Wilker, Microbiology

Influenza viruses cause annual epidemics and occasional pandemics throughout the world. About 11% of the U.S. population contracts the flu every year, resulting in hospitalizations and death. The influenza virus is a segmented negative-sense RNA virus. It contains eight RNA strands that each code for one or more viral proteins needed for attachment and proliferation in a host. One of these proteins is RNA-dependent RNA polymerase (RdRp) and it is needed to copy the RNA genome of the influenza virus. During transcription, RdRp has shown a high error rate due to a lack of proofreading ability. This results in the generation of mutations, creating a genetically related but distinct population of influenza viruses with a relatively high level of genetic diversity. Analyzing the causes and implications of this genetic diversity helps understand the ubiquity of influenza epidemics. A dilapidated virus generated as a product of prior research will be used to analyze two bottleneck conditions. The dilapidated virus was sequentially passaged in MDCK cells under two bottleneck sizes. The resulting viruses were used to compare replicative capacity following the bottleneck. Each virus is sequenced and after receiving the genome, we will look for inconsistencies that could correlate with varying degrees of fitness. Based on current data, new primers are being designed to account for currently unsuccessful sequencing. Once sequencing is complete, mutations will be evaluated.

A.U.6 Tango and Trauma in Buenos Aires

Ainsley Allan
Mentor: Rose Brougham, Global Cultures & Languages

This article explores the trauma of the dance and music of tango in Buenos Aires, Argentina from the mid to late 1900s. This analysis is predominantly based on the movie "Glorias del Tango" (2014) written by Oliver Kolker, and the influences that Tango has on the Natives of Buenos Aires. The main focus of this article is to discuss the main character, Fermín, and his experiences with tango, his family, and the resultant trauma. Based on the evidence in the film, Fermín suffers from post traumatic stress disorder (PTSD) because of his past family experience, his trauma, and the violence around the norms of tango. This includes Fermín neglecting his wife and children, his son dying at a very young age, the PTSD that developed because of that family loss, and the alley-way violent fights that he would partake in, outside of a tango bar. This information adds knowledge to the conversation of the impact and history of tango in Buenos Aires, other determinants of PTSD, and further, how these can be related to each other.

A.U.7 Images on the Skin: A Study on Why People Get Tattoos

Henry Anderson
Mentors: Elizabeth Peacock, Archaeology and Anthropology, and Sierra Rooney, Art

Throughout this paper, the main question that is going to be addressed is: why do people get tattooed? Why go through the process of having a needle dragged through your skin only for either an image, a collection of words, or something else to merely be for display? As this paper points to, the answer to this question lies beyond being something just to show off. The research done to answer these questions shows that tattoos help formulate one's own unique identity. In addition to this, the research displayed shows that since tattoos help create identity, artistic merit should be applied to all forms of tattooing. It is by the way of people viewing tattoos as an art form that they are able to create an image of themselves through the art of tattooing. Through the use of surveys and interviews, the formulation of identity through tattoos and the artistic importance of tattooing will be further investigated in the paper. Tattoos have been, and continue to be, a valid form of art, identity creation, and identity expression.

A.U.8 Disorders, Danger, and Decisions: The Interaction of Gender and Schizophrenia in the Courtroom

Alexis Ashe and Kathleen Casella
Mentor: Grace Deason, Psychology

Various factors influence juror's decisions and perceptions of a defendant within a criminal trial. Gender of a defendant and the presence of a diagnosis of schizophrenia have been shown to impact a juror's perception of a defendant and the decisions they make about a defendant. While these factors have been examined individually, they have seldom been examined together. As such, we aim to determine how jurors' ideas of defendants based on their gender and a diagnosis of schizophrenia impact the perceptions they have of these defendants and the decisions they make about them. To do this we will ask participants to read a scenario about a defendant found guilty of assault and answer questions about perceived dangerousness and suggested sentencing severity. We expect to find a relationship between schizophrenia and gender on juror's perceptions and decisions about defendants in the courtroom. These results could reveal how jurors make their decisions in the courtroom based on perceptions of a defendant with a schizophrenic diagnosis and the defendant's gender.

A.U.9 On the Bluff Edge: Predicting Risky Hiking Behavior in Hixon Forest

Megan Block, Katherine Kortenkamp, Sophia Heller, and Elijah Bliske
Co-authors: Lauren Roff, Ciara Haws, Cassidy Stanger, and Colleen Moore (Emerita, Montana State University and University of Wisconsin-Madison)
Mentor: Katherine Kortenkamp, Psychology

The purpose of this study was to understand factors that predict hikers' risky decisions. Hikers (N = 165) visiting a bluff overlook in Hixon Forest completed surveys about their behaviors on the bluff, and their beliefs about the dangers and effectiveness of different warning signs. How close hikers got to the bluff edge was predicted by their self-exempting beliefs, fear of heights, thrill-seeking, and age. Those who got closest to the edge said the signs would have kept them farther back. We hope results of this study can inform natural area managers and help keep hikers safer.

A.U.10 Using Historical Context to Evoke Emotion in Mario Benedetti's "Bandoneón"

Olivia Burich
Mentor: Rose Brougham, Global Cultures & Languages

This article explores the ways in which Mario Benedetti, a 20th century Uruguayan journalist, uses historical contexts of immigration and modernization from the late 1800s and early 1900s in his writing to influence the interpretation of his works. This article will analyze the poem titled, "Bandoneón," written between 1978-1979, which uses the historical and cultural values associated with the bandoneon, a musical instrument typically used in tango ensembles, to support the tone present in the poem. The bandoneon was chosen as the focus of this poem because of what it represents in Argentina and Uruguayan history and Benedetti utilizes personification and metaphor to bring the bandoneon to life in his writing. The role that the bandoneon plays in the birth of the tango is a representation of the passion that the lower class displayed in their movements through dance in response to the hardships that they were experiencing from their status in society. Benedetti evokes emotions of both pain and passion as he describes life as a bandoneon, with the highs and lows correlating with the movement of the instrument and the historical context associated with the instrument to support these

ideas. This investigation is important because it acknowledges the importance of the tango to Argentine and Uruguayan history and how it has a lasting influence in the works of artists and writers.

A.U.11 The Efficacy of Tripod Sign on Hamstring Tightness

Grace Conway
Co-author: Scott Doberstein
Mentor: Scott Doberstein, Exercise & Sport Science

Hamstring tightness is a common condition that can lead to lower back pain and decreased flexibility/mobility. One clinical evaluation test for the diagnosis of hamstring tightness is the Tripod Test (TT). The goal of this research project was to determine if the TT is a valid test for diagnosing hamstring tightness, and to determine if acute stretching would increase the patients' flexibility. There is very limited information currently about the TT and whether stretching can affect the test. Healthy subjects performed an initial TT followed by an acute fifteen-minute hamstring stretching session. We then repeated the TT to see if there were any changes in their hamstring tightness testing results. The results concluded that there were significant increases in hamstring flexibility after the acute stretching session related to a positive/negative pre vs post TT result. The significance of the findings showed acute stretching can improve hamstring tightness and the TT can diagnose obvious hamstring tightness. However, if the patient's goal is to improve their overall long term hamstring tightness, a more prolonged stretching regimen would need to be prescribed.

A.U.12 Optimal Timing of Caffeine Consumption Prior to Athletic Performance through a Variety of Anaerobic Exercises

Olivia Gartner, Manny Drexler, Ben Hersh, Kellie Hierl, Will Ideker, and MC Matthews
Mentor: Salvador Jaime, Exercise & Sport Science

Caffeine is a commonly used ergogenic aid in sports performance, with most of its effects coming from antagonizing adenosine receptors. This may improve synaptic communication, increase motor unit recruitment and firing rate, ultimately resulting in greater muscle force output. Although much data exists on the optimal timing of caffeine prior to aerobic exercise, not much research has shown its impact on anaerobic exercise. Purpose: This study seeks to determine if ingesting caffeine 5- or 30-minutes prior to anaerobic activity is more effective in enhancing anaerobic performance. Methods: This study will include subjects between the ages of 18 and 30 on various athletic teams. The first trial will be a familiarization day consisting of four anaerobic tests to mitigate the learning effect: Maximal Voluntary Contraction (MVC) grip test, vertical jump, change of direction/agility, and the Wingate stationary bike. The remaining three trials will be randomized influenced by the timing of caffeine ingestion (no caffeine, 5- and 30-minute prior). Sessions will be separated by at least 48 hours. Results and discussion: Data collection and analysis are ongoing.

A.U.13 Developing and Validating a Screening Protocol for Rat-Bite Fever (*Streptobacillus moniliformis*) in Thirteen-Lined Ground Squirrels (*Ictidomys tridecemlineatus*)

Grace Gehrke
Co-authors: Cord Brundage, Scott Cooper, William Schwan, Hannah Pamperin, and Daniela Prado
Mentor: Cord Brundage, Biology

Streptobacillus moniliformis is a gram-negative rod-shaped bacterium that causes a systemic inflammatory illness in humans commonly called "Rat-bite fever". *S. moniliformis* has been identified in wild rodents and other species as a zoonotic risk but is relatively uncommon in laboratory animals. Thirteen-lined ground squirrels (*Ictidomys tridecemlineatus*; TGS) are used regularly for biomedical and hibernation associated research. *S. moniliformis* has not been previously documented in wild or captive-bred TGS. In November 2020, six out of seventeen captive-bred TGS tested positive for *S. moniliformis* at the University of Wisconsin- La Crosse (UWL) animal research facility. Serial testing with an outside laboratory was cost prohibitive. To facilitate further testing and screening for *S. moniliformis* an in-house culture and polymerase chain reaction (PCR) protocol was developed using a control strain (B8900). Confirmation of *S. moniliformis* was made via 16S rRNA sequence analysis. Once confirmation was made of control strains, oropharyngeal samples were obtained from previously *S. moniliformis* positive and negative (control) animals. UWL continues to maintain *S. moniliformis* positive TGS. The development and validation of an in-house screening protocol provides a process by which additional widespread *S. moniliformis* testing of captive and wild-caught TGS can be performed to further characterize the prevalence of this zoonotic bacteria in ground squirrel populations.

A.U.14 Determining the Structure of an NtrC-like Response Regulator from *Myxococcus xanthus*

Vanessa Giallombardo
Co-author: Daniel Bretl
Mentor: Daniel Bretl, Microbiology

Myxococcus xanthus is a soil bacterium often used to study social behaviors and complex lifecycles. Multiple stages in this bacterium's lifecycle require responding to environmental signals using two component systems (TCS) to facilitate coordinated, multicellular motility known as social motility. Recently, NmpRSTU has been identified as one TCS that can regulate social motility in *M. xanthus*. In this system, NmpR is a response regulator protein that, in response to a certain environmental signal, turns "ON" and will cause expression of *pilA* and other genes. The gene *pilA* encodes a piece of the machinery required for social motility. Many mutant strains of NmpR have been identified for their ability to restore motility in a nonmotile strain of *M. xanthus* lacking a functional TCS that normally regulates *pilA* expression. The mutation locations on the NmpR protein from these strains and predicted protein structures provide some insight as to how this type of response regulator may function when turned from "OFF" to "ON". Yet, how response regulator structure changes in response to biochemical signaling is still being elucidated. Therefore, we are purifying $NmpR^{ON}$ variants with the intention of determining a crystal structure. A successful structure of one of these mutant NmpR proteins will further our understanding of how these response regulators flip from an "OFF" to "ON" state.

A.U.15 CDTA Conjecture

Nathaniel Green
Co-author: Edward Kim
Mentor: Edward Kim, Mathematics & Statistics

The CDTA conjecture is a statement about polynomials and matrix operations. (A matrix is a collection of numbers stored in the shape of a rectangle.) Using two matrices A and B, we consider a polynomial made from matrix operations. The conjecture asks if this polynomial is always positive. In 2021, a UWL team of researchers proved the CDTA conjecture for a special case and partially proved the conjecture for a more complex special case. Between these two special cases, a natural third special case was not considered due to the research methods used. My Professor, Dr. Kim and I have been working on this third special case over the past 10 months. Our recent work has concerned sorting "necklaces" into "buckets" in order to prove equality of two polynomials.

A.U.16 From Uncommon to Familiar: The Evolution of Language Teachers' Experiences during and beyond the COVID-19 Pandemic

Noelle Hackenmueller and Kimberly Morris
Mentor: Kimberly Morris, Global Cultures & Languages

The COVID-19 pandemic caused a monumental shift in the way we all live. One of the biggest challenges was the continuation of school systems during this unanticipated time. As a result, many methods of teaching and learning were implemented, many supported by technology. The pandemic has taken a toll on world language (WL) classrooms, which rely on social interaction for second language (L2) development. Although the transition to remote teaching was uncomfortable at first, WL teachers eventually began to embrace new classroom innovations. The goal of this project is to explore the evolution of WL teachers' experiences during the height of the pandemic (Spring 2021) versus now (Spring 2023). Because WL teachers' sense of efficacy changed during the pandemic, we will examine how their perspectives changed after the pandemic. Specifically, we will administer a survey in Spring 2023 to UWL WL teachers about their current classroom practices and then compare the results to a survey that was distributed in Spring 2021 among the same participants. Data will be collected and analyzed using Qualtrics, allowing comparison between the two surveys. We expect to observe shifts in instructor perspectives and potential implementation of new teaching methods as a result of the pandemic.

A.U.17 It Takes a Village to Tango: The Benefits of Dance-Based Communities for Under-Privileged High Schoolers as Seen in *Take the Lead*

Lexie Hile
Mentor: Rose Brougham, Global Cultures & Languages

As inner-city schools become more populated, it becomes more difficult to keep students on track, especially students who do not have much guidance from family and authorities in their lives. *Take the Lead* (2006), directed by Liz Freidlander, is based on the real story of the "Dancing Classrooms" project created by Pierre Dulaine. Played by Antonio Banderas, Mr. Dulaine uses his knowledge and expertise of tango and other ballroom dances to foster success in a group of troubled high school students in New York City. The specific question this article aims to answer is how exactly he accomplishes this. Essentially, Mr. Dulaine's teachings of tango and other ballroom dances offer the students many mental and emotional "tools" that help them navigate their lives during times when they lack guidance and connection. The three most significant tools this article covers are a sense of purpose, an escape from their troubled home lives, and an outlet for self-expression. *Take the Lead* and any research about the film and its origin may provoke new ideas about how to provide under-privileged inner city high schoolers with the resources they need to succeed in school and in life.

A.U.18 Sniff it Real Good: Is Ingestion Necessary to Reap the Benefits of Pre-workout?

Anthony Hoff, Ellie Broehm, Travis Haak, Amy Abegglen, Hannah Powers, and Sarah Fenn
Mentor: Salvador Jaime, Exercise & Sport Science

Individuals consume pre-workout powder to enhance their performance. Previous studies suggest that ingesting pre-workout aims to decrease the perception of muscle fatigue and increase time to exhaustion. Similarly, smelling salts may improve anaerobic power while in a fatigued state. However, these ergogenic aids may impose an unnecessary financial burden. Purpose: This study's objective is to determine if the smell of pre-workout is a strong enough stimulus to enhance exercise performance, compared to a fruity scented placebo and an odorless powder. Methods: 10 college-aged subjects, 5 men and 5 women, both of which are resistance trained and habitual users of pre-workout, will be recruited. Participants will undergo four trials, separated by about 4 days. Subjects will perform bench press for three sets to failure. The first visit will be familiarization to establish baseline values. The following three trials consist of smelling a randomized powder before each set of bench press to failure at 75%. After each set, participants will rate subjective variables including motivation, fatigue, and alertness. Results and discussion: Data collection and analysis is ongoing.

A.U.19 Phenology of Insect Abundance and Nesting Periods in Flammulated Owls (*Psiloscops flammeolus*) of Northern Utah

Chris Hoffman
Co-author: Paige Dunnum
Mentor: Markus Mika, Biology

The study of timing in natural systems is called phenology. Particularly in temperate regions with distinctive seasons, natural populations may try to synchronize their annual movements and breeding efforts based on the timing of available food and nesting resources. After returning from their wintering grounds in southern Mexico, insectivorous Flammulated Owls that breed in northern Utah tend to establish nests with the prospect of raising their offspring during peak abundance of nocturnal invertebrates. In recent years, reproductive output has varied extensively among different seasons, which may indicate a lack of adequate foraging opportunities. We created insect abundance curves over five breeding periods for Flammulated Owls estimated from data collected in Malaise insect traps across four canyons in Utah. Each curve consists of weekly rolling averages for insect abundance across all canyons for a single summer. The curves were then compared to peak nestling periods when parents are required to provision their young with the highest caloric value close to the time when young leave the nest. More successful nests may align more closely when insect abundance is most consistent.

A.U.20 The Tango in the 21st Century: Exploring the Boundaries of the Traditional Dance

Gretta Kraus
Mentor: Rose Brougham, Global Cultures & Languages

The concept of the tango and what it stands for has changed drastically over time. It has roots in Buenos Aires, Argentina with lower socioeconomic status, heterosexual men and women dominating the dance. However, in the 21st century, the tango has spread all over the world with every class, sexuality, and gender enjoying its rhythms and movements. One all-women tango company based in San Francisco has explored the traditional boundaries of the dance. Tango Con*Fusión is a group of eight women with varying backgrounds in dance. The documentary, titled by their name, Tango Con*Fusión, created by Auriel Auriel in 2004 features this company, their roots, and their goals. While deeply appreciating and building on the Argentine tango, they take it upon themselves to fuse multiple genres into their dance. In addition, the company defies the norms of heterosexuality that is so deeply rooted in the tango. Through interviews and performances, the director and dancers in the documentary, Tango Con*Fusión, challenge the traditional tango through a new take on gender roles, movements and theatrical shows.

A.U.21 Tango as a Subversive Activity

Emily Luhtala
Mentor: Rose Brougham, Global Cultures & Languages

I propose to explore how tango can be a subversive activity in the face of censorship in Argentina and Germany. “Adios Muchachos” (1927) is a tango song written by César Felipe Vedani, and its lyrics were censored during the Argentine military dictatorship in the 1940s, as the song contained words and phrases that belonged to lunfardo, the jargon of the criminals of Buenos Aires. Another example of the censorship of tango can be found in the book *The Tango Player* (1944) by Christoph Hein, which tells the story of German tango musician Peter-Hans Dallow who serves time in jail for his performance of “Adios Muchachos,” which was altered to contain subversive lyrics—lyrics that undermined the German government. When a form of expression is censored, it means that it carries a cultural and political significance. Such an expression is considered a threat to the government, which, thereby, makes the very act of that expression subversive. During the periods of censorship imposed by the Argentine and German governments, any participants in tango (musicians, dancers, and singers alike) were subversive and established resistance against their government, and this subversive power is exemplified by the tango song “Adios Muchachos” by César Felipe Vedani through its historical significance in Argentina and ramifications in the book *The Tango Player* by Christoph Hein.

A.U.22 Unconscious Bias or Trainable Attitudes? Training Implicit Biases That May Be Detected in the Implicit Association Test

Maiya Nate, Maggie Kaiser, and Katherine Osborne
Mentor: Alexander O'Brien, Psychology

Implicit Association Tests (IAT) intend to measure beliefs that people are unable to admit (Project Implicit). IAT architects acknowledge that results are only weakly correlated with measurable behaviors. The purpose of the current research was to determine whether a neutral implicit association could be trained into participants and subsequently be detected on an IAT. Participants were trained to associate negative words with angular shapes, and positive words with rounded shapes. Training sessions presented angular or rounded shapes, followed by positive or negative words. Participants press “correct” or “incorrect” buttons depending on the shape and word association. Then, participants were given an IAT to determine whether they showed an implicit preference for rounded shapes. After completing the IAT, trainees’ scores on the shape IAT will be analyzed using the standard X2 analyses to identify the presence and strength of implicit associations. Additionally, using a X2 test of independence, trainees’ IAT scores will be compared to scores of untrained participants who complete the same IAT. If results indicate that trainees exhibit these implicit associations at a greater extent than control participants, this will suggest that implicit associations detectable by IATs can be formed quickly, and with relatively few exposures. These findings hold implications for understanding implicit associations and contribute to conversations on developing bias awareness training.

A.U.23 Magnetic Moment of Deuteron Quark-Gluon Plasma

Ivan Ngian and Steven Verrall
Co-authors: Andy Otto, Emily Friederick, Isaac Ozolins, Spencer Sivertson, and Seth Schaffer
Mentor: Steven Verrall, Physics

A deuteron is a proton fused with a neutron. Recent deuteron quark-gluon plasma experiments indicate an hourglass structure. This project proposes that in a deuteron quark-gluon plasma, the quarks decouple from the Higgs field. The massless charge is then assumed to form two interacting oppositely-charged surfaces. The positively charged surface is an hourglass shell. The negatively charged surface is a torus shell wrapped around the hourglass neck. The structure's stability is assumed to be provided by electrostatic attraction balanced by magnetic repulsion. This implies that the strong interaction transforms into electromagnetic interaction. This proposed deuteron model extends a recently published proton model based on the circular Unruh effect, zitterbewegung effect, quantum electrodynamics, classical electromagnetism, and quantum chromodynamics. A magnetic moment, equaling that of a proton is assumed to be generated by each of the hourglass lobes. The neutron's magnetic moment is assumed to dissociate into two pieces. These are one hourglass lobe and a negatively charged torus. It will be shown that the deuteron's magnetic moment can be explained by minor misalignment of the hourglass relative to the torus. The amount of misalignment can be directly related to the deuteron's mass-energy distribution. This project involves algebra and calculus that undergraduate physics students can understand. The long-term goal is to apply this method to model larger nuclear structures.

A.U.24 Determining Habitat Preferences and Locations of *Achatina fulica* Infected by *Angiostrongylus cantonensis*

Ashton Osterhaus
Co-author: Eva Sundquist
Mentor: Jennifer Klein, Biology

Angiostrongylus cantonensis, or rat lungworm, is a parasite that has a significant presence in the state of Hawaii and throughout the Pacific Islands. In Hawaii, the intermediate host for this parasitic nematode is predominantly the Giant African Snail (*Achatina fulica*). Humans become infected with the third larval stage of rat lungworm when they eat these snails or ingest fruits, vegetables, or water that was exposed to Giant African Snails. Infections in humans are frequently accompanied by severe neurological symptoms and can occasionally result in death. The goal of this study is to examine the relative concentrations of Giant African Snails and predict what areas may be associated with higher infection rates. To do this, we will be observing the number of snails found per square meter in several locations throughout the island. In addition, we will be measuring the conditions in which the snails are found, including temperature, humidity, sunlight, elevation, soil moisture, and surrounding vegetation. This may grant a better understanding to the environments preferred by Giant African Snails and may give individuals an idea of where they are more likely to be infected so that they can take extra precautions.

A.U.25 *Boquitas Pintadas*: A Portrayal of Women's Sexuality in 1960s Argentina

Julianna Rakowski
Mentor: Rose Brougham, Global Cultures & Languages

The taboo of sex is ever present in Argentinian society, and conversation surrounding sex is generally stilted or silenced. This taboo is demonstrated in the movie *Boquitas Pintadas* (1974) directed by Leopoldo Torre Nilsson, and takes place in Argentina. The protagonist, Nené is manipulated into a sexual relationship with her boss due in part to her innocence and the power her boss had over her. Although the movie was produced in 1974, it was based on a book published in 1969, and as such there is some gender inequality present, especially related to women participating in sex outside of marriage. The 1960s was a time of change in Argentina- socially, culturally, and politically. The dynamics of families started to change. Women went from being expected to be virginal at marriage, to being more confident with their bodies and sexuality. This paper intends to discover how gender inequality and changing levels of education about sex contributed to Argentinian women having complicated relationships with their own sexuality, and specifically how this is portrayed through Nené.

A.U.26 Effects of Oxidized LDL on Platelets after Cold Storage or Hibernation

Alexis Ringhofer, MacKenzie Caya, Traeton Saint, and Rene Faun
Mentor: Scott Cooper, Biology

Human blood clotting cells called platelets cannot be stored in the cold, or they are rapidly cleared after a transfusion, while those from hibernating ground squirrels are resistant to cold storage. The CD36 receptor was found to be absent on squirrel platelets but present in humans. This receptor binds to oxidized LDL (bad cholesterol) signaling changes inside of the cell through proteins like extracellular signal-regulated kinase (ERK) causing apoptosis, or cell death in human platelets after being stored in the cold. We measured levels of oxidized LDL in squirrel plasma using an enzyme linked immunosorbant assay. Further, ground squirrel and human platelets were incubated with LDL and oxidized LDL and assayed for activation by binding to fluorescent fibrinogen and for apoptosis by annexin binding. There was not a significant amount of oxidized LDL in the squirrel platelet rich plasma samples within the ELISA assay. The measurements showed increased activation in the squirrel samples, suggesting that oxidized LDL can activate squirrel platelets even in the absence of CD36. The measurements also showed apoptosis with increased oxidized LDL, suggesting the oxidized LDL bound to another receptor for activation and apoptosis.

A.U.27 Assassination Tango: The Importance of Self-Discovery and Values

Amanda Salazar
Mentor: Rose Brougham, Global Cultures & Languages

African and European immigrants developed the original tango dance in 1880 Buenos Aires, Argentina, where they blended their cultural backgrounds together to create a brand new one. The intimate and sensual dance would soon be known worldwide inspiring works of literature, music, and now cinema. This article examines the incorporation of tango in the film *Assassination Tango* (2002) directed by Robert Duvall. Duvall stars in the film as a hitman, John J., sent on a mission in Buenos Aires that takes longer to complete than expected. While waiting to complete his mission, he observes the breath-taking Manuela, played by Luciana Pedraza, dancing and teaching tango. He soon becomes her newest student, and she introduces him to the way of life that is tango. Duvall's character realizes the hard and soft parts of himself through his learning of tango. This article analyzes the director's use of specific tango elements of dance, music, and historical background throughout the film that inspire a search for identity. *Assassination Tango* and any research it inspires teaches that tango is not just a dance, but one of the purest ways to discover one's true values in life.

A.U.28 Comparison of Two Post Activation Performance Enhancement Modalities on Vertical Jump Performance

Ethan Schultz, Kyla Johnson, Eryn Flynn, Kaylyn Field, Maddi Hall, and Samantha Steinbrenner-Dirr
Mentor: Salvador Jaime, Exercise & Sport Science

Human physical ability in sports performance has reached a plateau, leading to stagnating world records. Post activation performance enhancement is a promising method for increasing peak power output in athletes. By performing conditioning activities at maximal or near maximal intensity, an acute increase in explosive neuromuscular capacity is triggered. Purpose: Determine whether eccentric overload or isometric squats are the more effective stimulus to increase jump performance in athletes. Methods: This study includes 10 male and female subjects 18-23 years old. The first trial consists of familiarization, determining participants 1RM, and a baseline vertical jump test. The second and third trials consist of warm- ups, a loaded baseline vertical jump test and two sets of two eccentric overload (110% 1RM) or two 5-second isometric hold (120°) squats. Subjects then perform a loaded vertical jump test (20% 1RM) at 5, 6, and 7 minutes after the conditioning squats. The order of the sessions is randomized to avoid the order effect. Sessions are separated by at least 48 hours. Results and discussion: Data collection and analysis is ongoing.

A.U.29 Identifying the Significance of Tango in the Film *Frida*

Angela Sutter-Grajales
Mentor: Rose Brougham, Global Cultures & Languages

A look into the life and work of the Mexican artist Frida Kahlo is presented in the Julie Taymor produced film, *Frida*. One of the film's notable features is the deliberate inclusion of tango, an Argentine cultural product, which has raised questions about its significance and intended use. By examining the scenes where tango was portrayed, one can learn more about Frida's character as she is expressing passion, desire, and sensuality. These intense and emotionally tense

scenes perfectly capture the complicated and uneasy nature of Frida and Diego's relationship. The inclusion of tango in the film reflects the diversity and underscores the notion of Frida's life and work. It serves as a reminder that Frida's identity cannot be limited to a single cultural identity and that her art and life were shaped by a diverse range of influences. Finally, there is a scene towards the end of the movie where Frida is confined to a hospital bed and is visited by a group of friends who dance the tango for her. This scene captures Frida's resilience and spirit, even in physical and emotional pain.

A.U.30 Artistic Expression as a Means to Cope with Mental Illness as Depicted in the Film Fermín, *Glorias del Tango*

Maddy Vantassel
Mentor: Rose Brougham, Global Cultures & Languages

The film *Fermín, Glorias del Tango* (2014) directed by Oliver Kolker and Hernán Findling provides a powerful commentary on coping with and overcoming Post Traumatic Stress Disorder (PTSD) using artistic expression. Though their protagonist, Fermín, Kolker and Findling develop a character who suffers from an extreme case of PTSD. Wrought with painful memories of the past, Fermín is only able to communicate via the lyrics of tango songs. By providing an analysis of the lively tango culture in Buenos Aires, Argentina during the time period between 1945-1976, as well as highlighting the negative social attitude surrounding mental health disorders at this time, Kolker and Findling beg viewers to ask how it is possible for Fermín to overcome his severe PTSD with the help of his deep-rooted connections to tango culture. Tango is at the heart of his trauma and is also what allows him to eventually find respite from his PTSD. A one-size-fits-all approach for treating severe mental health disorders does not exist, but there is ample evidence to suggest that artistic expression and engagement can be a protective and even a healing factor for those experiencing mental health disorders. It is important to consider how art can help those in need of strategies to manage their mental health as Fermín's psychiatrist demonstrates in the film. Art is a powerful tool that can help people overcome their mental health conditions through the emotional outlet that artistic expression provides.

A.U.31 From Lover to Killer: Pablo Neruda's "Tango del Viudo"

Emily Wolfgram
Mentor: Rose Brougham, Global Cultures & Languages

Even though Pablo Neruda refers to the Argentine tango in the title of his poem, "Tango del viudo" there is no other mention of it in the text. Instead, the poem describes a frustrated lover who left his love out of fear that he would be killed. Where is the tango in a poem that depicts how terrified and confused the poetic voice is? How can a person want to kill their love because of unbearable jealousy, and how does that affect a relationship? Some experts explain Neruda's use of tango through his writings, but scholars do not examine the connection between love and desire in "Tango de viudo". The theme, images, elements, and actions of the characters demonstrate how love leads to jealousy, and then jealousy leads to unthinkable actions that transform a lover into a murderer. This research examines the connection between love, jealousy, and human desire related to relationships and the feelings associated with tango.

A.U.32 Can Short-term Habituation of a Novel Task Improve Metabolic Efficiency?

Abigail Wyro, Sandy Bune, Morgan Harrison, Paytyn Mayotte, Jacob Pyykkonen, and Tyler Wohlfiel
Mentor: Salvador Jaime, Exercise & Sport Science

Novice movement skills involve less efficient motor unit recruitment than adept skills, resulting in excessive energy expenditure. With practice, we may become more metabolically efficient at performing skills. Leg length, and therefore cadence, may potentially play a significant factor in the degree of change in metabolic cost of learning a novice skill. Purpose: This study aims to determine whether walking backwards requires greater energy expenditure compared to walking forwards. Additionally, whether consecutive days of walking backwards will mitigate the potential augment in energy expenditure from walking backwards. Furthermore, whether there are correlations found in metabolic cost and leg length. Methods: This study will include 8 subjects, 18-25 years old and evenly distributed genders with varying leg lengths. Subjects will walk forwards and backwards while attached to a metabolic cart to measure energy expenditure. Following baseline measures, participants will walk for 5 sessions of 15 minutes backwards, with 2 rest days, over an 8-day period. Baseline measures will be repeated. Results and discussion: Data collection and analysis is ongoing.

Poster Session B
9:55 am-10:50 am

B.U.1 Unsaturated Short-Chain Fatty Acids (uSCFAs) Altering Epstein-Barr Virus Reactivation

Brice Durocher
Mentor: Kelly Gorres, Chemistry & Biochemistry

Epstein Barr Virus (EBV) is the origin of mononucleosis, a factor in oncogenesis, and most recently has been linked to the onset of multiple sclerosis. 95% of humans will have a chronic latent EBV infection at some point in their lifetime. EBV encodes for a series of genes responsible for a switch activating its lytic state from its latent state. Targeting this switch is important for keeping the virus from reactivating. Sodium butyrate (NaB) activates the switch. We have observed that SCFAs, propionate, and valerate, also induce EBV, but not as potently. However, branched medium-chain fatty acids such as valproate and valpromide inhibit Burkitt lymphoma cells. Research into SCFAs of this system has been limited to saturated SCFAs. The purpose of this study was to investigate how EBV reactivation was altered by uSCFAs. These uSCFAs are often found as metabolites in many plant systems, and found in herbal medicines. The effects of a few uSCFAs on EBV were measured both with NaB and without. Relative to a negative control, it was observed that low millimolar 3-methyl crotonic acid showed no initial change to the viral early-gene products. However, when the cells were treated with 3-methyl crotonic acid and NaB, we saw no induction as observed when NaB is introduced individually, which means 3-methylcrotonic acid inhibits EBV reactivation by NaB. Discovering regulators of EBV will aim to prevent the spread and development of clinical solutions for EBV-related diseases.

B.U.2 A Search for the Structural Identity of a Gammaherpes Virus Tegument Protein of Unknown Function: Advancements Towards the Understanding of Epstein-Barr Virus (EBV)

Damon Trump
Mentor: Kelly Gorres, Chemistry & Biochemistry

Epstein Barr Virus (EBV) and Kaposi sarcoma-associated herpes virus (KSHV) are members of the gammaherpes virus family. These viruses have been directly associated with multiple types of cancers in humans, particularly in Burkitt lymphoma, lung, and gastric cancers for EBV and a variety of immune cell cancers for KSHV. Herpes virions contain a tegument layer with protein functionalities and structures that are relatively unknown. We are particularly interested in a tegument protein of unknown function which has been linked to the lytic cycle in virus progression. This open reading frame is highly conserved among gammaherpesviruses, including the related virus, murine gammaherpesvirus 68 (MHV68). We have produced and purified the MHV68 target protein from E. coli. Disulfide bond and oxidation-reduction characteristics were observed in gel mobility shifts. Structural determination will allow us to advance our knowledge in the functionalities of this protein through structural relationships. This advancement will ultimately further our understanding of EBV and its role in human cancers and infections.

B.U.3 Effect of Copper on SK-03-92 Treated Yeast Cells

Taryn Lang
Mentor: Anne Galbraith, Biology

Antimicrobials are agents used to control the spread and growth of pathogens, but these harmful organisms have the ability to adapt and gain resistance to these molecules. Resistance to antimicrobials is a threat to public health, and it is essential to develop new drugs to fight this problem. Researchers at the University of Wisconsin-La Crosse and Milwaukee have taken a step toward developing a new antimicrobial SK-03-92. SK-03-92 has been shown in our lab to arrest the growth of 99% of the single-celled fungus Saccharomyces cerevisiae (yeast) in as little as 10 minutes. Previous work in the lab suggested that copper homeostasis could be disrupted in treated yeast cells. In this work, a known copper chelator was used to determine if it could ameliorate the effects of SK-03-92 treatment of yeast cells. Minimum inhibitory concentration assays using SK-03-92, copper sulfate, and/or the copper chelator were used to find a concentration range to test on wild-type yeast cells via our standard spot assay. Copper homeostasis mutants were also tested. Results from these experiments will be presented.

B.U.4 How Melatonin Affects Yeast Survival after Treatment with Antimicrobial SK-03-92

Hailey Willner
Mentor: Anne Galbraith, Biology

Through the use of ethnobotanical research, scientists from the Universities of Wisconsin - La Crosse and Milwaukee have collaborated to patent a compound referred to as SK-03-92, an antimicrobial derived from a naturally occurring compound purified from *Comptonia peregrina* (sweet fern). SK-03-92 stops the growth of 99% of yeast cells in as little as 10 minutes. An RNA-seq analysis of SK-03-92 treated yeast cells was performed, which resulted in the discovery of many families of dysregulated genes. One specific gene of interest, *CLN1*, is a cyclin gene that is involved in the G1/S phase of the cell cycle. RT-qPCR was performed to confirm the dysregulation of *CLN1* in response to SK-03-92 treatment. Previous work indicated that ROS is produced in cells treated with SK-03-92, which may be impacting the cell cycle. To continue this research, we tested whether the antioxidant melatonin would ameliorate the effects of SK-03-92 on yeast cells. Results of these experiments will be presented.

B.U.5 Assessing a Mindfulness-Based Intervention on Smartphone Use

Jaden Stanelle
Mentor: Ryan McKelley, Psychology

Ninety-seven percent of adults own smartphones, and a 2020 survey by Stanford University found that college students are averaging 12 hours a day across devices. Despite benefits such as giving us the ability to stay connected to families or find information, research is mounting on the physical and mental health costs associated with excessive screen use. At the same time, mindfulness and meditation are becoming important tools to improve wellness and wellbeing. Mindfulness meditation shows promise to help students reduce automatic or habitual screen use. This study will assess the impact of a mindfulness intervention on participants' screen use. At Time 1, participants reported on their screen time for the previous week and completed the Mindfulness Attention Awareness Scale and the Absent-Mindedness Smartphone Use Questionnaire. The experimental group completed a meditation protocol involving 12 minutes of meditation, five days a week for four weeks. At Time 2, participants repeated the questionnaires, and the waitlist control group completed the same intervention. At the completion of the study, participants completed the measures for a third time. Analysis of variance and repeated measures ANOVA will be used to assess group differences between and across time. It is anticipated that the mindfulness intervention will result in decreased screen use and improve participants' mindful phone use.

B.U.6 The Effect of Intermittent Fasting Windows on Ground Reaction Force (GRF), Rate of Fatigue and Perception of Fatigue.

Makenna Carpenter, Caden Boettcher, Jared Dvorak, Hank Dwyer, Hannah Kufalk, and Adeline Walton
Mentor: Salvador Jaime, Exercise & Sport Science

Intermittent fasting is a common dietary practice utilized worldwide for cultural, religious, and health purposes. Previous research has shown that altering the timing of caloric intake can impact the regular circadian rhythm of food intake. However, current research conflicts whether intermittent fasting will inhibit or improve exercise performance. Purpose: To investigate the effects of intermittent fasting windows (sleep vs. awake) on ground reaction force (GRF), rate of fatigue, and perception of fatigue. Methods: This study will include 10 participants (18-23 years) and consist of 3 visits. Prior to testing sessions, participants will complete a non-fasted familiarization visit for descriptives and baseline data, consisting of hunger, satiety, and fatigue surveys, followed by a standardized warm up. Participants will complete an isometric squat test to measure maximal GRF, and a Wingate (30-s all-out cycling) test, with surveys administered after each test. This procedure will be repeated for the two intermittent fasting sessions. The first intermittent fasting window (sleep) will be from approximately 11:00 p.m.-7:00 a.m., and the second (awake) from approximately 7:00 a.m.-3:00 p.m. Results and discussion: Data collection and analysis is ongoing.

B.U.7 Incorporating Future Climate Scenarios into Climate Matching as Part of Invasive Species Horizon Scanning

Charlie Faude
Co-authors: Richard Erickson (USGS) and Danelle Larson (USGS)
Mentors: Richard Erickson (USGS) and Danelle Larson (USGS)

Invasive species cause massive ecological and economic damage. Natural resource managers seek to prevent the arrival of these species and understand invasion conditions. As part of this, scientists conduct horizon scanning exercises including climate matching models comparing native ranges to possible invasion ranges. We compared the use of future versus current climates for climate matching. We found including future climates scenarios allow resource managers to better plan for the future.

B.U.8 Passive Calf Stretching Protects Flow Mediated Vasodilation in the Popliteal Artery after Treadmill Exercise

Sarah Fenn
Co-authors: Lukas Bekkedal and Jacob Caldwell
Mentor: Jacob Caldwell, Exercise & Sport Science

The purpose of this study was to examine the effect of passive stretching on popliteal artery endothelial function after exercise. We hypothesized that intermittent passive stretching would maintain vasodilatory capacity of the popliteal artery after 30 minutes of treadmill exercise. 13 subjects completed 1 lab visit and underwent pre and post exercise flow-mediated vasodilation (FMD) tests to assess local vascular function. Immediately after pretesting, subjects performed intermittent passive calf stretching; 5-minutes "on", 5-minutes "off", repeated 4 times. Six subjects were part of the sham group, minimal stretch, while seven subjects performed passive stretching to moderate discomfort. Stretching was performed by having participants place their foot in a splinting device to ensure constant tension. Following the stretching protocol, participants completed a $\dot{V}O_2$ peak test to calculate 60% peak oxygen uptake. The participants thereafter completed 30-minutes of treadmill exercise at 60% $\dot{V}O_2$ peak. Doppler ultrasound was utilized during FMD test to analyze percent vasodilation of the popliteal artery. After stretching, stretch group showed no significant reduction in %FMD after 30-minutes of exercise (1.41±1.19%), whereas sham group showed a significant reduction (4.45±1.57%; $p < 0.05$). The current results indicate that intermittent passive stretching may help protect macrovascular dilatory function after 30 minutes of moderate-intensity exercise.

B.U.9 Can Neurodiversity Determine Stress Levels?

Ashley Furlan
Mentor: Katherine Kortenkamp, Psychology

Stress is a ubiquitous phenomenon that can cause a variety of symptoms and thought processes. Here, the impact of stress was evaluated for individuals with attention deficit hyperactivity disorder (ADHD), ADHD and comorbidities, and neurotypicals. People with ADHD have ongoing patterns of attention problems resulting in spacing out consistently, hyper impulsiveness, and a possibility of having both occur in a very short time period. People in the comorbidity category have a different diagnosis but may show similar stress levels and symptoms to people with ADHD . Prior research has indicated that people with ADHD have a greater likelihood of experiencing traumatic events and having self-diagnosed PTSD (Luderer, 2020), which could contribute to elevated stress levels among this population. In this study, college student participants completed an online survey that included validated questionnaires measuring general stress, interpersonal stress, and ADHD symptoms. Comorbidities were also assessed. Analyses will test my hypothesis that people with ADHD alone and with comorbidities, experience stress at a higher level than neurotypicals. This research can improve understanding of ADHD and how to help better accommodate people with ADHD.

B.U.10 Supervised Injection Sites (SIS): A Response to the Drug Epidemic in America

Matthew Gast
Mentor: Regina Goodnow, Political Science & Public Administration

Previous anti-drug programs were created in the late Twentieth Century and focused on preventing drug use during adolescence. However, there have been increased rates of opioid use and opioid related deaths throughout the United States. According to the CDC, opioid misuse has led to a significant increase in opioid-related deaths and continues to

worsen with the development of new synthetic-opioids. Comparable countries have utilized a new approach; supervised injection sites (SIS). The United States, however, only has two sites, both located in New York City. How can the establishment of a SIS benefit American suburban communities in America? By looking at peers abroad and domestically, the benefits and challenges of an SIS can be identified. This paper analyzes the history, political challenges, public opinions, and cost savings of supervised injection sites across the globe, specifically Insite in Canada and OnPoint in New York City. With drug use on the rise and La Crosse having one of the highest rates of opioid overdose related deaths and opioid related hospital visits in the Western region of Wisconsin, there is a need for the La Crosse community to establish a SIS. This SIS will not only save lives of drug users, but promote public health of the greater community, and provide costs savings in the governmental response to the opioid crisis that affects every community in America.

B.U.11 Association between Jump Height, Relative Propulsive Net Impulse, and Peak Propulsive Force Asymmetry during a Counter-Movement Jump in Soccer Athletes

Katie Hall
Co-authors: Colin Kleffman and Gaelen Young
Mentors: Thomas Kernozek, Health Professions, and Andrew Jagim (Mayo Clinic Health System)

Explosive power and limb symmetry relate to elite athletic performance. The purpose was to examine the relationship between jump height, relative propulsive net impulse, and peak propulsive force asymmetry during a counter-movement jump (CMJ). Thirty female NCAA Division III soccer athletes performed three CMJs on two force plates sampling vertical ground reaction force at 1000 Hz. Athletes utilized an arm swing and reached a knee angle of ~ 90°. Pearson product moment correlations were performed between jump height, relative propulsive net impulse, and peak propulsive force asymmetry using four different methods: absolute difference (AD), symmetry angle (SA), limb symmetry index (LSI), and percent asymmetry (PA). As shown previously, relative propulsive net impulse was directly related to jump height ($r = 0.997$). Symmetry measures using AD, LSI, and PA methods had a moderate relationship to jump height ($r = 0.412 – 0.415$). The SA method was least related to jump height ($r = 0.314$). Approximately 17% of the variation in jump height explains symmetry measures in peak propulsive force. Greater asymmetry during the propulsive impulse phase reduces jump height. Strength and conditioning professionals should consider bilateral training for soccer athletes to establish greater symmetry due to its effect on power performance.

B.U.12 Observation of Tadpoles in Response to Constant Ethanol Exposure

Cole Hawkins
Mentor: Cord Brundage, Biology

Sudden Infant Death Syndrome, commonly known as SIDS, is a product of constant ethanol exposure in early development. Along with SIDS, constant ethanol exposure has been linked to hyperactivity and a decrease in executive functioning seen in Fetal Alcohol Syndrome. This research study was conducted with bullfrog tadpoles to see if constant ethanol exposure led to an overall decrease in surfacing events, or times when tadpoles went to the surface of the air to breathe. Along with that, fifteen-minute videos were produced for each tadpole of each group, control and experimental. The videos were used for a behavioral comparison between the two groups, analyzing total activity (distance per minute and time moving per minute) and the average velocity. The variables were analyzed through the software program EthoWatcher. The research was conducted with two groups. The first was a control group that had no exposure to any drug or chemical for a consecutive ten-week period. The second group was the experimental group of tadpoles exposed to ethanol for ten consecutive weeks like the control group. The results of this study are still ongoing and the results of the data will be available soon. However, the data and results will be used to help reinforce potential links between sudden infant death syndrome (SIDS) and constant ethanol exposure during prenatal development. Also, reinforcements to cognitive deficits and disabilities may be found with the results of this study.

B.U.13 Using the Big Five Personality Factors to Investigate Academic Resilience

Jackson Jahnke
Mentor: Katherine Kortenkamp, Psychology

Many college level students struggle to find motivation when faced with academic hardship. Academic hardship has been linked to psychological problems such as depression, anxiety, and other stress-related disorders. For such a severe issue, a surprisingly small amount of research delves into further understanding what types of students are more likely to experience academic hardship and respond with resilience. For the current project, college students responded to an online

survey including a validated measure of the Big 5 personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism). They also reported their college GPA and completed the Academic Resilience Scale. Analyses will examine the correlation between the Big 5 personality traits, academic performance, and resilience. If a correlation is identified, the findings of the research might prove useful in identifying students who might struggle with academic resilience so that more resources and attention can be allocated to these individuals.

B.U.14 Comparing Historic Artifacts from Two Archaeological Sites on the Red Cliff Indian Reservation, Gaa-Miskwaabikaang

Faith Kalvig
Mentor: Heather Walder, Archaeology & Anthropology

My research took place in Red Cliff, Wisconsin, as part of Gete Anishinaabe Izichigewin Collaborative Archaeology Project (GAICAP), a community-based effort that brings archaeology under the control of local Ojibwe people. Under the direction of the Red Cliff Tribal Historic Preservation Officer, Marvin DeFoe and professional archaeologists, I conducted field and laboratory research during summer 2022. In doing this I compared glass, metal, and ceramic artifacts from two roughly contemporary late 19th and early 20th century archaeological sites on tribally owned lands: Frog Bay Tribal National Park and the Old Pageant Grounds. This research has identified differences in the kind of artifacts present at these two historic sites and helped determine what each area was used for within the community. Outcomes included narrowing time-frame of usage and identifying specific objects and their purposes. All of this is done in the interest and at the request of the Red Cliff community to increase their knowledge of their sites in order to better protect them.

B.U.15 Investigating the Lipid-Binding Properties and Structural Requirements of DcrB, a Salmonella Copper Resistance Protein

Josie Lammers
Mentor: John May, Chemistry & Biochemistry

We are investigating how Salmonella enterica resists toxic amounts of copper, which may allow it to survive the high copper concentrations used by mammalian immune systems to defend against pathogens. For this reason, proteins involved in copper resistance are potential targets for the development of new antibiotics. We are focusing on the protein DcrB, which has been shown to be required for Salmonella to survive toxic amounts of copper. Similar proteins have been shown to bind lipids, raising the question of whether DcrB has this ability too. Previous work has also shown that the region connecting the structured region of DcrB to the membrane is unstructured, raising the question of its necessity for function. To test whether DcrB binds lipids, it was exposed to lipids and its stability to heating was measured to see if they were bound. DcrB crystals were also formed in the presence of lipids and analyzed by x-ray diffraction to determine if the lipids were bound in the resulting structure. Lipids were identified that changed the melting temperature of DcrB but have not yet been observed bound in the structure. To test whether the unstructured region is necessary for function, we made variants of DcrB using genetic techniques and tested whether they were functional by measuring the growth of bacteria containing them in the presence of copper. Our studies may provide insight into DcrB's requirements for function and how Salmonella uses it to resist toxic amounts of copper.

B.U.16 Food and Mood: Does Diet Affect the Mental Health of College Students?

Elizabeth Eggers and Karen Skemp
Mentor: Karen Skemp, Public Health & Community Health Education

According to the Healthy Minds Study, more than 60% of college students meet the criteria for at least one mental health problem. Further, research shows a strong link between the gut and the central nervous system through a bidirectional pathway called the gut-brain axis. The gut microbiome plays a crucial role in human health, and when it is in dysbiosis, an imbalance of the microbiota, it has been associated with many physical and mental illnesses. Gut dysbiosis is mainly caused by three different factors: stress, diet, and antibiotic use. The purpose of this study is to determine if food intake, as well as perceived stress, is associated with the mood and mental health of college students. This study will survey college students about their stress levels and diet, two factors contributing to gut dysbiosis, and then survey their perceived mental health ratings to understand the gut's correlation to mental health. This study will use the Depression, Anxiety and Stress Scale (DASS) to assess the mental health of college students, the Rate Your Plate survey to assess the diet of the college students and the Brief Resilience Survey (BRS) to assess their stress levels. Surveys will be administered via Qualtrics.

B.U.17 The Relationship Between Variations of the Reactive Strength Index

Cole Letter
Co-authors: Ward Dobbs and Thomas Gus Almonroeder (Trine University)
Mentors: Ward Dobbs, Exercise and Sport Science, and Thomas Gus Almonroeder (Trine University)

The reactive strength index (RSI) is a metric used to evaluate an athlete's ability to utilize the stretch shortening cycle for force development. The RSI is traditionally calculated as the ratio between flight time and ground contact time during drop jump performance. However, a modified version (mRSI) has been developed for evaluating countermovement jump performance. The mRSI is calculated by dividing jump contraction time by flight time. Purpose: The purpose of this study was to examine the relationship between the RSI and mRSI metrics. Methods: 136 adolescent athletes participated in this study (86 males, 50 females). All athletes performed drop jumps where they dropped from a 30-cm box, landed, and jumped for maximal height, and countermovement jumps where they started in a standing position, initiated a rapid countermovement, and jumped for maximal height. Force plates recorded ground reaction force data throughout the movements. Pearson product-moment correlation was used to examine the relationship between the RSI and mRSI metrics. Results: There was a moderate, positive relationship between the RSI and mRSI metrics ($r = 0.60$). Conclusion: While the variations of the RSI are related, they do not appear to be interchangeable, suggesting that they assess slightly different aspects of performance.

B.U.18 Bacterial Variation in the Commensal Microbiome of PER Deficient *Drosophila melanogaster* Fruit Flies

Brenna Lundgren
Mentor: Alder Yu, Biology

The commensal gut microbiome in humans and other animals is vital to the metabolic health of the organism due to nutrients and other chemicals provided by the bacteria that are necessary for growth and development. In mammals, variation in bacterial abundance in the microbiome has been observed throughout the day that are influenced by feeding patterns. However, this pattern is not established in the insect commensal microbiome. Similar impacts on growth and development have been observed in fruit flies that have been shown in other animals. For instance, flies missing key players in their microbiome exhibit developmental delays and metabolic irregularities which were reversed when the flies were supplemented with the missing bacteria. However, the cyclic variation in bacterial abundance and the cause of variation, if present, has not been established in the flies. Using purified DNA samples, this project aims to contribute to ongoing research by my faculty advisor establishing the bacterial abundance in the fly microbiome and researching its cause. Samples will be collected from the pupae of flies that are deficient in the protein PER, which regulates circadian rhythm. If the variation in the microbiome is caused by the circadian clock and not in feeding rhythms, no variation will be found in the PER-0 flies but it will be seen in wild type flies with functional PER proteins.

B.U.19 Antimicrobial Activity of Plants Used in Traditional Hawaiian Medicine

Samantha Lyons
Mentors: Daniel Bretl, Microbiology and Jennifer Klein, Biology

This experiment was designed to be a field experiment performed in Hawaii to test plants for antimicrobial resistance. Antibiotics are substances that kill or inhibit the growth and spread of bacteria. As antimicrobial resistance increases so do the demand for new drugs. Throughout history, traditional medicine has included the use of plant parts to prevent and cure infections.

B.U.20 Don't Let Food Packaging Fool You: The Influence of Food Packaging Nutrient Claims on Perceptions of Healthiness

Amber Markowiak
Mentors: Katherine Kortenkamp and Bianca Basten, Psychology

With a growing public interest in developing a healthy diet, there has been more focus on what type of food products we deem healthy to consume. This project examined how nutrient content claims framed on the front of food packages influence consumer perceptions and decision-making, as well as how these perceptions may differ with age. Framing theory and how it is used in marketing has been studied, but there is still more to learn about the extent to which nutrient content claims are influential to consumer decisions and food perceptions. The specific nutrient claims studied in this

project are the labels of organic, sugar-free, and reduced fat. Participants completed an online survey that included twelve pairs of pictures of the same food product (side-by-side), one with a nutrient claim on the packaging and one without. Upon viewing these pictures, participants responded to two questions, asking them which product they would choose to purchase and to rate the healthiness of each product. Participants saw all the same food products, but in a randomized order. Data analysis will test the hypotheses that products with nutrient claims will be viewed as healthier and organic products will be preferred to non-organic.

B.U.21 Changes in Anaerobic Fitness across a Division III Wrestling Season

Micah Missall
Co-authors: Makenna Carpenter, Adrinna Marquardt, Anna Jacobson, Rachel Schmitt, Austin Westra, Daniel Freidenreich, and Ward Dobbs
Mentors: Ward Dobbs and Daniel Freidenreich, Exercise & Sport Science

Wrestling is a sport that requires maintenance of a high level of anaerobic fitness throughout the competitive season. Purpose: The purpose of this study was to monitor anaerobic fitness in Division III collegiate wrestlers throughout the competitive season. Methods: Ten male Division III wrestlers participated in this study [mean (SD)] [age, 19.7 (1.4) years; height, 180.8 (5.6) cm; mass, 84.2 (17.8) kg]. Once prior to the season, and at four additional timepoints, participants completed a Wingate test on a cycle ergometer that involved pedaling as fast as possible against a load equal to 8.2% of their respective weight class for 30 seconds. The average power (W) was recorded to represent anaerobic fitness. A repeated measures analysis of variance using polynomial planned contrasts was used to evaluate change across time. Results: Average power was significantly different across the season (P=0.007) and there were significant quadradic relationships (P=0.001) showing an initial decline followed by an increase in anaerobic fitness. Conclusion: Results suggest there was a notable decline in anaerobic fitness through the beginning of the season and further research should be directed toward addressing the attenuation in anaerobic fitness through the first half of the season.

B.U.22 La Crosse Area Employment Study

Emma Moore
Co-author: Sara Monday
Mentor: Daniel Plunkett, Recreation Management & Therapeutic Recreation

The purpose of this study is to gather information on factors affecting employment in the La Crosse region, including those that may affect your decision to relocate for a job, stay at your current place of employment, and/or considerations for leaving in the near future.
For our data collection we are targeting the hospitality and recreation industries. These have been identified as key sectors in the La Crosse region. The desired outcome of this study is to give employers and city officials a better understanding of how they can support the La Crosse workforce through workplace changes or retention of good practices.

B.U.23 Charge Radius and Mass Distribution of the Deuteron Quark-Gluon Plasma

Andrew Otto and Steven Verrall
Co-authors: Ivan Ngian, Isaac Ozolins, Emily Friederick, Seth Schaffer, and Spencer Sivertson
Mentor: Steven Verrall, Physics

Contemporary nuclear models do not explain mass distributions inside atomic nuclei. Established particle physics is unable to precisely calculate fundamental particle masses. Precise calculations of nuclear charge radii have been difficult to obtain using established nuclear models. A deuteron is a proton fused with a neutron. This project assumes that deuteron decoherence into a quark-gluon plasma involves the quarks and gluons losing their identities and merging together. It also assumes that decoherence involves charge completely dissociating from mass. A novel approach to calculating a deuteron quark-gluon plasma's charge radius and mass distribution is developed. The plasma is modeled as two interacting oppositely charged surfaces involving a positive hourglass-shaped shell and negative torus shell surface wrapped around the hourglass neck. The hourglass shell is assumed to be inflated by standing waves of virtual photons explained by quantum electrodynamics. A curious relationship between muon mass and the deuteron's torus shell mass is used as a starting assumption. This proposed deuteron model is an extension of a recently published proton model based on the circular Unruh effect, zitterbewegung effect, quantum electrodynamics, classical electromagnetism, and quantum chromodynamics. The long-term goal is to apply this method to modeling larger nuclear structures.

B.U.24 The Effect of Lu-177 Pluvicto Therapy Treatments on PSA Levels

Kaitlyn Neefe and Stacey Schmitz
Mentors: Stacey Schmitz, Carlyn Johnson (Marshfield Clinic Health System) and Angela Weiler (Rochester Mayo)

Pluvicto is a radiopharmaceutical that targets and kills prostate cancer cells using radiation. Pluvicto therapy has been shown to decrease prostate specific antigen (PSA) levels by 50% in 46% of patients. The purpose of this study was to determine the percent change between pre-treatment and subsequent PSA values in patients undergoing Pluvicto therapy at Marshfield Medical Center. This study examined 15 patients receiving 1-6 Pluvicto therapy treatments. Of these, 6 patients expired or withdrew prior to completing the therapy course, and only 2 patients had received all 6 doses. PSA levels obtained prior to each treatment were analyzed to determine the percent change between pre-treatment and each subsequent dose, along with the overall PSA change for all patients in the study. A separate overall percent was also calculated removing the 6 patients that did not complete the therapy. This study indicated that MMC achieved a $\geq$ 50% PSA decrease in 33% of the patients undergoing Pluvicto therapy rather than the 46% stated in the Pluvicto efficacy information, most likely due to the small number of study participants. With 6 patients needing to be removed from the study, it is likely that this treatment option was presented to them too late. Therefore, introducing this therapy to patients earlier may be the key to overall better outcomes.

B.U.25 Pathways of Creativity: How Does Creativity Predict Depressive Symptoms?

Coral Neubauer
Mentor: Katherine Kortenkamp, Psychology

Depression is a mood disorder that has become an increasingly important topic. Symptoms of depression affect the ability to function in everyday life, so understanding this condition and factors predicting depression are incredibly important. Previous research has explored the relationship between creativity and depression but has found conflicting results. Creativity connects to the development of self-confidence and problem-solving skills that play a role in resilience. Creative endeavors can also increase mindfulness in individuals which has been found to mediate depressive symptoms. However, research has also found a mediational relationship between creativity, rumination, and depression, where there is a positive correlation between all three variables. I completed an online research study to examine the relationship between creativity, mindfulness, rumination, and depression. Participants completed a survey containing validated scales measuring these constructs. I hypothesized adults who participate in creative activities that are positively linked to mindfulness will experience fewer symptoms of depression than adults who participate in creative activities positively associated with rumination. This research could be useful for understanding how behavioral creativity could be used as a possible treatment for depressive symptoms.

B.U.26 Disease Management in Captive Thirteen-Lined Ground Squirrels (*Ictidomys tridecemlineatus*)

Hannah Pamperin
Mentors: Cord Brundage, Biology, and William Schwan, Microbiology

Streptobacillus moniliformis is a gram-negative, rod-shaped bacteria that causes rat bite fever, a zoonotic disease. In the La Crosse area, populations of thirteen-lined ground squirrels (*Ictidomys tridecemlineatu*) naturally became infected with *Streptobacillus moniliformis*. This is an unusual finding since as the name indicates, this disease is typically carried in rats. This research project aims to create a diagnostic assay for *Streptobacillus moniliformis* to appropriately diagnose and treat these squirrels so we can minimize potential health risks to local human populations. We will make this criterion using polymerase chain reaction (PCR) and gel electrophoresis with oral samples from infected ground squirrels captured from the La Crosse area. For our control, we isolated DNA from a pure culture of *Streptobacillus moniliformis* using an EdgeBio PCR purification kit. We will isolate DNA from the oral swabs using a Roche High Pure PCR Template Preparation Kit.

B.U.27 Iron Age Scotland: Understanding the Dissimilar Functions of Ferrous and Nonferrous Metalwork

Sidney Paulson
Mentors: Constance Arzigian and David Anderson, Archaeology & Anthropology

The Iron Age has traditionally been understood as a time of great technological and social upheaval, defined by widespread warfare. This image of Iron Age civilization masks the diversity of the many cultures that lived during this time, and broad areas are often generalized in terms of what their culture may have been like. It is also commonly accepted that iron became the favored material for metalworking, over nonferrous metals such as bronze. Great Britain during the Iron Age has fallen prey to these generalizations and this paper uses archaeological material of metal artifacts from Britain and Scotland to shed some light on the differences between the material culture in these areas. While the Iron Age begins around 700 BC in both Britain and Scotland, it ends around 50 AD in Britain but persists until 800 AD in Scotland. Based on what is currently known about the Iron Age in Scotland, it is expected that my analysis will demonstrate that decorative metal artifacts were made from nonferrous metals while most iron artifacts were tools, not weapons. This would demonstrate that the Scottish Iron Age was less warlike than is typically portrayed.

B.U.28 Comparing High Intensity Resistance Training to Blood Flow Restriction and Their Effects on Fatigue Using the Y Balance Test and 5-10-5 Agility Test

Charlie Ravanelli, Brandon Murphy, Brandon Norton, Lauren Freeck, and Santana Seifert
Mentor: Salvador Jaime, Exercise & Sport Science

Athletic injury rates and fatigue have a direct association. However, due to inconsistencies with fatigue protocols, debate is ongoing whether fatigue impacting the nervous system vs the peripheral tissue is more sensitive to injury rates. Purpose: Our study compares central fatigue with the completion of high-intensity resistance training and peripheral fatigue with completion of blood flow restriction (BFR) and their effects on balance by incorporating the Y Balance Test (YBT) and 5-10-5 agility test (AT). Methods: This study includes 10-15 participants aged 18-23 years old in a crossover design. Our first trial consists of a baseline test for the YBT and the AT and a one-repetition max test (1RM). The second trial will be a repeat of the baseline test with the addition of either a heavy load back squat of 5 sets for 3-4 reps at 90% 1RM or 4 sets of 30-15-15-15 at 20% 1RM with BFR set at 350 mmHg occlusion. The participants will reverse roles for their third trial after 4-7 days of recovery. Results and discussion: Data collection and analysis is ongoing.

B.U.29 You Say "Potato", *Je Disais "Pomme de Terre"*: A Comparative Analysis of Organic Farming Practices and Attitudes in the United States and France

Jonathan Robinson
Mentors: Elizabeth Peacock, Archaeology & Anthropology, and Anna Keefe, Global Cultures & Languages

This project followed an examination of the cultural and practical differences between organic farms and markets in the Midwest region of the United States and the French region of Normandy. This examination was undertaken in response to growing concerns around the globe about unsustainable consumption practices and alternative food-ways - like organic products - becoming increasingly popular. Although the understanding and reasoning of organic farming and the consumption of organic products may appear to be ubiquitous, through the data collection methods of surveying, interviewing, and participant observation, my research shows that it is not. As will be presented in this paper, the organic food cultures of the Midwest United States and France are altered and formed along the intersectionalities of eating in the modern era. These intersectionalities operate as metaphorical lighthouses which buyers and producers of organic foods use in order to guide their perceptions of what organic foods are, and how they engage with the "organic" culture as a whole.

B.U.30 Characterizing Suppressor Mutants in *ΔpilRΔnmpR* Strains of *Myxococcus xanthus*

Allison Ronk
Co-author: Daniel Bretl
Mentor: Daniel Bretl, Microbiology

Myxococcus xanthus is an environmental bacterium that has a complex social lifestyle, which includes predation and fruiting body formation. These behaviors require motility and the ability to sense and respond to the environment using

two component signaling systems (TCS). A prototypical TCS contains a sensor kinase (SK) and a cytoplasmic response regulator (RR) that interact through a cellular response facilitated by the phosphorylation of the RR by the SK. If *pilR*, a RR, is deleted from the *M. xanthus* genome, the bacteria is non-motile. However, mutations arose in this strain in a different RR (named *nmpR*) that restored motility. We predicted these mutations either 1) increase the likelihood of NmpR being phosphorylated, 2) decrease NmpR dephosphorylation, or 3) mimic the NmpR phosphorylated state. To test these possibilities, *M. xanthus* Δ*pilR*Δ*nmpR* strains were complemented with $nmpR^{ON}$ mutant constructs or $nmpR^{ON}$ constructs that also contain a known mutation that prevents the protein from being phosphorylated (D54A). Motility assays are currently being performed to see which mutation or combination of mutations restore motility, but results to date suggest that most of the originally identified mutations are sufficient to restore motility. In other words, these NmpR variants do not need phosphorylation to be active. The knowledge gained about these mutations will have broad implications for the structure/function of other RR, due to the high conservation of NmpR with other RR.

B.U.31 Body Positivity as Promotional Strategy

Emily Wolfgram
Co-author: Kaia Johnson
Mentor: Nese Nasif, Marketing

The third wave of the body-positive movement began about a decade ago. Its primary purpose: confront the unrealistic expectations toward and unrepresentative bodies of women in popular media and advertising. This has led to the rebranding of many notable multinational companies, including expanding their size offerings. In the United States, consumer preference trends have led to an uptick in purchasing athleisure and sportswear apparel, and many companies in these industries have been forced to reevaluate their own product strategies in order to avoid being perceived as a non-inclusive brand. The purpose of this research, generally, is to investigate the potential effect of the body-positive movement on a particular part of the integrated marketing communications strategies of a sample of brands in the United States. We created a framework that delineates brands in our sample as being or not being proactively body-positive, and using this framework, we conducted case-based analyses to explore any potential correlations between being body-positive and gaining earned publicity.

B.U.32 Drunk and Afraid: How Does Alcohol Use Relate to College Student Fear Levels?

Cassidy Schreiner
Mentor: Katherine Kortenkamp, Psychology

College is a time where many students are taking their first steps toward living independently and trying many new activities. With this comes experimentation with alcohol. Research has shown that alcohol use in college is correlated with a number of different, often negative, outcomes. However, research has not explored whether college students' drinking behaviors predict their levels of fear of becoming victims of crimes. This project assesses participants alcohol intake and how that correlates with levels of fear across a variety of situations, including theft, sexual harassment and assault, verbal assault, physical assault, and homicide. College student participants complete an online survey containing the Alcohol Use Disorders Identification Test to assess their alcohol intake. Following this are questions related to the above situations in which participants will rate their fears of victimization on a scale from 1-10. Responses will be analyzed to determine if alcohol use predicts more or less fear of victimization in each situation and whether these relationships vary with gender of the participant.

B.U.33 Portrayal of Dementia and Memory Loss in Children's Literature

Katie Thomas
Co-author: Erica Srinivasan
Mentor: Erica Srinivasan, Psychology

The number of people living with dementia globally is estimated to be 55.2 million people. Out of those 55.2 million people, more than 7 million people have been diagnosed dementia in the United States. This has a large impact on the people surrounding those with dementia, including children. Explaining dementia to children can be difficult and challenging. One helpful tool, however, are children's books on dementia. Studies indicate that children's books have the potential to shape children's ideas and understanding of illness, promote positive relationships, and validate children's feelings, however little research has been conducted on the messages in children's books on dementia. As the number of people diagnosed with dementia continues to increase, there is a growing need to communicate with young children about

dementia and the changes it can bring to family life. In this study, we analyzed children's books on dementia, identifying ways in which dementia was depicted and how it might shape children's understanding of dementia.

B.U.34 Solubilization of a Cancer-Associated Herpesvirus Protein

Owen Thompson
Mentor: Kelly Gorres, Chemistry & Biochemistry

Kaposi's sarcoma-associated herpesvirus is known to cause cancers, specifically Kaposi's sarcoma and primary effusion lymphoma. KSHV establishes itself in the host for a life-long infection. KSHV remains latent in most infected individuals but can become reactivated and destroy host cells. KSHV ORF48 is one protein linked to lytic activation and viral replication. We want to study the ORF48 protein by producing and purifying it in the lab. KSHV ORF48 was successfully produced using Escherichia coli. However, the protein that has been produced is not soluble. Soluble protein is desired as it makes protein easier to purify, an essential step in the process of structure determination. The use of the lysis agent BugBuster for inclusion body purification allowed for some solubility and pure ORF48. A new technique involving a fusion protein is also being tested, to see if it will aid in the solubility of KSHV ORF48. Soluble KSHV ORF48 is essential for further purification of the protein, and thus structural and kinetic studies. This allows us to better understand the function of the viral protein.

B.U.35 "Am I the Drama?": An Examination of Friendship Dissolution within College Students

Taylor Trost
Mentor: Michael Tollefson, Communication Studies

The purpose of this study is to explore how college aged students conceptualize and undergo friendship dissolution. The proposed study will include anyone attending college who has experienced friendship dissolution while attending university. Participants will participate in face-to-face or online zoom, semi-structured interviews. Since much of the previous research on this topic has been conducted studying general friendship dissolution, interviews about communicating friendship dissolution may yield new insight. This research will begin upon IRB approval and will extend until May 9th, 2023. Data was collected throughout use of semi-structured interviews taking approximately thirty minutes to an hour. The intended population includes anyone who has experienced friendship dissolution while attending college. The researcher anticipates 12 to 15 participants, with an expected age range of 18-23, however, students attending university outside of that age range are also encouraged to participate.

B.U.36 Analyzing Effects of Intra-Set Foam Rolling on Critical Power in Resistance Training Adults

Lauren Vosters, Ethan Budnik, Austin Denotter, Colin Kipper, and Max Norris
Co-author: Sarah Hulstedt
Mentor: Salvador Jaime, Exercise & Sport Science

Data supports that exogenous pressure on the endothelium cells, due to foam rolling (FR), causes the release of nitric oxide (NO). Increased levels of NO results in vasodilation of the blood vessels, which may improve the blood flow to the muscle. This may benefit workload at critical power (CP), which is the tolerable duration of severe intensity exercise. CP is viewed as the relationship between fatigue and exercise performance. Purpose: The purpose of this study is to examine the effects of intra-set FR on critical power and fatigue in resistance training adults. Methods: Healthy male (n=6) and female (n=6) subjects with no prior leg injuries visited the laboratory on three separate occasions. During the first visit, familiarization tests revolving around performance testing, FR techniques and overall study operations were conducted. For visits 2 and 3, participants were assessed on leg extensions, performing as many repetitions as possible (AMRAP). After performing AMRAP, a coin flip determined whether subjects followed FR treatment or seated rest (CON). Results and Discussion: Data collection and analysis is ongoing.

B.U.37 Positional Spending in the NFL and Its Impact on Winning

Dillon Koestler
Mentor: Douglass Baumann, Mathematics & Statistics

Winning is of the utmost importance for teams in the National Football League. Success is often measured by wins in the regular season, playoffs, and Super Bowl. Spending funds wisely on players is one way NFL franchises attempt to create

high and sustainable levels of success year after year. This research examines the relationship between the amount of money spent at each position group on a professional football team and winning over the past ten seasons. This research sought answers to the questions about the most valuable positions in football, teams that have spent resources well in the past and benefitted from it, and what team has structured its spending the best for the upcoming 2023-2024 season. Statistical analysis was conducted using R programming to create linear models, graphics, and distance metrics among other methods. The purpose of this project was to better understand and inform spending decisions and team-building strategies to increase the chances of a team's success.

B.U.38 Investigating the Characteristics and Energy Sources for Bacteria from the Gut Microbiome of La Crosse County Aquatic Slugs

Anne Wood
Mentor: Bonnie Bratina, Microbiology

Aquatic and terrestrial slugs are important environmental indicators that reflect ecosystem health. In this experiment, we isolated bacteria from the gut microbiome of these creatures. Our goal was to learn more about the nutritional requirements of microbial species inhabiting this niche. To investigate this, we cultured biome samples on pectin plates, brain heart infusion agar plates, and inulin plates in both aerobic and anaerobic conditions. We found a variety of gram-negative and gram-positive bacteria with the ability to grow on these media, indicating that a diverse gut microbiome exists in the slugs which may contribute to their feeding adaptability.

B.U.39 Structural Dynamics of a Hemolytic Protein

Cassie Zehr and Katelyn Phelps
Mentor: Daniel Grilley, Chemistry & Biochemistry

A common technique utilized by pathogenic bacteria to infect hosts is the secretion of cytotoxic proteins, which break open host cells, exposing the bacteria to all nutrients stored within. Proteus mirabilis, a gram-negative bacteria commonly associated with UTIs, uses this very technique, secreting hemolysin A (HpmA) to infect hosts. Secretion of HpmA requires a second component, HpmB, located on the outer membrane of the cell. In this two-partner secretion pathway, HpmB couples the folding and transport of HpmA, allowing HpmA to achieve its folded and active form upon secretion. The proposed mechanism for this involves a Brownian Ratchet model, in which all energy for transport is derived from random motion of the protein within its environment. It is hypothesized that HpmA is sequentially folded as it passes through HpmB, and that the folded segments serve as a mechanical stop, thus, ratcheting the protein down, preventing movement back into the cell. The β-helical structure of HpmA is characterized by circuits consisting of approximately 21 amino acids. To test if full circuits represent the mechanical stops, we have created a series of truncated variants that differ in length by a few amino acids. Using CD-monitored denaturation experiments and functional experiments, we show that there are potential pause points of increased stability. Results of these experiments will be discussed in the context of the Brownian Ratchet secretion model.

Poster Session C
11:00 am-11:55 am

C.U.1 Impact of Disrupted Circadian Rhythms on Blood Glucose Levels in *Drosophila melanogaster* with Modeled Type II Diabetes

Edith Ben-Eboh
Mentor: Alder Yu, Biology

Type II diabetes(T2D) occurs when the body cells have built resistance to insulin, secreted by the pancreas to control how much blood sugar is taken into cells for energy expenditure. With the rise in T2D, it has become crucial to understand how it can be managed, especially with no available cure. *Drosophila melanogaster* is a model organism frequently used for studying T2D as they are metabolically similar to humans. Circadian rhythms are the natural cycle of biological, physical, and behavioral changes in organisms consistent over 24 hours and important for regulating important metabolic activities. This means that odd work schedules and other activities that affect the quality and quantity of sleep may put an individual at increased risk for metabolic diseases like T2D. My research investigates the effect of circadian rhythm disruption on fasting blood glucose levels of *Drosophila melanogaster* that have been placed on high-sugar diets. I will

use a circadian rhythm disruption that closely models the schedule followed by human shift workers. My disruption schedule deviates from the normal (12:12) light: dark (LD) cycle to an alternating (6:12:6)/ (12:12) DLD/ LD cycle. The findings from my summer research suggested that flies on high sugar diets had more circadian rhythm disruption than flies on a normal diet, and that the disruption schedule was successful in disrupting their normal activity. I hypothesize that fasting blood glucose levels will be elevated for flies with disrupted circadian rhythms.

C.U.2 Temporal and Spatial Patterns of Aquatic Insect Emergence in Pool 8 of the Upper Mississippi River

Samuel Flaig and Aaron Murphy
Mentor: Ross Vander Vorste, Biology

Aquatic insects are a diverse group of organisms that are essential components to aquatic and terrestrial food webs. Aquatic insects transition from their aquatic larval forms to their terrestrial adult forms, a process referred to as emergence. Recent evidence suggests the emergence of aquatic insect populations such as mayflies is in decline. Emergence events can be highly variable over a given temporal and spatial scale. Gaining knowledge about temporal variability may grow understanding food web interactions. Understanding spatial variability may identify habitat areas that promote emergence, informing protection efforts. We collected aquatic insects over three intervals at 27 locations in Pool 8 of the Upper Mississippi River summer of 2022. Insects were collected using traps comprised of dishes coated with insect glue. Insects from orders Ephemeroptera, Plecoptera, Trichoptera, and Odonata were identified to the family level. Preliminary results suggest that peak emergence of Ephemeroptera was in early July and consisted primarily of Ephemeridae (*Hexagenia*). Plecoptera occurred in low abundances. Trichoptera, mainly Hydropsychidae and Leptpceridae, were the most abundant and diverse order. Odonata consisted primarily of Coenagrionidae and were widespread. Overall, strong temporal or spatial patterns in insect emergence were not seen, further sample processing that includes samples from more sites could strengthen patterns.

C.U.3 Investigating the Roles of Two Evolutionarily Conserved Stress Pathways in the Response of *Caenorhabditis elegans* to the Novel Anthelmintic, CL-5

Jeanna Kedrowski
Co-author: Jennifer Miskowski
Mentor: Jennifer Miskowski, Biology

Parasitic worms infect plants, livestock, and humans, and anthelmintics are drugs to combat these infections. The development of drug resistance to available anthelmintics is well-documented with significant health risks. The compound CL-5 was derived from a parent chemical from the plant *Comptonia peregrina* (sweet fern). CL-5 was found to possess novel anthelmintic properties using the model nonparasitic worms, *Caenorhabditis elegans. C. elegans* exposed to CL-5 become paralyzed and die, and their progeny die or exhibit developmental delays. Previous work has shown CL-5 to cause elevated oxidative stress. The two major stress response mechanisms in *C. elegans* are evolutionarily conserved in higher organisms, including humans, and both rely on changes in gene expression mediated by a transcription factor: DAF-16/FOXO or SKN-1/Nrf. Experiments have suggested that a DAF-16 pathway is triggered in CL-5 treated animals since the DAF-16 protein becomes nuclear localized in response to CL-5 and *daf-16* mutants are hypersensitive to CL-5. Recent studies involve using qRT-PCR to measure gene expression of known DAF-16 targets in CL-5 treated worms, and early results support the activation of the DAF-16 pathway. Current work seeks to determine if the SKN-1 pathway also functions in the response of *C. elegans* to CL-5 by testing worm strains with modified SKN-1 activity and qRT-PCR of SKN-1 targets. Findings will help elucidate the molecular mechanism by which CL-5 kills *C. elegans.*

C.U.4 Display of Amylases on the Surface of *Gluconobacter* to Enable Starch Utilization

Abby Lewis
Mentor: Paul Schweiger, Microbiology

Acetic acid bacteria is an industrially important group of organism because of their unique metabolism, in which they incompletely oxidize sugars rather than completely oxidize them to water and CO_2. Products produced by these organisms include acetic acid, cellulose and vitamin C among other things. Industrial products are currently produced from simple sugars (e.g. glucose). This is because acetic acid bacteria can only be grown on media that is high in sugars, such as glucose, and is incapable of growth on complex carbohydrates. The proposed project aims to engineer the model acetic acid bacteria, *Gluconobacter oxydans* (*G. oxydans*), to be able to use the complex carbohydrate starch for growth and industrial production. To this end, I will create a library of 24 unique plasmids that contain genes to optimize the

growth of *G. oxydans* on a medium containing starch. Starch is an abundant agricultural waste product and is more cost effective than glucose, so starch degrading strains are expected to make products created by *G. oxydans* cheaper.

C.U.5 An Interregional Analysis of Scandinavian Pre-Roman to Roman Iron Age Ceramics

Ilariah McAnally
Mentor: Timothy McAndrews, Archaeology & Anthropology

During the peak of the Roman Iron Age, the site of Sorte Muld in Bornholm, Denmark was a thriving settlement that flourished on agriculture, livestock, and oceanic trade with the Roman Empire and Gothic groups of Northern Europe. These trade connections highly influenced the customs and material culture of the occupants of Sorte Muld. What remains of Sorte Muld is buried below a wheat field with the looming threat of agricultural activity disturbing the cultural context of this spectacular site. While Sorte Muld is famous for its *gulgubbes* (hammered gold foil images depicting men, women, animals, and other unidentifiable figures), the ceramics at the site are much more abundant and can tell us about the function and lifestyles of the settlement. After analyzing and determining the typology of 64 ceramic sherds, the site can be placed between the Pre-Roman to Roman Iron Age. However, I am taking an additional step in comparing my finds to datasets from the sites of Uppåkra in Lund, Sweden and Gudme-Lundeborg in Funen, Denmark to determine if the Sorte Muld area of excavation was primarily domestic or ceremonial. I hypothesize that by utilizing the ceramic typologies and completing an interregional analysis, I can help determine the function of the Scandinavian Iron Age Sorte Muld settlement.

C.U.6 External and Internal Workload Demands of the Northern Warfare Challenge: A Pilot Study

Makenna Carpenter
Co-authors: Adrinna Marquardt, Anna Jacobson, Rachel Schmitt, Andrew Jagim (Mayo Clinic Health System), Joel Leudke (Mayo Clinic Health System), and Thomas Gus Almonroeder (Trine University)
Mentor: Ward Dobbs, Exercise & Sport Science

Purpose: The purpose of this study was to quantify the internal and external workload demands of the Northern Warfare Challenge (NWC) in relation to regimented physical training (PT) sessions. Methods: Eight male Reserve Officers' Training Corp (ROTC) cadets [mean (SD)] [age, 20.8 (1.1) years; height, 177.5 (8.7) cm; mass, 77.8 (7.3) kg] participated in this observational study. Participants were equipped with a physical activity monitor and wore it throughout the duration of the NWC, and during PT sessions, which monitored reflective of internal (e.g., heart rate and breathing rate) and external workload (e.g., accelerometry through g forces), respectively. Descriptive statistics of the training sessions were computed to show the relative demand of the NWC in comparison to a typical PT session. Results: The average internal and external workload was greater for the NWC (2952.9 ± 440.3 au; 240 ± 47 g) than the PT sessions (290.2 ± 62.2 au; 142.2 ± 36.4 g), respectively. The duration of the NWC was approximately 7 times longer than PT sessions. Conclusion: The longer duration of the NWC compared to PT sessions significantly increased the internal and external workload recorded by the cadets.

C.U.7 Apparel Company Contributions to Sustainable Development Goals (SGDs)

Cora Barrett
Co-authors: Graham Netten, Dana Moore, and Anna Statz
Mentor: Christine Ascencio, Management

This project aims to identify efforts of four different companies within the apparel sector to enhance contributions to Sustainable Development Goals (SDGs). Results are reported on WikiRate, a platform for making company data accessible, comparable, and open. Data is analyzed in terms of contribution to SDGs, which are 17 global goals for a better world in 2030. The private sector has been identified as an important contributor to these goals; however, the actual contributions by corporations have been varied. To compare the four companies, 4 of the 17 SDGs (5, 8, 7, & 12) are assessed. Data on the metrics is found in the company's annual environmental, social, governance (ESG) report. To compute metrics, both quantitative and qualitative methods are used. These metrics are compared across companies and to benchmarks set to achieve SDGs. Findings that support or undermine company contributions to the SDGs will help identify best practices and areas for improvement for corporate contributions towards the SDGs and reporting standards.

C.U.8 Cultural Dissonance Felt by Multiracial/Multiethnic Students at a Predominantly White Campus

Sophia Beckwith
Mentor: Elizabeth Peacock, Archaeology & Anthropology

The lives and experiences of multiracial/multiethnic individuals within society is difficult for many to comprehend, and this can be seen significantly in the environment of a predominantly white institution, where identity is questioned by anyone, but specifically multiracial/multiethnic students. This research examines not only how this particular group of students feel at the University of Wisconsin La Crosse, but also how this environment might impact their sense of self. In this research, multiracial/multiethnic students were interviewed, surveyed and observed to investigate their experiences on and around campus and the barriers they may face throughout their time on campus. The findings that came from these interviews and other data shed light on the fact that multiracial/multiethnic students at UW-La Crosse in particular feel this sense of dread when it comes to identity because they do not fit into a certain category and feel as though they need a better way to find community on campus. These results demonstrate a need to evaluate what these students need in order to feel whole and represented, and what the campus could do to help them find a sense of community more easily.

C.U.9 Passive Stretching as a Method to Increase Muscle Oxidative Capacity and Lower Arterial Stiffness in Peripheral Arterial Disease

Lukas Bekkedal and Sarah Fenn
Co-authors: Jacob Caldwell, Maxwell Walker, Salvador Jaime, and Daniel Freidenreich
Mentor: Jacob Caldwell, Exercise & Sport Science

Passive stretching has been shown to improve shear stress that may act to protect exercise induced vasodilation. Unfortunately, no studies show how muscle microvasculature is impacted after stretch. This study investigated repeated passive muscle calf stretching and its effect on microvascular responsiveness after treadmill exercise. We hypothesized that passive stretching would improve microvascular responsiveness after treadmill exercise and be impaired in the control group. 18 males and females underwent a single lab visit to assess repeated passive stretching on the microvascular responsiveness. Passive stretching was performed with a splint device placed on each foot for a 5-minute constant stretch, 5-minutes of relaxation, and repeated 4 times. Microvascular responsiveness was measured during three vascular occlusion tests (VOT). Measurements consisted of a VOT pre-stretch, VOT post-stretch, and a VOT post-treadmill exercise. Participants were placed in the sham-control or passive stretching group. After stretching, 60% peak oxygen uptake was calculated using a treadmill test. Next, 30-minutes of treadmill exercise was performed at 60% VO2 peak. Near Infrared Spectroscopy was placed on the lateral head of the gastrocnemius throughout testing. This investigation suggests that in healthy, college aged individuals, passive stretching does not suggest improved microvascular responsiveness although clinical populations may show different responses.

C.U.10 A Rollercoaster of Emotions: How Non-dancers Interpret Emotions Communicated through Dance Performances

Bri Beining
Mentor: Michael Tollefson, Communication Studies

The purpose of this research project is to develop a deeper understanding of the nonverbal, communicative art form of dance, and the ways it can be used to communicate emotions to nondancers. The sensemaking theory will examine ways in which dance is able to be interpreted and understood without using any form of verbal communication contributing to the understanding of how people make sense of the nonverbal actions they see. The participants will participate in a 30-60 minute interview either in-person or over zoom which will ask a few questions about how the participant felt after viewing four different short video clips of a dancer. This research will begin upon IRB approval and will extend until May 19th, 2023.

C.U.11 Associations between Video Game Use and Psychological Attributes and Attitudes

Sabrina Binns
Mentor: Grace Deason, Psychology

Video games and characteristics of people who play them continue to be topics of interest in psychological and behavioral research. Prior research has found associations between video game usage and conformity to masculine stereotypes and

sexist perceptions of women. Additionally, past research has identified associations between addictive gaming and experiences of detachment and anxiety in social situations. This study builds on prior research and attempts to analyze the relationships between time spent playing video games and levels of social avoidance and distress and gender stereotype endorsement. Undergraduate students recruited from the UWL Psychology Department participant pool will respond to a survey listed in SONA containing an original video game questionnaire, the OAT-AM trait subscale to measure participants' levels of gender stereotype endorsement, and the social avoidance and distress scale (SADS) to measure participants' experiences of social anxiety and avoidance. Specifically, I hypothesize that undergraduate students who spend more time playing video games will report higher levels of social avoidance and distress than those who spend less time playing. Additionally, I hypothesize a positive association between time spent playing video games and stereotype endorsement among men and a negative association between time spent playing video games and stereotype endorsement among women.

C.U.12 Effects of SK-03-92 Treatment on Yeast Vacuole Morphology

Brianna Bores
Mentor: Anne Galbraith, Biology

In the fight against antimicrobial resistance, scientists at UWL have been studying a new antimicrobial, SK-03-92, that was derived from a compound found in a plant known commonly as the sweet fern. The SK-03-92 drug has been found to kill both bacteria and Saccharomyces cerevisiae (a fungal yeast). A large-scale RNA-seq analysis was done on wild-type yeast cells treated with SK-03-92 to determine genes that were dysregulated in response to that treatment. One gene shown to be dysregulated was CLB1 which encodes a cyclin. qPCR confirmed this dysregulation. In an attempt to determine why the cell cycle might be impacted by SK-03-92 treatment, we pursued an investigation of previously observed morphological changes in the vacuole after SK-03-92 treatment. A vacuole-specific fluorescent stain was used on both wild-type strains and strains with known mutations in vacuolar genes to observe vacuole morphology in treated cells.

C.U.13 Quantifying Melt Dynamics of Annapurna III Glacier in Nepal with Repeat Drone Photogrammetry

Alex Duren and Sophie Ulik
Co-authors: Niti Mishra
Mentor: Niti Mishra, Geography & Earth Science

Predicting the future of Himalayan glaciers requires understanding the impact of climate change on glaciers and developing such understanding in turn requires monitoring of changes in key glacier parameters such as area, mass balance and surface velocity. A preliminary assessment of satellite imagery-based analysis shows that orbital imagery lacks the required spatial pixel detail to quantify melt rates in three dimension and has high error budget. Therefore, this study uses field surveying and repeat drone photogrammetry derived 3D Digital Surface Models (DSMs) and Point Clouds over a selected benchmark glacier (Annapurna III) to quantify elevation volume change in glacial ice. An earlier drone survey of the selected Annapurna III glacier was carried out in November 2019. in November 2022, a follow up survey was conducted to map the glacier with a quadcopter drone. Total 2876 images over the glacier were acquired and were photogrammetrically processed to generate DSM and point clouds. The ground control points established in 2019 were relocated and utilized for processing the 2022 survey data and spatially aligning the results with earlier models. DSM differencing showed the spatial variation of changes in glacial surface elevation. These results highlight the suitability of drone data for fine scale monitoring of glacial processes

C.U.14 Effect of Dynamic, Static, and No Stretching on Sprint Performance and Flexibility

Noah Ecclestone, Anna Edsill, Jen Beattie, Emily Lange, Katie Kearney, and Joey Van Acker
Mentor: Salvador Jaime, Exercise & Sport Science

Stretching is known to increase the range of motion (ROM), alter the length and stiffness of the musculotendinous unit, and increase blood circulation while enhancing performance. Although some studies show static stretching improves ROM, most studies found dynamic stretching to have a greater impact on sprint performance. Conversely, static stretching has been associated with reduced force/power production. Purpose: This study is aiming to determine the effects that dynamic, static, and no stretching have on sprint performance, as well as hamstrings, hip flexor, quadriceps, and gastrocnemius ROM. Methods: This study will include 5 male and 5 female subjects between the ages of 18-23. Each of the three trials will consist of a 5-minute aerobic warm-up, a sit-and-reach test, a ROM test for hips, quadriceps, and

gastrocnemius, and three 20m-sprints. Trials will consist of either an extended aerobic warm-up, a 10-minute static stretching routine, or a 10-minute dynamic stretching routine all following the base 5-minute aerobic warm-up. The trials will be randomized. Results and discussion: Data collection and analysis is ongoing.

C.U.15 The Effects of Payroll and Team Retention on Success in the National Hockey League

Jacob Feinas
Mentor: Melissa Bingham, Mathematics & Statistics

The aim of my research was to explore the relationship of the amount of money a National Hockey League (NHL) team pays its players and the number of players retained from year to year and determine if there was an influence on that team's success. The purpose of this is to see if talent or team chemistry is the better predictor for success, and if there is a "sweet spot" that balances the two. This balancing act is vital for franchise success due to a multitude of reasons since these franchises are operated like a business. These include profit, fan base happiness, individual player happiness, locker room cohesiveness, and the prestige and accolades that come with sustained greatness. The initial exploratory analysis consisted of data scraping from websites with roster information and payroll from year to year, merging of the data, regression analysis, categorical data analysis, and data visualization using graphs and diagnostic plots. Utilization of these tools allows for patterns of team success to emerge and show how the top brass of these franchises should allocate their financial resources. There are two future implications for this project that I hope to see. The first is usage of my analysis by NHL teams to build a competitive roster that has a higher chance of success. The second is the extrapolation of this analysis to other major sports.

C.U.16 The Development of ZnO Ultraviolet All-Optical Switches

Brady Gagner and Justin Stevenson
Co-authors: Eric Gansen and Seth King
Mentor: Eric Gansen, Physics

The pursuit of faster communication has driven the development of new optical communication components, such as all-optical surface-normal switches constructed of semiconductor thin-film heterostructures. In such a device, strong control pulses and weaker signal pulses are spatially overlapped in the thin-film heterostructure and tuned to the band edge of the active semiconductor layer. The control pulse modulates the transmission of the weaker signal pulse by altering the absorption properties of the semiconductor. Zinc oxide (ZnO) is a promising switching material for all-optical switches that operate in the ultraviolet (UV) spectral region. It has a bandgap in the UV spectral region (3.4 eV) and is less toxic than other materials with similar bandgaps, such as gallium nitride (GaN). The structures we are studying are thin, polycrystalline heterostructures composed of alternating layers of ZnO and zinc magnesium oxide (ZnMgO), where the ZnO serves as the active semiconductor layer. Our structures are grown by DC sputter deposition. In our presentation, we present the results of experiments that demonstrate control-induced modulation of 120-ps signal pulses using ZnO/ZnMgO heterostructures with varying layer thicknesses. We will show how the modulation varies depending on the energy of the control pulses and the time delay between the control and signal pulses. Moreover, we will discuss the physical mechanism that is responsible of the modulation.

C.U.17 Drinking Motivations and Patterns of Alcohol Abuse Recognition in College Students

Allyson Goeden
Mentors: Katherine Kortenkamp and Bianca Basten, Psychology

Drinking in college is common among both undergraduate and graduate students and increases the risk of developing a substance use disorder. Drinking in college is also associated with peer misperceptions surrounding the quantity of drinks, frequency, and situations in which students drink. Understanding the "why" behind why students engage in drinking is important for preventing substance use disorders from developing. The current study examines individual motivations for drinking to make comparisons across ability to recognize problematic drinking behaviors. Participants completed an online survey containing scenarios with clinically mild drinking behaviors. They were then asked to rate their level of concern and their likelihood of recommending the imagined individual to speak with a professional. In addition to this exploratory analysis, we also examined if specific types of symptoms influenced these ratings.

C.U.18 The Young Women in Finland: A Study Linking Descriptive Representation to the Substantive Representation of Young Female Voters.

Alia Henrichsen
Mentor: Regina Goodnow, Political Science & Public Adminstration

Representation within a country and its government takes multiple different steps including formal, descriptive, and lastly substantive representation. Within the US the representation of young women in higher positions of government has been slim to none and not truly representative of the country's population through the descriptive scope. Taking a glance across the Atlantic Ocean, however, Finland is blinding with diversity of young women within the higher positions of government. And while the success of descriptive representation with young women is high within the Nordic country, further studies, specifically of its substantive representations of iyoung female voters are warranted. In this study, Finland's great descriptive representation of young women is observed and analyzed as well as the link between the descriptive and substantive representation of its young female voters. Making the argument that the link between descriptive and substantive representation of young women is strong within Finland. This analysis collects data from the Finnish National Election Study, data from the Finlex Data Bank, and other data relating to Finland's descriptive representation. Substantively, issues that involve environmental and social justice were prominent topics that were found to be prioritized by the young women population.

C.U.19 Shahdad: Exploration of Status at a Bronze Age Site in Southeastern Iran

Amanda Howell
Mentors: David Anderson, Archaeology & Anthropology, and Mark Chavalas, History

This paper analyzed Cemetery A at Shahdad, a Bronze Age site in Iran on the western edges of the Dasht-e Lut desert that was used from 2450 BC to 1900 BC. This paper aims to better understand social organization of Bronze Age cultures in the Near East. Shahdad is an urban center that was highly involved in trade as middlemen or producers of trade goods themselves. Excavations of the site revealed 3 cemeteries and a metalworking complex. The site either belongs to the Elamite culture to the west or the Oxus civilization to the east. I expected to see different classes represented in this cemetery, showing differential access to certain goods, and explored the data spatially to see how elites are organized within cemeteries. Hierarchical cluster analysis was used to place graves into 6 clusters. Types of grave goods aligned together indicate different strata within the society based on participation in craft production or trade. These clusters were viewed using ArcGIS maps to determine if the cemetery is sectioned by class. This study aided the understanding of organization at Shahdad and the importance of specialized craftsmen and economic administrators during this period in the Near East.

C.U.20 Investigating a Possible Oneota Winter Occupation in the La Crosse Region Using Faunal Analysis

Alexandra Huiras
Mentors: Constance Arzigian and Amy Nicodemus, Archaeology & Anthropology

This paper uses faunal remains from three archaeological sites in the La Crosse region to better understand Oneota settlement patterns. The Oneota were an indigenous culture that lived in the Upper Mississippi River Valley from 1200 to 1650 AD. They were agriculturists and skilled ceramicists, with groups across several states but united by their shared material cultural. Evidence for these occupations in the La Crosse locality are found at sites such as Tremaine, Swennes, and Valley View. There is good evidence for warm-season occupation at the large village sites, but the possibility of occupation in the winter is less clear. In this paper, features and their corresponding faunal data from each of these sites are analyzed to see if the Oneota left small groups of people behind during the winter months, while the main population went west to Minnesota to hunt bison. Some sites such as Swennes are already indicative of a winter occupation. This paper uses spatial analysis of the few winter-season features within larger villages to investigate whether such winter features represent short- term visits or seasonal occupations. This research could help support the theory of an Oneota winter occupation in La Crosse and develop our understanding of seasonal population movements.

C.U.21 Effect of Protein Phosphorylation on Apoptosis of Platelets Stored at Cold Temperatures in Human and 13-Lined Ground Squirrels

Abram Jackson, Emily BonoAnno, Benjamin Metzdorf, Jaiden Liu, Matthias Murphy, and Lakeyshi Xiong
Mentor: Scott Cooper, Biology

Platelets are small cells in the blood that are important when blood vessels are damaged to induce blood clotting. Patients with medical emergencies due to bleeding disorders may require platelet transfusions. Human platelets are not stored in the cold due to the platelets being rapidly cleared from circulation after transfusion. In contrast, ground squirrels have functional platelets after months of hibernation in the cold, which are not rapidly cleared upon arousal in the spring months. Differences in protein phosphorylation, the addition of phosphate groups to proteins within the platelets, is believed to be the cause of more stable platelets within ground squirrels. After comparison of protein phosphorylation of platelets in hibernating and non-hibernating ground squirrels, a protein called myosin light chain kinase (MYLK) was shown to have less phosphorylation during the winter time. FLICA and Annexin binding assays were used to fluorescently tag samples in order to determine the effect of the different treatments of activators or inhibitors, and subsequently determine their ability to protect cold storage samples to increase the quality and quantity of human platelets available for transfusion.

C.U.22 The Standing Power Throw is a Valid Assessment of Power and Explosiveness for Army ROTC Cadets

Anna Jacobson
Co-authors: Makenna Carpenter, Rachel Schmitt, Adrianna Marquardt, Ward Dobbs, Andrew Jagim (Mayo Clinic Health System), Joel Leudke (Mayo Clinic Health System), and Thomas Gus Almonroeder (Trine University)
Mentor: Ward Dobbs, Exercise & Sport Science

The Army Combat Fitness Test (ACFT) is a battery of standardized field tests designed to assess various aspects of physical fitness among United States Army personnel and Army Reserve Officers' Training Corps (ROTC) cadets. The standing power throw is one of six different field tests that comprise the ACFT battery. PURPOSE: The purpose of this study was to examine the relationship between standing power throw performance and measures of power and explosiveness derived from laboratory-based testing. METHODS: Fourteen Army ROTC cadets (men, n=12; women, n=2) completed the ACFT per annual requirements, which consisted of the standing power throw, participated in the current study. The standing power throw involves throwing a 10-pound medicine ball backwards and overhead for maximal distance. For laboratory-based testing, cadets completed countermovement jumps on a force platform that recorded ground reaction forces. RESULTS: There were significant ($p < 0.05$) strong, positive relationships between standing power throw distances and peak velocity ($r=0.73$), peak power ($r=0.64$), maximal rate of power development ($r=0.75$), and modified reactive strength index values ($r=0.66$) CONCLUSION: Findings from the current study indicate that better standing power throw performance corresponds with metrics related to power and explosiveness derived from forces recorded during countermovement jump testing.

C.U.23 Effect of Preferred versus Non-Preferred Music on Athletic Performance in College-Age Adults

Jasper Kiefer, Alec Akerman, Amanda Argall, Sydney Gentilli, Keegan Olin, and Luke Siewert
Mentor: Salvador Jaime, Exercise & Sport Science

During exercise, fatigue infringes on overall exercise performance mentally and physically. Studies have shown music increases exercise performance by reducing the perception of fatigue. Most studies have referenced the tempo of music on exercise performance, but there is little data on the effects of the preference of music on performance. Purpose: This study aims to investigate the effect of preferred versus non-preferred music on athletic performance in college-age adults, and whether preferred music can decrease the effect of exercised-induced mental and physical fatigue. Methods: This study will include between 10-20 college-aged subjects between the ages of 18 and 25. All three trials will consist of a self-paced treadmill-run, vertical jump test, and a Wingate 30-sec sprint test. The first trial will be completed with earplugs to eliminate any background music. Subjects will be randomly assigned to listen to their preferred or non-preferred music during the second trial and listened to the opposite music condition during the third trial. Sessions will be separated by at least 72 hours. Results and Discussion: Data collection and analysis is ongoing.

C.U.24 The Hmong Education Project: The Power of Public Cultural Education Programs

Erin Kirby
Mentors: Christine Hippert and Elizabeth Peacock, Archaeology & Anthropology

The United States contains many kinds of cultural groups and communities, and public-school education often overlooks inclusion of local cultural histories and knowledge. Wisconsin is home to the La Crosse school district, where there is a public cultural education program called the Hmong Education Project that uses the experiential learning method, where students learn by doing and reflecting, to teach 4th graders about the Hmong people, a prominent cultural group of the region. I look at the Hmong Education Project through participant observation and interviews to understand the goals and methods of education of the project. I have analyzed this data to find the positives and negatives of public experiential cultural education programs on a local level and learn how they would benefit the education system on a larger scale. This research suggests that when children learn about cultures and histories of local peoples through experiential learning, they gain a powerful understanding of their own communities and their place within them.

C.U.25 Receptor Interaction in Stem-like Breast Cancer

Delaney Klawitter
Co-authors: Jozie Arenz and Hunter Weik
Mentor: Sierra Colavito, Biology

Breast cancer is the most diagnosed cancer globally. There are many subtypes, each with varying features, prognoses, and responses to medication. Our lab studies claudin-low breast cancer. Claudin-low breast cancer is aggressive, behaves like cancer stem cells, and lacks viable treatment options. Recent research in our lab has demonstrated that claudin-low breast cancer cells are sensitive to a Checkpoint Kinase 1 (CHK1) inhibitor. This suggests that CHK1 function is necessary for survival of claudin-low cancer cells. However, in the clinical setting, cancer patients often develop resistance to drug treatments. Our research investigates the resistance mechanisms claudin-low breast cancer cells can use to evade CHK1 inhibition. We have obtained preliminary evidence that implies a receptor, AXL, is promoting resistance to CHK1 inhibitors. The AXL receptor has been shown to promote cell proliferation and metastasis, which cause the cancer cells to rapidly multiply and spread. AXL can be activated by interacting with other receptors, such as the Epidermal Growth Factor Receptor (EGFR). Prior research has shown the AXL receptor to interact with the EGFR receptor in other cancers. We are interested in determining if the same interaction applies to claudin-low breast cancer cells, and if this interaction can lead to resistance to CHK1 inhibitors. The findings of our research can be applied to the clinical setting and contribute to viable treatment of claudin-low breast cancer.

C.U.26 Regional Difference in Stress-Induced Disruption of Intestinal Epithelial Barrier Function

Abigail Klecker and Matthew Wright
Mentor: Sumei Liu, Biology

The intestinal epithelial barrier serves as a border and gateway for different substances in the lumen of the gut to enter the body. This barrier is semipermeable, allowing some substances (e.g., nutrients) in while blocking harmful materials from entering. This barrier is disrupted when exposed to various forms of stress, indicated by an increased intestinal paracellular and transcellular permeability. The intestine is a very long organ, and it is unclear whether stress increases intestinal permeability equally along the length of the intestine. In order to test the potential regional differences in response to stress, we will use C57BL/6 mice as a model organism. The experimental group will be exposed to restraint stress and the control group will remain in their home cages. Intestinal permeability will be measured at the duodenum, jejunum, ileum, proximal colon, and distal colon. Permeability will be measured by mounting mucosa/submucosa preparations onto Ussing chambers and recording FITC-inulin and horseradish peroxidase flux rates over time. We expect that different regions of the intestine will increase permeability differently in response to stress. Increased intestinal permeability has been linked to development of symptoms in irritable bowel syndrome (IBS), such as abdominal pain and change in bowel habits. Identifying the intestinal region most vulnerable to stress would help to understand the pathophysiology of IBS and develop targeted treatment for this disease.

C.U.27 Experimental Study of Creating Fatty Barriers in Replicated Oneota Ceramics to Boil Water

Zachary Konkol
Mentors: Constance Arzigian, Archaeology & Anthropology, and Jared Pfeiffer, Art

The Oneota were a Native American culture that lived in the upper Midwest of the United States of America from 1150-1650 AD. They were known and distinguished from other cultural groups in the area by their large, globular, shell tempered pots. Through observation of archaeological samples, carbonization and waterlines indicate these pots were used to boil water for cooking. Due to the porous nature of the pots I believe some type of barrier was needed to boil water. In this experiment I am recreating Oneota ceramics to see if they can boil water without a fatty barrier, with a fatty barrier created through dry cooking venison in the pots, and with a fatty barrier created by smearing lard over the entire interior surface of the pots. I hypothesize that the non-treated pots will not be able to boil water, while the dry cooked pots and the lard smear pots will be able to boil water. The lard pots will also boil at a faster rate. If it is true that a fatty liner is needed to boil water, then Oneota ceramics creation is more involved than previously thought.

C.U.28 *Dominus Vobiscum*: Catholic Ritual Participation and Engagement

Jasen Kracht
Mentors: Elizabeth Peacock and Vincent Her, Archaeology & Anthropology

Much work has been done within cultural anthropology studying religious ritual, but comparatively little of this has looked at the individual ritual experiences of Catholics regarding their participation in and engagement with the Mass from the perspective of presumed supernatural realism. Further, work in this field has not yet studied what such an analysis reveals about how religious rituals relate to both ritual as a whole and secular ritual specifically. I argue that religious ritual, as exemplified by the Mass, is a unique dimension of ritual which is essentially different from secular ritual and serves as a window into the function and purpose of religion itself. This project serves as a case study for such an argument, focusing on how Catholics experience the Mass, and presumes that the supernatural reality behind Catholic ritual exists and is active with such rituals. This is done to describe the Catholic ritual perspective more fully. To such an end, I used data collected from participant observation, surveys, and semi-structured interviews in my analysis. In all, this research offers, through its analysis of ritual participation of Catholics, a view of emic perspectives that give valuable insight into the nature, function, and purpose of religious ritual as a unique type of ritual essentially different from its secular counterpart.

C.U.29 Social and Moral Decisions: Does Uncertainty and Mood Matter?

Petar Lazic
Mentor: Katherine Kortenkamp, Psychology

Past psychological research has shown mood plays a significant role in the decision-making process and ethical decision-making specifically. This study expands on past research because previously published studies have not cross-examined the interplay of uncertainty and mood in decision-making. Data are currently being collected from college student participants. They are randomly assigned to one of six conditions in this 2x3 independent-groups design. Participants are assigned a mood condition (positive, negative) and an uncertainty condition (conflict, ambiguity, none). To induce a specific mood, participants are asked to recall a strong positive or negative memory. Research has shown this is an effective way to manipulate mood because while recalling the details of autobiographical memories the emotions associated with them become available. The type of uncertainty is integrated into the series of moral and social dilemmas that participants are asked to read and answer questions about. Participants also respond to a general decision-making style questionnaire, which measures whether they used more rational or intuitive decision-making when responding to the dilemmas. Data analyses will aim to test the hypothesis that a positive mood leads to more rational decision-making and assess if there is an interaction of mood and uncertainty on decision-making. This study will provide greater knowledge of how decision-making styles are influenced by certain moods and uncertainty.

C.U.30 Does Your Mind Quit Before Your Body? Correlates of Fitness Persistence

Stevan Lazic
Mentor: Katherine Kortenkamp and Kevin Zabel, Psychology

It has been found through previous research that self-affirmation plays a significant role in the success or failure people experience when working toward their fitness goals. For this project, college student participants completed an online

study that randomly assigned them to one of two prompts asking them to reflect on either their greatest success or failure in relation to their personal fitness journeys or goals. Participants then rated themselves on adapted versions of the Sport Commitment Scale-2 and the Sport Motivation Scale-6, well-validated scales for measuring the dependent variable: their willingness to persist towards their fitness goals. Participants also responded to questionnaires measuring depressive mood, state self-esteem, trait self-esteem, state anxiety, trait anxiety, and negative affect, to test whether these variables could mediate or moderate the relationship between self-perceived success or failure and an individual's willingness to persist. Data analyses will test the primary hypothesis that individuals assigned to write about their greatest failures related to their fitness will be more likely to report willingness to persist than individuals who were assigned to write about their greatest successes related to fitness. The secondary hypotheses pertain to how the additional emotional and cognitive variables will mediate and moderate this effect.

C.U.31 Refining the Timeline of Indigenous Occupation at Frog Bay Tribal National Park (47-BA-60)

Kirsten Amann
Mentor: Heather Walder and Constance Arzigian, Archaeology & Anthropology

The Middle Archaic period in Wisconsin (5,000 years ago) was a time of warming climate, new technologies, and changing lifeways. On the shore of Lake Superior there sits an archaeological site (47BA60) at Frog Bay Tribal National Park in Red Cliff, Wisconsin. This site gives us a glimpse into the past to understand what life was like for the Indigenous people of that time. By acquiring and analyzing new radiocarbon dates in conjunction with soil qualities and artifacts from two features at the site I will refine our understanding of the timeline and scope of occupations there and expand our knowledge of the Middle Archaic period in Northern Wisconsin. The results of this radiocarbon analysis also provide a greater understanding of Anishinaabe cultural history and past lifeways on the land that is now the Red Cliff reservation. All information gathered for this research is done in collaboration with the Red Cliff Nation and will be provided to their Tribal Historic Preservation Office so that it may be used to educate the public and inform future archaeological investigations. By working directly with the tribe, Indigenous knowledge and input plays a major role in the research. This method called Collaborative Archaeology prioritizes tribal resources and wishes to do arcaheology as culturally responsibly as possible.

C.U.32 Resting B*tch Face: First Impression Formation Based on Facial Expressions

Lauren Lopez
Mentor: Katherine Kortenkamp, Psychology

This experiment focuses on how people perceive others based off facial expressions. Experts suggest that by looking at someone's physical appearance for only a few seconds, people start to make judgements on that individual. We are surrounded by social norms that encourage people to smile, such as when posing for a picture for the yearbook or at a party. Given this social norm, how does a smile influence perceptions of personality traits? This study was done by showing participants a series of photos of both males and female faces, some were smiling and some we not smiling. The participants were then asked to rate the characteristics of the individuals on a 1-10 scale. By participants being asked to rate positive, negative, and neutral personality characteristics as well as attractiveness of the individual on the 1-10 scales. Data analyses will test the hypothesis that individuals smiling, will be perceived more attractive than individuals not smiling.

C.U.33 Environmental and Cultural Influences on Fishing Economies: A Case Study from Bronze Age Europe

Tricia Luedtke
Mentor: Amy Nicodemus and Constance Arzigian, Archaeology & Anthropology

Civilization was built on the banks of rivers that are home to thousands of species of fish. Fish are a readily available source of nutrition for the civilizations. However, fish have bones that are normally small, fragile, and often not well preserved; if preserved, they are found highly fragmented and are hard to identify, especially down to specific species. The people of the Maros Culture built their settlements on the marshy land near the major riverways of the Carpathian Basin in Eastern Europe during the Bronze Age (ca. 2700 – 1500 BC). This thesis analyses the fish remains found at four different sites of the Maros culture that are in diverse ecosystems. By looking at the percentage of fish within the faunal assemblage, along with the frequency and habitat of the different fish species, the basic subsistence practices of the Maros Culture can be better understood. Furthermore, examining the differences in fishing economies in the Carpathian Basin

in relation to both the ecological and cultural factors can help to better understand the human-environment relationships, along with how status differences can affect access to food.

C.U.34 Anaerobic Performance of Reserve Officers' Training Corp Members and Collegiate Wrestlers

Adriana Marquardt
Co-authors: Makenna Carpenter, Anna Jacobson, Rachel Schmitt, Daniel Freidenreich, Andrew Jagim (Mayo Clinic Health System), Joel Luedke (Mayo Clinic Health System), Thomas Gus Almonroeder (Trine University), and Ward Dobbs
Mentor: Ward Dobbs, Exercise & Sport Science

Various sports and tactical professions may require varying degrees of power to be successful. Purpose: The purpose of this study was to compare anaerobic power and capacity of Reserve Officers' Training Corp (ROTC) members and collegiate wrestlers. Methods: Male ROTC cadets (n=11) and collegiate wrestlers (n=20) were fitted to a cycle ergometer and after a brief warmup, they were instructed to pedal as fast as possible for 30-seconds at a load of 7.2-8.2% of their body mass. Relative peak and mean power (W/kg) were recorded and used to represent anaerobic power and capacity respectively. An independent T-test was used to compare anaerobic power and capacity between ROTC cadets and wrestlers. Results: Peak and mean power was significantly greater ($P < 0.001$) for the wrestlers (14.1±1.3, 9.1±0.6 W/kg) compared to the ROTC cadets (11.5±1.8, 8.2±0.7 W/kg), respectively. The coefficient of variation for peak and mean power was larger in the ROTC cadets (0.157, 0.085) than that of the wrestlers (0.093, 0.063). Conclusion: The results of the current study indicate that collegiate wrestlers can generate greater peak and average anaerobic power compared to ROTC cadets relative to body mass, suggesting greater variation between cadets than wrestlers.

C.U.35 Determining the Effect of Breast Cancer Cell Releasates on Megakaryocyte Susceptibility to Apoptosis

Audrey Mattmiller, Devin Woodcock, and Brooklyn Swenson
Mentor: Jaclyn Wisinski, Biology

Megakaryocytes regulate platelet concentration in the blood, which is vital to prevent the loss of blood from damaged vessels. Platelet concentrations that deviate from the normal range are correlated with an increased risk of cancer complications. Rap1b is a signaling protein in platelets and megakaryocytes that has been shown to protect cells from apoptosis in previous experiments. Megakaryocytes grow and produce platelets primarily in the bone marrow, which is a common location of breast cancer metastasis. Breast cancer cells release molecules to make a more suitable environment for cancer survival, which could have an effect on surrounding bone cells (osteoblasts) and megakaryocytes. The goal of this project is to determine if breast cancer cell releasates alter megakaryocyte apoptosis, and to determine if Rap1b influences the releasate-induced alterations. Wild type and Rap1b knock out DAMI megakaryocytic cell lines were incubated with releasates from breast cancer cells, osteoblasts, or osteoblasts influenced by releasates from breast cancer cells. Apoptosis, as measured by caspase activation, was determined using the Fluorochrome Inhibitor of Caspases (FLICA) assays and flow cytometry. Results from these experiments contribute to our understanding of the interplay between breast cancer and megakaryocytes in bone marrow.

C.U.36 How the Addition of a Dispersant to the La Crosse River Marsh Influences Bacterial Community Composition and Function

Emmie Milheiser
Co-author: Andrew Wells
Mentor: Bonnie Bratina, Microbiology

Crude oil is a very important resource widely used in modern society, but it can also have serious effects on the environment if a spill were to occur, like major changes in the composition of aquatic microbial communities as crude oil is a toxic chemical. However, some bacteria like *Oceanospirillales* and *Pseudomonas* can break down and use crude oil as an energy source. To assist bacteria in oil remediation, chemicals called dispersants were designed to break oil into smaller, more easily degradable droplets for microbial oil degradation. While this sounds like an efficient solution, it has yet to be fully practiced as there are many different crude oils, dispersants, and bacterial community interactions that have not been studied yet, like those of the La Crosse River marsh in Wisconsin. Oil transportation through the La Crosse River marsh has decreased over the years, but a spill could still occur. This project focuses on isolating microorganisms capable of oil degradation with the intention of testing their susceptibility to a dispersant, providing a small index of minimum inhibitory concentrations, or MICs, for these organisms. Not only will this provide information about the water quality

and aquatic organisms living in the La Crosse River marsh along with insight on how to treat an oil spill in the marsh should one occur, but it could also provide information regarding larger operations of oil bioremediation that strictly use microorganisms.

C.U.37 A Look into the Lives of Women During the Rise of Tango

Jayna Orris
Mentors: Keely Rees, Public Health & Community Health Education, and Rose Brougham, Global Cultures & Languages

The film *Naked Tango* tells a story based off of Stephanie, a wary bride who leaves her new husband and trades places with an unknown woman and soon finds herself in Buenos Aires. Tricked into thinking she will now be the faithful bride to Zico, Stephanie quickly realizes she has fallen into the hands of a captor and forced into being his sex slave. The story of Stephanie tells just one story, of one victim, that sadly reflects the reality of the many women living in Buenos Aires during the rise of the Tango; tricked into marriage, outnumbered by men, and victims of misogyny and violence. Stephanie's story echoes the sounds of other women forcibly put into brothels and made sex workers under a society that perpetuates the idea that men should hold power over women and their bodies. This investigation takes a dive into the imbalance of power and near ownership of women by men and the similarities between the story of Stephanie and the many other women alive in Buenos Aires during the rise of the Tango.

C.U.38 Beyond the Sherd: An Analysis of Eastern European Bronze Age Social Stratification through the Lens of Maros Culture Ceramics

Dominic Overby
Mentors: Amy Nicodemus and Timothy McAndrews, Archaeology & Anthropology

The Maros culture (2700-1500 BCE) was one of many Early-Middle Bronze Age regional polities in the Carpathian Basin. A Maros settlement where social organization remains relatively unknown is Rabe Anka Siget, a multi-mound tell site in northern Serbia. My research goal was to address this gap through an analysis of inequality as reflected in the ceramic assemblages from four localities: the west mound, the east mound, a smaller exterior mound, and the off-tell locality Majdan 28. I identified the differential proportions of fine ware, decorated, reduction-fired, and exotic ceramics between each locality to comprehend stratification through Maros ceramics. These four indicators have been previously associated with the display of status at Maros villages. I demonstrate that inhabitants of both the west and east mounds were of higher standing than those who occupied the external mound and Majdan 28, observed from the greater proportions of decorated and reduction-fired fine ware ceramics at the east and west mounds. The presence of exotic ceramics at the west, east, and external mounds suggests that they were reserved for occupants of the central tell, as no exotic ceramics were recovered at Majdan 28. Furthermore, status markers were displayed differently across the settlement, recognized from the inconsistency of ceramic and faunal assemblages between the east and west mounds.

C.U.39 Evaluating Corticotropin Releasing Factor Antagonist Influence on Stress Induced Changes in Body Mass and Composition in Mice Using a Bioimpedance Device

Addie Pauling and Alexis McMahon
Mentors: Cord Brundage and Sumei Liu, Biology

We evaluated the impact of restraint stress on the body mass index (BMI), body water and fat mass in control mice and those treated with corticotropin releasing factor (CRF) receptor antagonists. CRF1 receptors are thought to be responsible for more tissue specific effects of stress while CRF2 are thought to facilitate central pituitary CRF pathways. The extent to which either CRF receptor contributes to the systemic responses of stress is still unknown, but evidence suggests that CRF1 may be a larger contributor. We tested the hypothesis that a CRF1 antagonist would mitigate stress induced changes in BMI and body composition. Mice were divided into 4 treatment groups of 5 mice. One group served as non-stressed controls. The remaining 3 groups were each exposed to a standardized 1 hr restraint stress session daily for 5 days. One of the stressed groups received an intraperitoneal injection of CRF1 antagonist and the other a CRF2 antagonist 30 minutes prior to each restraint session. After the 5th stress period all mice were euthanized. Weight, length, BMI and bioimpedance data was recorded. Treatment groups experiencing restraint demonstrated reductions in BMI at least in part due to reductions in total body water and fat. Treatment with CRF1 or CRF2 antagonists attenuated these changes in BMI and bioimpedance. These results suggest that both CRF1 and CRF2 receptors may play a role in mitigating the systemic effects of repeated restraint stress in mice.

C.U.40 Sex Differences in the Role of CRF1 and CRF2 Receptor in Stress-Induced Increases in Intestinal Permeability

Caroline Sargent and Lauren Broman
Mentor: Sumei Liu, Biology

Stress has been known to increase intestinal permeability and negatively affect the intestinal epithelial layer in the gut. This increase in intestinal permeability leads to the development of irritable bowel syndrome and other intestinal issues. Corticotrophin releasing factor (CRF) is a hormone released during the stress response. CRF, a peptide hormone, has been related to the etiology and symptom severity of irritable bowel syndrome. CRF binds to both CRF1 and CRF2 receptors. The effect of the CRF1 and CRF2 receptors on paracellular and transcellular permeability of the intestinal epithelial layer of female mice were previously studied. The experiment was carried out on an all-male mice study to determine if there is sex differences in the impact of stress on intestinal permeability. The CRF1 and CRF2 receptors were blocked using their respective antagonists. Then restraint stress was used to observe the effectiveness of the antagonists in preventing stress and CRF-induced increases of intestinal permeability. The NBI antagonist showed to be highly effective at preventing intestinal permeability in the stress + NBI groups whereas the Antisauvagine-30 antagonist showed to still allow for increased intestinal permeability for the male mice. This data was then compared to the previous female mice experiment to determine if there were sex differences in intestinal permeability.

C.U.41 A Settlement Pattern Analysis of the Lower Santa Valley of Peru Between Two Periods Using Geographic Information Systems

Sean Schaber
Mentors: Timothy McAndrews and David Anderson, Archaeology & Anthropology

The transition between the Initial Period (1800 B.C. – 900 B.C.) and Early Horizon Period (900 B.C.) in Peru is among the most important in understanding the increasing complexity of societies in the region. It has long been thought that a dominant culture founded in the Early Horizon Period around the type-site Chavín de Huantar flourished organically. However, with increased archaeological research, we now know that previous coastal cultures in the Preceramic (3000 B.C. – 1800 B.C.) and Initial Periods had a profound influence on this Chavín culture. This demonstrated continuation of culture, mostly materialized through iconography, is notable because it differs from the settlement patterns of these time periods. Contrasting settlement patterns throughout different time periods can be a notable marker for changes in social organization. Through a geographic information system analysis (GIS), this thesis investigates and quantifies these differences in settlement patterns in the Lower Santa Valley of Peru between the Preceramic/Initial Periods and Early Horizon Period. As a result, we are able to see an increased complexity in the social organization and settlement patterns of the Early Horizon Period in contrast to preceding periods.

C.U.43 Exploring the Dynamics of Planetary Mirrors under Radiation Pressure Orbiting Tidally Locked Planets

Braeden Weix and Kelvin Scheurer
Mentor: Shauna Sallmen, Physics

Scientists have considered using large, lightweight mirrors to provide added heat to the surface of Mars to make the planet more habitable (e.g. Birch 1992). However, what if this idea has already been applied by an extraterrestrial civilization in an effort to direct starlight onto a planet, either because one side is permanently dark, or they wish to alter the climate? A tidally locked planet is one that has an orbit in which the same side of the planet is always facing the host star, and therefore, one side is permanently dark. For some types of stars, this can happen for planets in the habitable zone - i.e. ones that could have liquid water on the surface. Extraterrestrials on a tidally locked planet could possibly make use of large, lightweight mirrors to provide starlight to the dark side of that planet. The effects of radiation pressure on orbit stability of large, lightweight mirrors hasn't been well studied but our research group is trying to change that and gain insight into the intricacies of accomplishing such a task. We have run and are analyzing various simulations of mirrors orbiting potentially habitable planets around different stars. It is clear that radiation pressure (RP) plays a significant role in the mirror's orbit shape and survivability. All of our previous simulations are for planets at the inner edge of the habitable zone. We will present the results of simulations for planets at other distances from their star.

C.U.44 Small Uncrewed Aerial Vehicle (sUAV) Based 3D Spatial Modeling Applied to Archaeological Site Identification and Interpretation

Jamin Wolfe
Mentors: Constance Arzigian, Archaeology & Anthropology, and Niti Mishra, Geography & Earth Science

Using small Uncrewed Arial Systems (sUAS) and the application of photogrammetrical principles and technology, it is now possible to explore archaeological sites and landscapes like never before. This research project, located at the early Bronze Age site of Rabe Anka Siget in northern Serbia, aims to investigate small uncrewed aerial system (sUAS) based 3D spatial modeling applied to archaeological site identification and interpretation. Specifically, it will determine if 3D spatial modeling derived from sUAS imaging can develop highly accurate geospatial models to identify archaeological sites. By detecting and modeling elevation and landscape change patterns, it is possible to locate anthropogenic features in the landscape that may be overlooked during a terrestrial survey. This research posits that human-modified landscapes are detectable, and this approach is holistic in considering landscape variations, whether monumental structures or subtly terraced agricultural areas. Furthermore, it will show how these models will help interpret a site's social and spatial organization and how they can aid in developing targeted excavation strategies based on that data. This data shows that advancements in remote imaging and digital technologies are a reliable resource for creating detailed geospatial models for archaeological research and that the cost-benefit associated with its implementation can increase the efficacy of archaeological survey.

Poster Session D
12:05 pm-1:00 pm

D.U.1 Microplastic Ingestion by Zebra Mussels (*Dreissena Polymorpha*) in the Upper Mississippi River: Is Location Within the River an Important Factor?

Colby Hietpas
Mentor: Eric Strauss, Biology

The use of plastics has increased ever so rapidly in our society and it is not slowing down. They are non-biodegradable substances that are accumulating in landfills and our natural environment, and in this study, I will look at the Upper Mississippi River (UMR), which has a large amount of human interaction. They break down through a variety of processes to become what is considered microplastics. Microplastics are thought to be contaminants of emerging concern that is a plastic whose largest size is less than 5 nanometers. These microplastics can be ingested by aquatic life, such as Zebra Mussels, that can have direct and indirect effects on these species. Zebra Mussels are important filter feeders in the aquatic environment, which puts them at a higher risk of ingesting microplastics. This study will focus on if microplastic concentrations in Zebra Mussels have a location dependence. The zebra mussels were collected from four locations along the UMR channel on three different dates for replication. The microplastic concentrations from these samples will then be compared against each other to see if there is a dependence in location. These samples will also be analyzed to see what types of microplastics are being ingested by Zebra Mussels along the Upper Mississippi River channel.

D.U.2 Impact of Alzheimer's Disease on Resetting the Circadian Clock

Gavin Hutchison
Mentor: Alder Yu, Biology

Alzheimer's disease (AD) is a neurodegenerative disease that has become increasingly prevalent. AD has a wide variety of symptoms including those which impact the circadian rhythm, the molecular clock that runs at about 24 hours responsible for regulating many body functions. AD has been found to interfere with the circadian clock. These interferences with the circadian clock and sleep schedules have been found to be one of the leading causes of institutionalization in AD patients. Yet, it is unknown whether AD impacts the ability to reset circadian clocks. Knowing the impacts of AD on the ability to reset circadian clocks would be beneficial to care for people with AD. Understanding the flexibility or rigidity of the circadian clock in people with AD may help develop new treatments. A fruit fly model of Alzheimer's disease was be used to study this. Alzheimer's models of fruit flies have been found to exhibit similar circadian rhythms to humans with AD and have been established as a good model for studying AD's impacts on circadian rhythms. It has been discovered that the circadian rhythm patterns of fruit flies with AD are greatly diminished, tracked by locomotor activity. Further investigation is being done to explore the cause of this finding.

D.U.3 Ketone Bodies and Their Impact on the Reactivation of the Epstein Barr Virus in Burkitt Lymphoma Cells

Ben Walker
Mentor: Kelly Gorres, Chemistry & Biochemistry

Our research focused on better understanding the reactivation of the Epstein-Barr Virus (EBV) in Burkitt lymphoma cells caused by known inducer sodium butyrate (NaB). We focused on two properties of interest for NaB: its structure and its inhibition of histone deacetylases (HDACs). Butyrate is produced by gut bacteria in the body and is helpful in maintaining homeostasis and can help regulate lipid metabolism, where ketone bodies are produced. The ketone bodies acetoacetate and 3-hydroxybutyrate were tested because of their structural similarities with NaB. Measuring EBV reactivation was done through reverse transcriptase quantitative polymerase chain reaction (RT-qPCR) looking for the viral gene BZLF1, which transcribes the early reactivation regulating protein ZEBRA. NaB being a HDAC inhibitor means it keeps acetyl groups attached to histones, which keeps them less tightly wrapped around DNA and increases gene transcription, such as prompting viral reactivation. Western blots measuring acetylated histones were used to determine if ketone bodies also exhibited HDAC inhibition. Better understanding the relationships between butyrate and EBV reactivation and the role of ketone bodies can provide targets for future research on reactivation-based treatments.

D.U.4 Factors Released from Breast Cancer Cells May Affect Megakaryocytic DAMI Cell Proliferation

Caleb Andrews and Katie Johnston
Mentor: Jaclyn Wisinski, Biology

Platelet production by bone marrow resident megakaryocytes and clearance by hepatocytes regulate blood platelet counts. Low platelet counts delay cancer treatment due to bleeding risk, while high platelets counts can correlate with increased metastasis of some cancers. Metastatic breast cancer can make its way into the bone marrow and may influence megakaryocyte proliferation to increase platelet production. The small GTPase, Rap1b increases in abundance as megakaryocytes mature into platelet factories and mediates survival in other cell types. We used CRISPR/Cas to specifically disrupt the Rap1b gene, resulting in no detectable Rap1b protein in DAMI cells. Compared to wild-type DAMI cells, Rap1b knockout cells had a slower proliferation rate and a reduction in BrdU incorporation, suggesting delayed entry into S-phase. Previous data suggests that breast cancer cells release factors that affect osteoblastic bone cells to release other factors that increase proliferation of megakaryocytes. To determine if proliferation of megakaryocytic DAMI cells can be influenced by factors released from breast cancer cells and/or osteoblasts, the MTS proliferation assay was conducted on DAMI cells with conditioned media from breast cancer cells and/or osteoblasts.

D.U.5 An Analysis of How The Lifestyle of Tango Has Evolved into the 21st Century

Fallon Ash
Mentor: Rose Brougham, Global Cultures & Languages

In the movie, Assassination Tango, Robert Duvall directs and plays John J. as he embarks on a journey into the world of tango in Buenos Aires, Argentina. As an assassin, John J. lives in Brooklyn, New York with his girlfriend, Maggie and her daughter, Jenny who he is very close to. When John is given the job to assassinate an Argentinian general, he sets out to finish the job promptly. Due to an unforeseen extension to his trip, John discovers the sensual world of tango through Manuela, a tango dancer. The temptations that come with sensual footwork and late nights of indulging caused John to lose sight of what matters to him. This film portrays the milonga lifestyle of drinking, expressing sexuality, and creating palpable intimacy as an influential distraction for John. Duvall is able to capture the temptations that tango creates within its dancers and put a modern twist on the lifestyle that still remains similar to that of the 19th century.

D.U.6 Charcoal Analysis of a Sediment Core from Mud Lake, WI

Sam Baumgartner, Jaydin Romalia, and Jackie Oetterer
Mentor: Joan Bunbury, Geography & Earth Science

The Middle-Mississippian people settled in southern Wisconsin around A.D. 1050, near what is now known as Aztalan State Park. The site was occupied for a couple of hundred years until it was abandoned around A.D. 1200. Little is known about why they chose to leave the site, which is what this research aims to address. A sediment core was collected from Mud Lake in Jefferson County, Wisconsin in January 2014 for the purpose of developing a climate record for the Aztalan

site. We will be analyzing charcoal from the 4-meter sediment core in 1 cm increments. Each centimeter of sediment will be extracted, treated with hydrogen peroxide and sodium hexametaphosphate, sieved and dried for 48 hours, and finally counted for the presence of charcoal. Charcoal counting is a new method used in our laboratory and we will be using standard procedures of splitting a petri-dish into sections and analyzing each one at maximum magnification. Each piece of charcoal is determined to be grass or non-grass based on characteristics of size and texture. By analyzing charcoal, we can determine if its presence is from natural or anthropogenic sources. A common proxy used in relation with charcoal is pollen. Several other projects conducted on these sediment cores will corroborate our data, giving an idea as to why the Aztalan people abandoned the area. This will help us develop a better understanding of how the climate impacted the activities of the Middle-Mississippian people during this time.

D.U.7 Effects of a Carbohydrate Mouth Rinse on Muscular Endurance of Different Sized Muscle Groups in Resistance Trained Young Adults

Nicole Brandt, Brandon Bernardo, Brenner Gosh, Jenna Nichols, and Haley Phoulavan
Mentor: Salvador Jaime, Exercise & Sport Science

Carbohydrate mouth rinse (CMR) improves performance through oral carbohydrate sensory neurons that activate reward centers of the brain, increasing motivation and neural drive. Previous research has shown that a CMR has statistically significant effect on training volume during bench press (BP) but not leg press (LP). This suggests CMR may have a greater effect on smaller muscle groups. Purpose: This study aims to determine whether a CMR affects ME differently in muscle groups of different sizes: quadriceps, pectorals, and biceps. Methods: This study will include 14 resistance-trained adults, ages 18-26, with no current injuries. It includes three testing days, 48-72 hours apart. Day one consists of calculating a one-rep max (1RM) for LP, BP, and preacher curl (PC). In following meetings, subjects perform three trials to failure with 80% of their 1RM per exercise with 25 mL of 6% maltodextrin solution or water rinsed before each set. Perceived exertion and maximal repetitions will be recorded after each set. Exercises are performed in order of descending size: LP, BP, then PC. Results and discussion: Data collection and analysis is ongoing.

D.U.8 Investigating Microvascular Outcomes with Ischemic Pre-conditioning and Passive Stretch

Sarah Fenn
Co-authors: Maxwell Walker and Jacob Caldwell
Mentor: Jacob Caldwell, Exercise & Sport Science

Passive stretching (PS) elicits hypoxia of the skeletal muscle that is similar to limb occlusion like that shown with ischemic pre-conditioning (IPC). However, the magnitude of responses between PS and IPC as they pertain to vascular outcomes are unknown. The purpose of this study is to investigate intermittent passive stretch to intermittent ischemic pre-conditioning on microvascular responsiveness. Given the increased metabolic activity during PS, we hypothesized that passive stretch will be a more effective method to improve microvascular function than IPC. 15 college-aged subjects participated in 2 lab visits one-week apart. Each visit started with a rest period, baseline blood pressure, and heart rate measures. A post occlusive reactive hyperemia (PORH) test was performed prior to and after each intervention. An intervention of PS or IPC consisting of 5-minutes “on” 5-minutes “off” four times through occurred after pre-testing. IPC consisted of bilateral cuff inflation on the upper. PS consisted of splinting devices placed bilaterally on the subject’s feet and stretched to moderate discomfort. The PORH was repeated after each intervention. Data collection and analysis is ongoing.

D.U.9 Post Exercise Microvascular Responsiveness after Repeated Passive Stretching

Lukas Bekkedal and Sarah Fenn
Mentor: Jacob Caldwell, Exercise & Sport Science

Passive stretching has been shown to improve shear stress that may act to protect exercise induced vasodilation. Unfortunately, no studies show how muscle microvasculature is impacted after stretch. This study investigated repeated passive muscle calf stretching and its effect on microvascular responsiveness after treadmill exercise. We hypothesized that passive stretching would improve microvascular responsiveness after treadmill exercise and be impaired in the control group. 18 males and females underwent a single lab visit to assess repeated passive stretching on the microvascular responsiveness. Passive stretching was performed with a splint device placed on each foot for a 5-minute constant stretch, 5-minutes of relaxation, and repeated 4 times. Microvascular responsiveness was measured during three vascular occlusion tests (VOT). Measurements consisted of a VOT pre-stretch, VOT post-stretch, and a VOT post-treadmill

exercise. Participants were placed in the sham-control or passive stretching group. After stretching, 60% peak oxygen uptake was calculated using a treadmill test. Next, 30-minutes of treadmill exercise was performed at 60% VO2 peak. Near Infrared Spectroscopy was placed on the lateral head of the gastrocnemius throughout testing. This investigation suggests that in healthy, college aged individuals, passive stretching does not suggest improved microvascular responsiveness although clinical populations may show different responses.

D.U.10 Food Fight: Faunal Analysis Comparing Riverine and Lake Locality Oneota

Leah Burke
Mentors: Constance Arzigian and David Anderson, Archaeology & Anthropology

The Indigenous Oneota lived throughout the Upper Midwest from AD 1000- 1650. They were maize agriculturalists, but also utilized wild resources, particularly fauna to supplement their diet. Once maize agriculture intensified, it allowed for an increase of population and settlements became concentrated in several localities with good agricultural land. In this paper, I will compare animal remains from two sites from each of two localities, including the faunal remains from Feature 268 at the Tremaine site, which I identified. The first locality is La Crosse, Wisconsin, with steep bluffs and the large Mississippi River; the second locality is Lake Koshkonong in eastern Wisconsin, with a large lake, rolling hills, and rich farmland. Since the La Crosse locality is closer to deeper waters and more abundant aquatic resources than the Lake Koshkonong locality, I expect La Crosse to exploit more and more diverse species of fish, whereas I expect Lake Koshkonong to exploit large mammals for their protein supplement. I will compare proportions of faunal remains and from which ecological zone the fauna comes from. The environment not only affects subsistence but also social structure; in this paper, I plan to explain possible causes and consequences for the difference in faunal frequency

D.U.11 How Radiation Pressure Affects Large Mirrors Orbiting Exoplanets of Different Mass

Benjamin Callies and Hayley Schultz
Mentor: Shauna Sallmen, Physics

Analyzing the dimming of light when an exoplanet transits in front of its star is commonly used to identify exoplanets. When a planet's orbital period is equal to the rotational period, it is tidally locked and one side of the planet will always face the star. As described by Korpela, Sallmen, and Green (2015), many orbiting planar mirrors of 1 km2 and 1000 kg could be used to redirect starlight onto the dark side of an exoplanet, or in general to alter a planet's climate. When in use, these sizable and lightweight mirrors would be subjected to radiation pressure (RP) of starlight. To investigate their orbit stability under the influence of RP, our team simulated the orbit around an Earth-sized planet around various types of stars, with various initial mirror orbit parameters. The planet was located at the closest distance to the star at which liquid water might survive on its surface, since then the probability of being tidally locked is elevated. We simulated situations when RP always affects the mirror (Always), affects it only on the dark side of the planet (Night), contrasting the results with those for unapplied RP. For each, we determine if the outcome is a mirror-planet collision, escape from gravitational influence or 1000 orbit survival. Slight changes in RP and gravitational forces substantially alter the mirror's end state. We will compare simulations for mirrors orbiting planets of different masses with those for Earth-sized planets.

D.U.12 The Occurrence Patterns of Slimy Sculpin, Western Blacknose Dace, White Sucker in the Coon Valley Watershed

Emma Coltman and Tracy Joe
Mentor: David Schumann, Biology

The Coon Valley watershed supports numerous coldwater streams with well-known trout populations in the Driftless Area of southwestern Wisconsin. Numerous research efforts have documented the occurrence and habitat requirements of sportfish in the region, but less is known about the non-game fishes. To provide a new understanding of the ecology of these lesser-known fishes and inform potential management efforts, we conducted backpack electrofishing at four streams: (1) identify the occurrence patterns of Slimy Sculpin (Cottus cognatus), Western Blacknose Dace (Rhinichthys obtusus), and White Sucker (Catastomus commersonii); (2) compared the catch-rates and size structures of each species amongst four sampled streams; and (3) quantified the relationship between relative abundances and common stream characteristics. Electrofishing occurred at six 100-m sampling sites in four separate streams (N = 24): berge, hohlfeld, rullands, and spring coulees. All captured fish were identified, counted, and measured to total length (mm) before release. Water chemistry, instream characteristics, and riparian conditions were measured at 11 transects at each site. A Kruskal-

Wallis test was used to compare relative abundances of each species among streams. Although mean catch rates of Slimy Sculpin, and White Sucker varied among the streams, there was no statistical difference among streams for either species. Further analyses can describe the relationships between fish and their environment.

D.U.13 Perceptions of Therapeutic Recreation Undergraduate Students Following a Telehealth Service-Learning Program

Rachel Gundrum and Abigail Fleischmann
Mentor: Jennifer Taylor, Recreation Management & Therapeutic Recreation

Rapid changes were needed to continue service-learning projects for therapeutic recreation college students in long-term care settings (i.e. nursing homes) during the pandemic. Inspired by the novel, The Happiness Project by Gretchen Rubin, a University Wisconsin-La Crosse (UWL) graduate student, with faculty mentorship, developed an evidence-based curriculum which was then implemented in an undergraduate therapeutic recreation service-learning course. The innovative curriculum focuses on increasing feelings of happiness using PERMA, a theoretical model grounded in positive psychology. This poster has two aims: 1.) Outline the UWL Happiness Project, a ten-week, telehealth program implemented between a skilled nursing facility in rural Wisconsin and an undergraduate therapeutic recreation course, 2.) Examine therapeutic recreation undergraduate students' perceptions of older adults after implementing the telehealth program. The poster will share outcomes and valuable lessons learned amid the pandemic from the next generation of therapeutic recreation students pursuing careers in the field of gerontology.

D.U.14 (Im)Proper English: Exploring Identity with a Stigmatized Accent

Jess Schaefer
Mentor: Elizabeth Peacock, Archaeology & Anthropology

This project centers on the experiences, thoughts, and opinions of English second language (L2) speakers who are employed faculty and academic staff at a predominantly White institution. This study relied on snowball sampling faculty at the University of Wisconsin La Crosse speak English with a stigmatized non-native accent. Sixteen faculty members were interviewed in a private setting, with questions focusing on self-perception and belonging as relating to their L2 accent. Notes and over ten hours of audio recordings from each session were coded with patterns relating to identity, using language as a tool, and belonging at UWL, in the Midwest, and in the United States. Implications from this study may guide future inclusion efforts on the university campus in order to create a more welcoming community for everyone, expose the personal effects of societal bias, and reduce the stigma around a foreign accent.

D.U.15 Central Breathing Responses to Carbon Dioxide (CO_2) Following Chronic Nicotine Exposure

Karin Hayford
Co-author: Cord Brundage
Mentor: Cord Brundage, Biology

Developmental nicotine exposure is a risk factor for Sudden Infant Death Syndrome (SIDS). This may be due to the effects of nicotine on the development of breathing control regions in the brain. For this project we evaluated nerve signals from the brainstems of bullfrog tadpoles that innervate breathing muscles. Like humans, tadpoles will increase their breathing rate in response to high CO_2 (hypercapnic) environments. We are testing whether tadpoles exposed to a moderate amount of nicotine (30 μg/L) for 10 weeks will still have the same central breathing response. Two extracellular suction electrodes are placed on cranial nerves (V & VII) in the excised brainstem from control and nicotine exposed tadpoles to measure the lung burst activity between normal (1.5% CO_2) and hypercapnic (5% CO_2) conditions. The expected response for control tadpoles would be an increase in the breathing rate when exposed to hypercapnic environments. We hypothesize that chronic nicotine during development will not affect normal CO_2 breathing patterns but will blunt the response to hypercapnic conditions. This impairment diminishes the capacity of the body to offload CO_2. An inability to offload CO_2 creates a toxic state (respiratory acidosis). If developmental nicotine exposure contributes to an increase in respiratory acidosis during hypercapnic condition that may explain a potential mechanism by which nicotine increases the risk of SIDS.

D.U.16 Feeding Behaviors and Food Preference of *Drosophila melanogaster* with Abnormal Circadian Rhythmicity

Maya Jahnke
Mentor: Alder Yu, Biology

Circadian rhythms are important regulators of a variety of physiological processes that occur over a 24-hour environmental cycle. Disrupting this 24-hour cycle can negatively impact many fundamental processes that rhythmically occur in an organism. Chronic disruptions in circadian rhythmicity, such as shift work disorder, have been shown to contribute to the development of a diseased metabolic state such as obesity or diabetes. To better understand this link between disrupted circadian rhythms, we previously collected data demonstrating higher consumption of food in *Drosophila melanogaster*, or fruit flies, under conditions of circadian disruption. The objective of the current project seeks to further investigate this relationship by utilizing an automated feeding-behavior monitoring system (FlyPAD) to measure fruit flies' interaction with different food substrates. We hypothesize that flies exposed to severe circadian rhythm disruption will have more frequent feeding activity and increased interaction with high-sugar energy food compared to flies subjected to normal light/dark cycles. Our preliminary results suggest that flies on a non-disrupted rhythm prefer normal food over high-sugar food.

D.U.17 Tutoring and Student Success at the University of Wisconsin-La Crosse

Allyson Goeden
Co-author: Jill Kittelson
Mentors: Douglas Baumann and Barbara Bennie, Mathematics & Statistics

Our research explores usage patterns of the mathematics and statistics tutoring services provided by the University of Wisconsin La Crosse (UWL), and how these patterns relate to student success. Tutoring is provided to students at no charge and supports 100-200 level courses and is staffed by undergraduate and graduate students. This exploratory analysis identifies general trends in student use, and statistical models were built to identify connections between student success and frequency of attendance. Our data consists of timestamped information per student visit for the Spring 2022 semester. Student attendance information was joined by ID number to other metrics (class standing, GPA prior to Spring 2022, demographic information, and overall grade in the class they received support for). Data for a comparison group of students in the same classes that did not attend the tutoring center during the semester was also collected. Statistical models (ordinal and logistic regression) are created to relate student success to how often they attended tutoring. By including a comparison group, we can compare success rates between those who attend tutoring and those who do not. Our results highlight how student success metrics link to the tutoring center service provided by the university. Additionally, these results provide insight into student use that inform staffing decisions, funding and provides a foundation for UWL to continue monitoring these relationships.

D.U.18 Too Fem for STEM: The Role of Femininity in Credibility Perceptions

Taylor Klump
Mentor: Katherine Kortenkamp, Psychology

Shown in several studies, women in STEM have reported they do not feel comfortable wearing skirts, expressing emotions, or doing anything deemed feminine as they do not want to seem unfit for their role. These factors may be related to why women are underrepresented in higher paying STEM careers compared to men. To explore perceptions of women in STEM, participants in an online study were randomly assigned to read a research blog post that was either STEM related or non-STEM related alongside an image of a female author, who was edited to look either more feminine or more masculine. Participants then responded to questions from the Muenster Epistemic Trustworthiness Inventory scale to measure their perceptions of the author's credibility as well as other questions about the quality of the blog itself. Data analyses will examine the hypothesis that the more feminine author will have a lower credibility rating than the more masculine author for the STEM blog. This project can help to uncover underlying gender biases related to perceptions of STEM researchers.

D.U.19 Effects of Stereotype Threat on Executive Function in Adults

Linnea Lerwick
Co-author: Abby Kuna
Mentor: Ellen Rozek, Psychology

Stereotype threat has been found to negatively impact older adults' scores on executive function tasks. However, there is limited research on the effects of aging stereotypes on middle aged adults. We propose to examine the effects of stereotype threat on executive function across three age groups: young, middle-aged, and older adults. To test this hypothesis, all participants will be randomly assigned to either a stereotype threat condition or the non-stereotype threat condition. We plan to investigate the role that stereotype threat might have on an executive function task using the "Age Identification Scale and the Attitudes Towards Own Aging" questionnaire to establish stereotype threat and using the Digit Span and the Wisconsin Card Sorting Test to assess executive function. We hypothesize that middle-aged and older adults will have lower performance under the stereotype threat condition than their counterparts in the non-stereotype threat condition and than younger adults in both conditions.

D.U.21 "I'm So Hungry I Could Eat a Horse!": Hunger, Self-Control, and Religious Coping

Alexis Misco
Mentors: Katherine Kortenkamp and Kevin Zabel, Psychology

Being hungry is a routine part of being a human. Anyone can understand having feelings of hunger while only being able to contemplate the next source of food. Many previous studies have evaluated the relationship between being hungry and impulsivity, decision making, and other similar topics. This study extends previous research by examining how different types of coping may reduce the effects of hunger on self-control. College student participants were randomly assigned to fast for four hours before taking part in this study while a control group was instructed to eat a snack or meal before the study. Then participants came to a lab to complete an online Qualtrics survey that included questions about hunger, self-control, collaborative religious coping, and other types of coping behavior. Additionally, participants completed a Stroop task to measure current levels of self-control. Data analyses will test the hypothesis that hungry participants will have a decreased ability to maintain state self-control but can bridge this gap through religious collaborative coping mechanisms through giving the individuals who have this form of coping higher levels of trait self-control.

D.U.22 Investigation of Activated, Cytosolic Rap1b in Human Megakaryocytes

Jack Morrison and Josh Jenness
Mentor: Jaclyn Wisinski, Biology

In platelet-producing megakaryocytes, the signaling protein Rap1b mediates both activation of integrins for cell adhesion and activation of the transcription factor ERK leading to gene expression changes. As a small G-protein, Rap1b acts as a molecular switch with an inactive GDP-bound state and an active GTP-bound state. Additionally, the association of Rap1b within the inner side of the plasma membrane is dictated by cAMP-dependent protein kinase (PKA) phosphorylation. In an unphosphorylated state, Rap1b is attached to the plasma membrane via a lipid anchor. Upon phosphorylation, Rap1b detaches from the membrane and is cytosolic. We hypothesize that activated, phosphorylated Rap1b, dictated by the guanine nucleotide bound (GDP/GTP) and its phosphorylation status, exists freely in the cytosol and is involved in signaling pathways that may result in proliferation and differentiation of the cell. To evaluate this hypothesis, we need to use methods to detect Rap1b activation (GTP binding) and phosphorylation. Using the megakaryocyte cell line (DAMI), we treated the cells with a lysate and then used reagents to stimulate activation (GTPγS) and phosphorylation (forskolin). To determine activation, GTP-bound Rap1b will be isolated using magnetic beads coupled to a GST-tagged protein and a Rap1b-GTP-binding domain. This protein-antibody complex is detected using an SDS-PAGE to determine which cell samples have phosphorylated Rap1b protein.

D.U.23 Does Your Smartphone Make You Stupid? The Relationship between Smartphone Use, Time Management Skills, and Academic Performance

Matthew Mulcahy
Mentor: Katherine Kortenkamp, Psychology

In the past decade, cell phone technology has rapidly advanced our capability of accessing the internet and connecting us with the world. It is practically a necessity to own one to navigate our modern society. Research has shown a strong relationship between how students manage their time and their academic performance. However, little research has been done examining the relationship between smartphone use, how well students manage their time, and academic performance. For this project, college student participants completed an online survey assessing their time management skills, daily cell phone usage, and academic performance. Participants completed previously validated self-report rating scales measuring how often they engaged in time management behaviors and problematic cell phone usage. They also reported high school and college grades and ACT/SAT scores. Participants reported cell phone use by accessing the data recorded by their smartphones about their screen time usage from the previous week. I hypothesize that people who spend more time on their cell phones will have worse time management skills, and worse academic performance.

D.U.24 Determining the Effects of Poly-A Tracts and Monovalent Cations on Nucleosome Unwrapping Equilibrium

Morgan Priem
Mentor: Daniel Grilley, Chemistry & Biochemistry

Nucleosomes, composed of 147 base pairs of DNA wrapped around an octamer of histone proteins, play a role in gene regulation and cellular function by controlling access to the genetic information stored within DNA. The placement and movement of nucleosomes along strands of DNA is determined, in part, by the presence of poly-A tracts, which are overabundant in eukaryotic genomes. These poly-A tracts exclude nucleosomes in a length and purity dependent manner. We have previously shown that A-tracts adopt unique structures that are preferentially stabilized by specific monovalent cations. The exclusion of nucleosomes by these long A-tracts, greater than 15 base pairs, impacts the accessibility of nearby DNA. The equilibrium accessibility of DNA within the nucleosomes, determined by unwrapping and rewrapping rates, is also an important factor in regulating DNA dependent processes. The impact of short A-tracts, 6-8 base pairs, on nucleosome dynamics is poorly understood. Using competitive reconstitution and equilibrium FRET measurements in the presence of different monovalent cations, we have investigated how the length and placement of short A-tracts within the nucleosome affects the formation and equilibrium accessibility of the nucleosomes. We demonstrate that the same cations that stabilize the unique A-tract structure exacerbate the effects of A-tracts on nucleosome stability and equilibrium accessibility.

D.U.25 Management Strategies for Reduction of Total Hip Replacement Readmission Rates

Brooklyn Radtke
Mentor: Uzay Damali, Management

Total hip replacements are common and expensive procedures within the United States healthcare system. Each year, U.S. hospitals perform nearly 2.4 million hip replacement surgeries. Approximately 4% of patients who undergo surgery are readmitted after 30 days, and approximately 7% are readmitted after 90 days. The estimated patient cost of being readmitted after a hip replacement surgery ranges from $15,000 to $18,000, which totals to a nationwide economic burden upwards of $477 million annually. I am researching what can be done from a management perspective to reduce readmission rates and, consequently, readmission costs. There is a financial motive for administrators to reduce readmissions due to the Hospital Readmissions Reduction Program (HRRP), which was created when the Affordable Care Act was signed in 2012. This program reduces government funding for hospitals with excessive amounts of readmissions for various procedures, including hip replacements. The project summarizes information gleaned from available literature and interviews that I conducted with healthcare professionals working in two prominent La Crosse-area hospitals. My conclusions aim to identify best practices for health professionals working with hip replacement surgeries and to make recommendations for hospitals that may be experiencing higher-than-average readmission rates.

D.U.26 Social Media and Mental Health

Sam Reinke
Co-author: Katherine Kortenkamp
Mentors: Katherine Kortenkamp and Kevin Zabel, Psychology

During the past 10 years, social media has played a larger role in how people communicate with each other. Social media has created a new virtual community where ideas are exchanged between people in an online space and has replaced many other forms of communication. Most recently, millions of people turned to using social media to stay in touch with friends and family during the 2020 COVID-19 Pandemic lockdowns. While more and more people are turning to social media for communication, more college students have been diagnosed with depression and anxiety. Since social media applications are relatively new, research has begun to look into the relationship between social media usage, depression, and anxiety in college students. For this project, college students will complete an online survey assessing their behavioral tendencies on social media. Specifically, students will report their time spent on TikTok, Snapchat, and Instagram, their motives for using social media, and levels of social comparison on social media. Furthermore, students will be screened for depression and anxiety symptoms. Data analyses will examine the hypothesis that time spent on social media predicts depression and anxiety in college students.

D.U.27 Effect of Aripiprazole on Leukemia-Inhibitory Factor (LIF) and the Epstein-Barr Virus

Madeline Ross
Mentor: Kelly Gorres, Chemistry & Biochemistry

The Epstein-Barr Virus (EBV) is one of the most widely spread viruses worldwide, with most individuals contracting the virus at one point or another. The EBV is in the lytic cycle when the virus is replicating its genome and spreading to other cells, whereas the latent cycle is when the EBV only makes enough copies of its genome to survive, not necessarily to infect other cells. The BZLF1 gene determines if the EBV lytic cycle was activated. Atypical antipsychotics, like Clozapine and Aripiprazole, reduce the ability of the EBV virus to express BZLF1. By treating EBV infected cells with Aripiprazole, we can see the effects on the BZLF1 gene and host cell genes. We will compare to the expression of the BZLF1 viral gene with the expression of the leukemia-inhibitory factor (LIF) cellular gene. Cellular genes are needed to initiate BZLF1 expression, which is why we are looking at LIF to see if its expression is associated with the EBV and BZLF1 expression. LIF and its associated receptors appear to be expressed in various types of cancers. Since the EBV is also associated with cancers, LIF could be an indicator of the disease. We will also determine if the markers signaling EBV replication occurs in the beginning stages of the lytic cycle, or if they happen later. From these experiments, we will be able to determine if the LIF gene plays a role in controlling or signifying the status of the EBV lytic cycle, which could open the way for further similar markers to be discovered.

D.U.28 Determining the Survivability Parameters of Mirror Satellites

Jardon Schlieckau
Mentors: Shauna Sallmen and Seth King, Physics

In the circumstance where a planet is tidally-locked it means that one side of the planet is constantly facing the sun whilst the other side is in perpetual darkness. An intelligent civilization could then attempt to expose the dark side of the planet through the use of orbiting mirror satellites that reflect light from the star onto the planet below. This light, or radiation would also exert a force on the mirrors and cause them to drift away from their gravitational orbits, jeopardizing their long-term survivability. Our research tests the survivability of these mirror satellites through the use of computer simulations in a variety of situations. We vary star type, the period during which radiation from the star impacts the mirror, the distance between the planet and satellite, and the orientation of the orbit. We showed that lower luminosity stars, radiation affecting the satellite only when the satellite is above the night side of the planet, and a smaller distance between the mirror and planet were more conducive to mirror survivability. These in addition, satellite orbit orientation of -XY, meaning the satellite is on the same orbital plane as the planet yet traveling in the opposite direction than the planet, tended to produce the longest mirror satellite survivability. The observed trends in mirror satellite survivability and how the aforementioned variables affect one another will be presented.

D.U.29 How Do You Perceive Others? Individual's Motivations to Control Prejudicial Reactions

Petar Lazic and Stevan Lazic
Co-author: Kevin Zabel
Mentor: Kevin Zabel, Psychology

Previous research indicates that prejudiced behavior is impacted by both the automatic activations of racial attitudes as well as motivation to control prejudicial reactions. In this study, college student participants from the SONA pool completed an online survey in a laboratory setting. The purpose of this study is to provide a greater understanding of individuals' impressions of a certain group or individual targets and how they are related to different components of motivation to control prejudicial reactions. Participants were asked to complete several scales or questionnaires consisting of self-consciousness, metacognitions, motivations to control prejudiced reactions, and internal and external motivation to control prejudice. Then, participants were presented with a series of pictures containing group and individual images of White or Black targets, assessing them based on various trait inferences. Finally, participants were asked to report their political standing on certain topics. Data analyses will test the primary hypotheses that an individual high in restraint motivation will rate black target individuals more favorably. On the other hand, an individual high in concern motivation will rate black target groups more favorably. The results from data analyses will provide an explanation as to which persons will behave more positively towards certain target groups or individuals.

D.U.30 The Relationship between the Army Combat Fitness Test and Laboratory Measurements of Fitness

Rachel Schmitt
Co-authors: Makenna Carpenter, Anna Jacobson, Adriana Marquardt, Thomas Gus Almonroeder (Trine University), Andrew Jagim (Mayo Clinic Health System), Joel Luedke (Mayo Clinic Health System), and Ward Dobbs
Mentor: Ward Dobbs, Exercise & Sport Science

The Army Combat Fitness Test (ACFT) is a testing battery utilized to evaluate physical fitness capabilities of military personnel. PURPOSE: The purpose of this study was to evaluate the association between ACFT scores and laboratory measurements of fitness METHODS: Thirteen Reserve Officers' Training Corp (ROTC) cadets performed a series of countermovement jumps (CMJ), followed by two maximal isometric mid-thigh pulls (IMTP) on portable force plates to determine explosive power, followed by a Wingate test involving maximal-effort cycling for 30-seconds, at a load of 7.2% of body mass to determine anaerobic capacity during a single day of testing. Cadets also completed body composition testing and a graded exercise test on a motorized treadmill to determine aerobic capacity ($\dot{V}O_2$ peak) on a separate day of testing within two weeks of participants completing the ACFT. RESULTS: Results indicated CMJ, VO_2 peak, percent fat, and mean power were significantly associated ($P < 0.05$) with the ACFT score ($r \geq 0.727$). Maximal strength via IMTP had a strong association with the standing power throw, deadlift, and sprint drag carry. CONCLUSION: Our results suggest higher explosive power, relative aerobic and anaerobic fitness, along with lower body fatness are associated with a better overall ACFT performance score.

Oral Session A1
8:50 am-9:15 am

O.U.2 Jewish Immigration to La Crosse, WI during Early 20th Century Russian Persecution

Katie Cox
Mentor: Penelope Hardy, History

In Russia of 1881, the first wave of violent pogroms began against Jewish inhabitants. Not much later, in 1903-1906, another wave occurred during the Russo-Japanese War and the Revolution of 1905. These waves of Jewish persecution led roughly one and a half million Jewish people to immigrate to the United States in the span of thirty years. It was not uncommon for Jewish people to settle into towns and cities in the Midwest as some had relatives already living there. Therefore, there is a historical record of Jewish settlement occurring in the early 1900s in the specific region of La Crosse, Wisconsin. While much research has been done on Jewish immigration following Russian persecution, less has been done on the region of La Crosse, Wisconsin. My research seeks to understand why Russian Jews decided to immigrate, why some decided to come to La Crosse, what Jewish communities looked like in La Crosse in the 1900s-1910s, and the discrimination that took place once Jewish immigrants came. This research will be aided by oral histories of Jewish individuals who immigrated as well as the 1970s La Crosse Jewish historian Myer Katz. The goal is to create a conversation of empathy and understanding, especially as Jewish immigration of the early 1900s established a Jewish community that is still thriving in La Crosse today.

Oral Session B1
9:55 am-10:20 am

O.U.5 Machine Learning Madness: A Survey of Machine Learning Techniques on NCAA Men's Basketball Game Predictions

Sean Floersch
Co-author: Chad Vidden
Mentor: Chad Vidden, Mathematics & Statistics

The purpose of the current study was to analyze different machine learning methods to predict NCAA Men’s Division I Basketball games in the regular season and in the March Madness Tournament using personally created metrics and Vegas projections. 3147 regular season games are predicted from the 25 of November 2022, to the 11 of March 2023. 67 March Madness games from March 17 to April 10 of 2023 are also predicted. Logistic regression, support vector machines, gradient boosting machines, neural networks, random forests, and ensembles were used as machine learning techniques. The training set was all previous games to apply to the daily games as a test set. Variables used in the analysis include personal Team Strength, Schedule Rating, and Conference Strength, as well as the Vegas Odds. The analysis found a top machine learning technique to be the ensemble method at 72.9%, followed by logistic regression and random forest at 72.5% and 72.3%. The Vegas book odds were 72.7% as a “golden” baseline, although none of the differences were significant. March Madness predictions will be the key discussion.

Oral Session B2
10:25 am-10:50 am

O.U.7 The Coon Creek Watershed: A Revolution in Soil Conservation

Matthew Kohl
Mentor: Penelope Hardy, History

In October 1933, the U.S. Soil Erosion Service, the University of Wisconsin, and a band of local farmers joined together to create the first large-scale land and water conservation effort in the United States. A study done by the Soil Erosion Service in 1934 revealed that 51,465,000 acres of U.S. farmland had been destroyed by wind and water erosion. The election of Franklin D. Roosevelt put soil and water conservation at the forefront of policy making, becoming a major

part of New Deal projects and programs. Nearly a quarter of the United States population was employed or engaged in agricultural work during this time period. West-central Wisconsin was no different. Less than a month after the creation of the Soil Erosion Service, it began working on what would be called the Coon Creek Watershed. The watershed encompasses an area of over 90,000 acres in Vernon, La Crosse, and Monroe Counties. Few historians have engaged with this project. We thus have an incomplete understanding of the work that went into it, the people involved, and its impact on agriculture. This presentation will elucidate our nation's first large scale soil conservation demonstration, examining farmers' relationships with the land prior to and following the soil demonstrations performed in the Coon Creek Watershed.

Oral Session C2
11:30 am-11:55 am

O.U.9 Pursuing Platinum: An Analysis of Madison, WI Bike Policy through the Advocacy Coalition Framework

Ryan Sperling
Mentor: Regina Goodnow, Political Science & Public Administration

This research paper explores how Madison, WI received a Platinum rating with the League of American Bicyclists by applying the Advocacy Coalition Framework (ACF). As an increasing amount of studies confirm the economic, health, and environmental benefits of biking, more and more cities are turning to bicycle networks to counter a variety of urban dilemmas. Madison, WI was awarded a Platinum "Bicycle Friendly Community" rating with the League of American Bicyclists in 2015. This rating has been upheld as recently as 2019, making Madison one of only five cities in the U.S. to receive this esteemed Platinum rating. Through a case study approach, the paper analyzes the factors that contributed to Madison's success in achieving a Platinum rating, including the formation and activities of advocacy coalitions, the policy beliefs and goals of key actors, and the role of external factors such as funding and public opinion. By applying the ACF to this case study, this research aims to provide insights into the dynamics of policy change related to bicycle infrastructure. Ultimately, the paper argues that the success of Madison's bicycle-friendly policies can be attributed to a diverse coalition of actors, including city officials, community advocates, and bicycling organizations. The paper concludes by drawing lessons for other cities seeking to enhance their bicycle infrastructure and highlights the potential benefits of using the Advocacy Coalition Framework to analyze policy change in complex systems.

Oral Session D1
12:05 pm-12:30 pm

O.U.11 Estimations, Ambitions and Achievements: An Examination of Parental Factors and Their Effect on Students Educational Aspirations and Attainment

Mikaela Schneider
Mentor: Nicholas Bakken, Sociology & Criminal Justice

The impact that parental socialization has on a child cannot be understated, particularly as it relates to a child's educational experiences and outcomes. Research has thoroughly explored the relationship between parental factors, such as socioeconomic status and education-level, and their child's level of educational attainment as an adult. What is less understood, however, is what factors are most important in explaining the disparity between educational aspirations in relation to the actual education that a student completes. Utilizing data from the Youth Development Study, this study seeks to identify the relationship between students` educational aspirations in high school to their actual educational attainment collected at age thirty. Analyses will examine the difference between educational aspirations and actual attainment and which factors influence both. The Youth Development Study is a longitudinal panel survey that collected data from both parents and their children (N=1,010). Path analysis was used to identify the direct effect of educational aspirations on educational attainment while controlling for other demographic and structural factors. The results indicate that parental aspirations and education level, along with specific individual level demographic measures, had the strongest effect on a child's educational attainment. The implications related to familial and educational policy will be discussed.

O.U.12 Prohibition in La Crosse: Making a Thriving Industry Illegal

Jared Brinkman
Mentor: Penelope Hardy, History

In an era characterized by attempts to reform the union from crime, corruption, as well as a desire to improve the overall health and morality of the public, the temperance movement became an increasingly popular idea. Alcohol was blamed not only for the problems in health and crime, but also in family life. In La Crosse, a city with a bright future and a thriving alcohol business, the culture of drinking seemed embedded into the town's identity. When made illegal, the workers in the industry had to adjust their way of life to avoid financial ruin. This paper analyzes the role of La Crosse laborers in the alcohol industry during prohibition. The changing times and attitudes of the civilians as well as the challenges shops, taverns, and major breweries faced will be documented. Gender roles in labor will also be explored, seeing how men and women were treated differently in the industry. Through oral histories and business records, a town's identity struggled to survive and adapt when its economic powerhouse was taken away.

O.U.13 Determining the Functional Role of the GOX1969 Protein in *Gluconobacter oxydans*

Ky Ariano
Mentor: Paul Schweiger, Microbiology

Acetic acid bacteria are used in many industrial processes (vinegar, vitamin C, antidiabetic drug miglitol production, etc.). These industrially important reactions are mainly done by an arsenal of membrane-bound dehydrogenases that shuttle electrons directly into the respiratory chain. Among these dehydrogenases, GOX1969 in *Gluconobacter oxydans* was predicted to be a PQQ-dependent dehydrogenase of unknown function. However, dehydrogenase activity has not been detected after multiple analyses by a number of labs. Reanalysis of the protein sequence reveals similarities to the BamB protein that functions as a subunit of the **β**-barrel assembly machine (BAM) complex that is responsible for the assembly of **β**-barrels in the outer membrane of gram-negative bacteria. To test if the actual physiological function of GOX1969 is as the BamB subunit of the BAM complex, we introduced the *gox1969* gene into an *Escherichia coli* K12 mutant that lacks BamB. Growth deficiencies in the mutant lacking BamB were restored when *gox1969* was expressed on the plasmid pBamB. This provides the first evidence that GOX1969 is functionally acting as a BamB in *G. oxydans*. Functional information of uncharacterized genes will provide new insights that will allow a more accurate modeling of metabolism and more rational strain design.

Oral Session D2
12:35 pm-1:00 pm

O.U.14 Inclusion's Limits: Layshia Clarendon's Presence (or Lack Thereof) in the WNBA

Clara Hance
Mentor: Eileen Narcotta-Welp, Exercise & Sport Science

This research examines Layshia Clarendon, the first player in the Women’s National Basketball Association (WNBA), who publicly identifies as transgender and non-binary. While the WNBA positions themselves as an inclusive and accepting league, examining Clarendon’s position within the league allows for a different perspective. Despite their veteran point-guard status and recent career-high scoring, they have been shuffled between WNBA teams and ultimately absent from the entire 2021 season. Through Clarendon’s public gender identity and their outspoken activism, I will use Michael Messener’s theories on the gender binary to exemplify how it is being reproduced for Clarendon. Moreover, I will use Jack Halberstam’s Queer Art of Failure to demonstrate how the WNBA positions themselves as a space for greater liminality but fail through their toxic positivity and lack of inclusion to Clarendon, who exists outside of the traditional gender binary.

O.U.15 Parts That Make a Hole: An Analysis of Usewear and Microwear on Oneota Lithic Drills

Louden Ferguson
Mentors: Constance Arzigian and Heather Walder, Archaeology & Anthropology

Stone drill bits are a common artifact type from Oneota archaeological sites in the La Crosse area from about AD 1300-1650. These artifacts can provide insight into differences in use between sites, as influenced by season of occupation, period of occupation, and available materials. To discover how people of the Oneota culture used these drills, experimental replicas were created and utilized on six materials: antler, bone, shell, wood, dry hide, and wet hide, to be analyzed for reference. Using these reference replicas and images, artifactual drills from four Oneota archaeological sites were examined at magnifications of 50x, 100x, and 200x to look for traces of use and material residues. This investigates drill use in Oneota sites to find whether peoples' practices changed over the period of occupation in the La Crosse locality and whether their use changed between warm season and cold season occupations. I expect to see little difference in use between sites over time; however, I hope to find differences in use between cold season and warm season occupations.

O.U.16 Cytosolic Rap1b Promotes Megakaryocytic Apoptosis

Emily Richards
Mentor: Jaclyn Wisinski, Biology

Megakaryocytes are highly regulated hematopoietic stem cells that are responsible for the production of platelet, the main factor in blood clotting. A small G protein called Rap1b is believed to be associated with megakaryocytic apoptosis and help mediate cell survival. Rap1b acts as a molecular switch with GDP-bound inactive state and a GTP-bound active state. The cellular location of Rap1b is dependent on the state of a cAMP-dependent protein kinase. Rap1b typically exists in an unphosphorylated state at the cell membrane and will detach after phosphorylation to exist in a cytosolic state. A megakaryocytic cell line was used to determine the influence of Rap1b location on cell survival. We hypothesize that the unphosphorylated state of Rap1b leads to a higher frequency of cell death. DAMI cells were exposed to an apoptosis inducing drug, ABT, and stained to observe caspase activity. Upon analysis, it was determined that a strain containing a mutation preventing phosphorylation in Rap1b had a similar frequency of caspase activity when left untreated and treated with ABT and was more likely to undergo induced cell death without treatment than other cell lines. This suggests cellular location of Rap1b does influence the frequency of apoptosis in DAMI cells.

GRADUATE STUDENT ABSTRACTS

Poster Session A
8:50-9:45 am

A.G.33 Best Choice of Fluids in Diabetic Ketoacidosis: An Applied Research Inquiry

Abigail Aguirre and Miles Saylor
Mentor: Karen Hayter, Health Professions

Diabetic ketoacidosis (DKA) is a state of anion gap metabolic acidosis due to insulin deficiency leading to ketone body formation. Normal saline (0.9% NS) is the most commonly used resuscitation fluid in the treatment of patients with DKA. Saline is more acidic than blood plasma and has been associated with hyperchloremic metabolic acidosis when large volumes are infused. In theory, an infusion of saline could delay the resolution of DKA. Balanced electrolyte solutions (BES), an alternative fluid choice, are more comparable to blood plasma in pH and electrolyte composition. It is hypothesized that these solutions could provide a quicker time to the resolution of systemic acidosis seen in DKA, compared to normal saline. Reputable medical research databases were searched to find studies investigating the differences in fluid choice in the treatment of DKA. Randomized controlled trials involving the treatment of adults with DKA in the emergency department or intensive care unit showed a possible decrease in the time to resolution of DKA when using BES versus saline. The use of BES is comparable in price, accessibility, and risk of adverse side effects and its use can possibly reduce the overall time that a patient with DKA remains in the hospital. Although further studies are needed to confirm the results, there is sufficient data to recommend the use of BES over NS in the treatment of DKA.

A.G.34 Effect of Initiation of Low Intensity Aerobic Exercise in Young Adults with Sport-Related Concussions

Emily Bartig and Madissen Burns
Mentor: Karen Hayter, Health Professions

Sports-related concussions (SRC) are one of the most common sport related injuries. SRCs are usually self-limited and will resolve in 7 to 10 days but there is the possibility of harmful consequences if they are not managed correctly. The gold standard protocol for sport-related concussions has historically involved strict physical and cognitive rest followed by a gradual return to sport. However, in recent years there has been limited evidence for the use of strict rest. Instead, there has been increasing support for initiation of aerobic exercise earlier in concussion management. In this case, we have a 20 y/o male with a SRC who desires a recommendation for treatment. For this applied research, we conducted a comprehensive peer-reviewed literature search. Based on our findings, current literature suggests that aerobic exercise significantly decreases Post-Concussion Symptom Score (PCSS) and percentage of patients with symptoms compared to the control (rest) in patients with SRCs. Additionally, earlier initiation of aerobic exercise after an acute SRC was associated with a faster return to sport and school/work. However, the current literature lacks conclusive high quality evidence in support of either rest or aerobic exercise. Therefore, we recommend that the decision to incorporate aerobic exercise in concussion management of young adults be based on the discretion of the provider and the individual being treated.

A.G.35 Pharmacological-Electrical versus Electrical-Only Approach to Cardioversion of Acute Atrial Fibrillation

Joseph Bierbaum, Abigail Rudolph, and Hannah Janzig
Mentor: Karen Hayter, Health Professions

Atrial fibrillation (AF) is the most common cardiac arrhythmia worldwide, with risk factors such as age, obesity, and hypertension. The electrical abnormalities that occur during atrial fibrillation can cause thrombosis leading to stroke or heart failure. Two common approaches to treating AF include pharmacological and electrical cardioversion. In this study, we investigated the efficacy of pharmacologic cardioversion before electrical cardioversion compared with only electrical cardioversion on restoring patients to normal sinus rhythm (NSR). After analyzing five peer-reviewed literature sources pertaining to a middle-aged male with obesity, we found that both methods were safe, rapid, and effective in restoring NSR. Further analysis showed that pretreatment with amiodarone improved the outcome of electrical cardioversion and decreased the rate of recurrence of AF. Additional studies demonstrated a decrease in efficacy of solely using electrical cardioversion in obese patients. Because of the history of obesity in this patient, we recommend that amiodarone should be used as pre-treatment in conjunction with electrical cardioversion for the best patient outcome.

A.G.36 Can Lifestyle Interventions Effectively Treat GERD? An Applied Research Study

Allison Cadden and Nathanael Shull
Mentor: Karen Hayter, Health Professions

Gastro-esophageal reflux disease (GERD) is a chronic medical condition affecting around 20% of the US population (Commisso and Lim, 2019). With such a high disease-burden, it is important to determine the best treatment methodologies. In this study, we determine the best treatment modality for GERD in a senior male. We performed a literature search using PubMed, Medline, Cochrane Review System, and Google Scholar for our applied research study. Literature highlights three primary modalities for the treatment of GERD: lifestyle, pharmacological, and surgical interventions. Recent literature suggests that lifestyle interventions, including weight loss, dietary and activity modifications, and posture modifications can be effective in alleviating symptoms as a first-line intervention. The gold standard for pharmacological management is a proton-pump-inhibitor (PPI). Our treatment recommendation to our patient is a 6-month trial of lifestyle modifications with reevaluation of symptoms at trial's end. If lifestyle modifications prove insufficient, we recommend initiating an 8-week trial of an on-demand PPI use. If PPI use fails, surgical management may be considered.

A.G.37 Building a Better S.E.L.F.

Nicole Goodwin
Mentor: Lindsey Kirschbaum, Recreation Management & Therapeutic Recreation

With the differences in behavioral and intellectual approaches for children diagnosed with ASD, expressive arts as an intervention have been proven effective to enhance communication skills, increase resistance to peer pressure, encourage self-perception, and increase self-esteem. Self-esteem is defined as, "the degree to which one feels a sense of self-worth" (Devine and Dawson 2010). Building a Better S.E.L.F. is an eight-day expressive arts program designed for children aged 5-9 years diagnosed with Autism Spectrum Disorder (ASD) admitted into an inpatient psychiatric hospital. The goal of this evidence-based curriculum is to increase self-esteem utilizing research and statistics. To meet this goal, the program will utilize the Self Determination Theory as a theoretical framework to measure the outcomes specific to the components of relatedness, competence, and autonomy. The Perceived Choice and Awareness of Self Scale (PCASS) assessment will be implemented to record patient progress prior to participating in program and directly after completion. If the patient successfully meets the goals that are associated with each individual program session, then it can be proven through assessments that the patient has reached self-determination, which increases overall self-esteem. Through Individualized client goals and interests, Building a Better S.E.L.F. enhances overall quality of life allowing individuals to express themselves in alternative outlets of communication.

A.G.38 The Effects of NPH versus Long-Acting Insulin on HbA1C Levels in Adults with Uncontrolled Type 2 Diabetes Mellitus over Six Months

Ellie Hall and Katherine O'Connell
Mentor: Karen Hayter, Health Professions

Individuals with uncontrolled type 2 diabetes mellitus (T2DM) often require multi-medication therapies and lifestyle modifications to maintain glycemic control. Patients with resistant HbA1C levels that continue to climb despite multiple oral hypoglycemic medications often require a basal insulin as the next step in pharmacologic therapy. There is currently insufficient evidence determining whether the implementation of a long-acting insulin is more effective in lowering HbA1C levels than an intermediate acting insulin, NPH. The purpose of this study was to identify the effectiveness in NPH insulin versus long-acting insulin in individuals with uncontrolled T2DM over 6 months. To answer our question, we searched the Cochrane Library since it is considered to be an established, reputable source containing high-quality systematic reviews. We also searched PubMed, which is a massive, reliable, authoritative resource that is specific to medicine. Overall, medical literature suggests that there is no significant difference in NPH versus long-acting insulin treatment on HbA1C levels in patients with T2DM. However, NPH insulin is associated with an increased risk in hypoglycemic events compared to long-acting insulin. Either insulin therapy can adequately lower HbA1C levels, however individuals susceptible to hypoglycemia may benefit from a long-acting therapy over NPH.

A.G.39 Growing Minds: An Evidence-Based Curriculum for Increasing Self-Awareness Skills Utilizing Mindfulness-Based Interventions

Peri Kasanders
Mentor: W. Thomas Means, Recreation Management & Therapeutic Recreation

Through extensive research on adolescents with a mental health diagnoses and mindfulness-based interventions; there is a large gap in literature and research on this focus area. Growing Minds is an evidence-based curriculum that consists of eight, 50-minute session which utilize mindfulness-based interventions to increase self-awareness. The program is designed for inpatient adolescents ages 13-17 years old, receiving mental health services. Growing Minds utilizes the self-fulfilling prophecy theory as the foundation. Specific activities are designed based off this theory to accomplish the overarching goal of increasing self-awareness in adolescents with mental health diagnoses. Growing Minds focuses on a variety of mindfulness-based activities to implement mindfulness into the patients' daily lives. Adolescents with mental health conditions often utilize a variety of coping skills, however, not many individuals utilize mindfulness-based activities to increase their well-being. The therapeutic benefits of mindfulness are achieved through a variety of activities/interventions which are individualized based on the person's age, development, and personal needs. Mindfulness-based interventions for adolescents have been proven to show improved self-awareness, increased interpersonal skills, increased executive functioning, increased emotional regulation, enhanced interpersonal relationships, and reducing anxiety and stress.

A.G.40 Rising to The Top: An Evidence-Based Curriculum for Adolescents Diagnosed with a Mental Health Disorder

Hannah Ketterhagen
Mentor: Tara DeLong, Recreation Management & Therapeutic Recreation

At least one in five adolescents from the ages of nine to 17 are currently diagnosed with a mental health disorder and only one-third of adolescents diagnosed with a mental health disorder will receive the necessary treatment.[1] Research states adolescents with a mental health disorder are affected in all domains of life, but specifically, experience decreased self-efficacy levels.[1] Bibliotherapy interventions are proven to help increase self-efficacy levels through various approaches.[2] Bibliotherapy is an adaptable therapeutic approach consisting of reading, expressive writing, journaling, and more. Each aspect of bibliotherapy involves a need for creativity, confidence, trust in yourself/others, and vulnerability to the truth.[2] This evidence-based curriculum, Rising to the Top (RTT), utilizes Bibliotherapy as an intervention to increase self-efficacy levels in adolescents diagnosed with a mental health disorder. The participants will complete the Self-Esteem Scale (SET) before and after the program which examines their levels of self-esteem. This assessment, along with the Self-Efficacy Theory provided the framework for the development of RTT. The Self-Efficacy Theory recognizes four factors of self-esteem: performance or sense of mastery, vicarious experience, verbal persuasion, and psychological arousal which correspond to increasing self-efficacy. To conclude, RTT will work towards increasing self-efficacy levels in adolescents within a psychiatric facility by utilizing bibliotherapy.

A.G.41 Treatment of Pulmonary Embolism within Elderly Patients: Warfarin vs DOAC

Marissa Kinsman and Karlee Curtis
Mentor: Karen Hayter, Health Professions

Pulmonary embolism (PE) is an obstruction of the pulmonary artery or one of its branches by a blood clot that is a significant cause of morbidity and mortality in elderly patients. There are a myriad of options for treating pulmonary embolism, with oral anticoagulants being a major category. Of these medications, conventional treatment is warfarin, an oral anticoagulant. A newer class of medications have been developed called Direct Oral Anticoagulants (DOACs), of which there are two varieties, Oral factor Xa inhibitors and Direct Thrombin Inhibitors (DTIs). Our applied research regarding elderly men with PE, cardiac risk factors, and pneumonia seeks to elucidate whether or not there is a significant treatment benefit in the use of warfarin compared to DOACs. Numerous databases were searched and appropriate data was collected and assessed. Our results found no significant difference in the efficacy of warfarin when compared to DOACs. For this clinical situation, we recommend DOACs for their superior safety, lack of laboratory monitoring, and association with shorter hospital stays.

A.G.42 Treatment Benefits of Interleukin-1 Antagonists Compared to NSAIDs and Colchicine in Patients with Pericarditis

Danielle Koziczkowski and Cooper Jackson
Mentor: Karen Hayter, Health Professions

Pericarditis is the inflammation of the protective pericardial sac that surrounds the heart. It is diagnosed through the presence of a pericardial friction rub, substernal chest pain, diffuse ST-segment elevations, and the new onset of a pericardial effusion. This inflammatory process is quite common worldwide and has traditionally been treated with a combination therapy of non-steroidal anti-inflammatory drugs (NSAIDs) and colchicine. Although this treatment is quite effective at relieving symptoms, anywhere between 15 and 50% of patients have recurrent episodes. This has sparked an in-depth look at the use of interleukin-1 (IL-1) receptor antagonists as an alternative measure to treat this disease. Interleukin-1 is a cytokine released to recruit other inflammatory mediators. Blocking this receptor reduces recruitment and limits inflammation. After conducting an analysis of the most recent systematic reviews and randomized control studies on the effectiveness of these drugs, it was concluded that IL-1 antagonists such as Anakinra and Rilonacept are extremely effective in not only treating pericarditis but preventing recurrences. Despite the efficacy of these drugs, we do not recommend their use as first line treatment due to the need for higher quality studies, the financial burden placed on patients, and the potential side effects. However, IL-1 antagonists remain a viable alternative in recurrent and refractory cases.

A.G.43 Play: A Piece of Engagement: A Therapeutic Recreation Curriculum for Engagement in Older Adults Diagnosed with Dementia Living in Skilled-Nursing Facilities

Jenna Marose
Mentor: Jennifer Taylor, Recreation Management & Therapeutic Recreation

Older adults diagnosed with dementia residing in skilled-nursing facilities often experience loneliness due to social isolation. Feelings of loneliness and social isolation are seen as a public health issue for older adults, with negative impacts on physical, cognitive, and mental health. Play: A Piece of Engagement is an evidence-based therapeutic recreation curriculum that uses therapeutic play to increase social engagement among older adults diagnosed with dementia living in skilled nursing facilities. Engagement, the real-life activity that results from association with one's social ties, is important in reinforcing existing social relationships and provides a sense of value and identity. Research suggests that activities, especially when meaningful, help older adults replace lost life roles after retirement, and, therefore, resist the social pressures that limit an older adult's world. The curriculum uses the Activity Theory framework developed by Havighurst. Older adults with dementia who participate in therapeutic play interventions may decrease social isolation through social engagement. The curriculum will be implemented in-person during 20-minute sessions, twice a week for eight weeks by a Certified Therapeutic Recreation Specialist (CTRS) in a skilled-nursing facility. The Mini-Mental State Examination (MMSE) will determine inclusion criteria and the Engagement of a Person with Dementia Scale (EPWDS) will measure engagement using a repeated measures design.

A.G.44 The Influence of Olympic Weightlifting Derivatives on Sprint Performance

Emma Malooly
Co-author: Ward Dobbs
Mentor: Ward Dobbs, Exercise & Sport Science

Purpose: The purpose of this study was to investigate if jump shrugs performed as a conditioning activity (CA) would influence 30-meter sprint performance in collegiate sprinters. Methods: Sixteen collegiate sprinters, men (n=6) and women (n=10), participated in this study. All participants performed 3-5 sets of jump shrugs on a set of force plates to determine the load that produced the highest power output, which served as the CA during sprint sessions. Then, participants were randomized into two groups. During trial one, Group A performed the CA followed by 30-meter sprints, while Group B did not perform the CA prior to sprints. Trial two was performed 1-week later in a counterbalanced manner, as both groups altered their warmup (CA or non-CA). Timing gates were used to collect sprint times. Paired and independent T-tests were used to determine effect of CA on sprints, and between sex respectively. Results: There was a non-significant effect for CA on sprints overall (P=0.276), but the CA elicited a significantly different (P=0.028) response for men (-1.4 ± 1.4%) vs. women (+0.2 ± 1.1%). Conclusion: Performing jump shrugs prior to a sprint does not elicit a beneficial response and may be less favorable for men compared to women.

A.G.46 Microplastic Characterization in Three Fish Species Collected from Pools Four and Eight of the Upper Mississippi River

Samuel Munk
Co-author: Eric Strauss
Mentor: Eric Strauss, Biology

Microplastics can cause a variety of negative health effects in the organisms that consume them, from changes in feeding habits to increased exposure to toxic chemicals. In this project, microplastic pollution was assessed in three fish species collected in 2019 from Pools 4 and 8 of the Upper Mississippi River. Digestive tracts of Emerald Shiners (Notropis atherinoides) (n=89), Yellow Perch (Perca flavescens) (n=97), and Shorthead Redhorse (Moxostoma macrolepidotum) (n=95) were removed for microplastic analysis. Tissue and contents were digested, density separated and filtered for enumeration. Microplastics were counted and identified, and subsamples were verified via Raman Spectroscopy at UW-Eau Claire. In total, 891 microplastic particles were found among the 281 fish individuals and ranged from 0-22 particles per fish. Between the three species, Emerald Shiner contained significantly more microplastic particles than both Shorthead Redhorse and Yellow Perch ($p < 0.05$). Microplastic content of fish decreased as fish length (mm) increased ($p < 0.05$). In addition, smaller fish tended to contain proportionately more microplastics than larger fish (microplastics per mm fish length) ($p < 0.05$). This research confirms microplastic ingestion by UMR fish and highlights the need for further microplastic pollution monitoring in the UMR system.

A.G.47 Treatment of Breastfeeding Insufficiency Jaundice

Anna Navratil and Stephanie Bruxvoort
Mentors: Karen Hayter, Health Professions, and Ann Emmel (Gundersen Health System)

Neonatal hyperbilirubinemia, the accumulation of unconjugated bilirubin due to lack of liver enzyme development, is a common condition experienced by newborns that causes yellowing of the skin (jaundice). Serious long term sequelae of untreated hyperbilirubinemia include encephalopathy and kernicterus, which are rare. Etiologies range from physiologic to pathologic, with one of the most innocent and easily treatable being breastfeeding insufficiency. In the first few days of life, inadequate breastfeeding can lead to insufficient caloric and fluid intake, which worsens hyperbilirubinemia. Our case focuses on a full-term 5 day old infant with hyperbilirubinemia, decreased weight and insufficient urine output whose mother is experiencing inadequate breastfeeding. In our applied research on the treatment options for this issue, we gathered relevant research of systematic reviews and compared evidence-based findings. Treatment for neonatal hyperbilirubinemia is determined by severity and options include light phototherapy, assistance with breastfeeding, IV fluid supplementation, and plasmapheresis. For cases of hyperbilirubinemia due to breastfeeding insufficiency, the most effective treatments include breastfeeding education, augmented breastfeeding and light phototherapy.

A.G.48 An Exploration of Enteral Microbial Supplementation vs Breastfeeding in Preterm Infants for Prevention of Necrotizing Enterocolitis (NEC)

Anna Nick and Syndey Kruisselbrink
Mentor: Karen Hayter, Health Professions

Necrotizing enterocolitis (NEC) is one of the most common gastrointestinal emergencies that targets premature infants. Once diagnosed, it can rapidly lead to rupture of the peritoneum, sepsis, and death. Despite medical intervention, mortality rates remain high. This has shifted research to study preventative measures such as probiotics. A healthy microbiome is thought to be key to prevention. This applied research study compares the rates of NEC in preterm infants that received enteral microbiota supplementation to those that received breastmilk. Cochrane Review database and PubMed were utilized to obtain systematic reviews and RCTs for this study. Literature on this topic is limited by small sample sizes, bias, and varying methodology. The evidence was deemed to be of "low to moderate certainty". Despite these challenges, research has indicated breast milk and enteral microbial supplement can decrease the severity of NEC (RR 0.54, 95% CI 0.45 to 0.65) and NNTB of 33 (54 trials, 10,604 infants; $I^2 = 17\%$), the likelihood of hospital admission, and duration. Furthermore, there has been no documented harm to probiotic supplementation in preterm infants. For this reason, it remains a viable option for prevention but more high quality research is needed to make definitive clinical decisions.

A.G.49 The Acute Effects of Large Amplitude Movements on Function in Adults with Parkinson's Disease

Morgan Ripp, Emily Benitez, Ally Brugler, Katie Krupo, Cassie Newcomer, and Haley Waise
Co-author: John Greany
Mentor: John Greany, Health Professions

Purpose: This study investigated the acute effects of large amplitude movements (LAMs) on gait and functional mobility measures in adults with Parkinson's disease (PD). Subjects: Twelve adults with PD were recruited from a university-based physical activity program. Methods: Participants were assigned to a LAM or control group. Both groups completed an 8-minute warm up, with the control group walking at a self-selected pace and the LAM group performing 8 repetitions of 5 LAMs. Immediately following, functional outcome measures were obtained: Five Times Sit-to-Stand (5XSTS), 360-degree turn, and Timed Up and Go (TUG). In addition, gait variables for self-selected and fast walking were recorded using an electronic walkway sensor mat. Data were analyzed by paired t-tests using SPSS software. Results: No differences were found between groups for functional measures. Gait data showed self-selected and fast velocities were different ($p < 0.001$) between the LAM and control group. Conclusion: This study found that one session of LAMs showed an acute effect on gait velocity. Clinical Relevance: One episode of LAMs has an acute effect on gait in adults with PD. Further research with a larger sample size is required to assess the impact on other measures.

A.G.50 Recommendations for an Elderly Patient with *C. difficile* Infection Following Hospitalization for Community Acquired Pneumonia

Riyah Rudeen and Hailey Wasti
Mentor: Karen Hayter, Health Professions

Clostridium difficile infection (CDI) is one of the most common hospital-acquired infections and is a frequent cause of morbidity and mortality in elderly hospitalized patients. In this applied research study, we investigated the most effective treatment for an elderly patient previously hospitalized with pneumonia. Vancomycin is currently the treatment of choice for severe or complicated cases of CDI, but the preferred treatment for less severe cases is more ambiguous. Fidaxomicin—a novel therapeutic for mild-moderate CDI—was selected as the treatment intervention. We performed a comprehensive peer-reviewed literature search exploring the efficacy and safety of fidaxomicin in patients with CDI compared to vancomycin. While the studies agree that both vancomycin and fidaxomicin are suitable drugs for treating CDI infection, there is moderate-quality evidence suggesting that fidaxomicin may be the superior choice. When reviewing secondary outcomes, specifically the rates of CDI recurrence, it was shown that fidaxomicin is superior to vancomycin in preventing repeat infection of CDI. We recommend that elderly individuals with CDI be treated with fidaxomicin following hospitalization for pneumonia in order to quickly resolve symptoms and prevent recurrence.

A.G.51 Influence of the Relationship between Power Performance and Landing Mechanic Testing on Athletic Testing and Training

Katie Samuelson and Tyler Tatro
Co-authors: Ward Dobbs, Salvador Jaime, Becky Heinert, Drew Rutherford, and Thomas Kernozek
Mentor: Thomas Kernozek, Health Professions

Performance and landing mechanics testing may serve a critical role in athletics aiding in designing effective training and injury prevention programs. Currently, there is little data showing the relationship between performance and injury related variables during jumping and landing tasks especially related to limb asymmetry. The purpose of this study was to determine the relationship between landing ground reaction force (GRF) and peak propulsive GRF symmetry during jump testing. 23 female collegiate volleyball athletes performed dual task drop landing testing, countermovement jumps (CMJ), and non-countermovement jumps (NCMJ)). Drop landing training consisted of trials where athletes were given feedback on the magnitude of GRF, force symmetry and body alignment. Pearson correlation coefficients were performed between performance and injury related variables during jumping and landing. There were moderate relationships between limb GRF asymmetry from drop landing during the pre and post training 1 ($r = .544$) and between peak propulsive force asymmetry during the CMJ and NCMJ ($r = .52$). Relationships between performance related jump and drop landing injury symmetry metrics were small with low coefficient of variation ($r2 < 0.15$). Our findings appear to indicate the task specific nature of these variables such that the performance measures of symmetry during jumping may not be highly related to the injury related symmetry metrics we investigated during drop landing.

A.G.52 Make Something G.R.E.A.T.: An Evidence-Based Therapeutic Recreation Curriculum for Increasing Self-determination in Adults with Intellectual or Developmental Disabilities Through Cooking

Danielle Stewart
Mentor: W. Thomas Means, Recreation Management & Therapeutic Recreation

In recent years, a large emphasis has been placed on promoting self-determination in adults with intellectual and developmental disabilities (IDD) to increase overall well-being. Self-determination consists of three main components: (1) competence or the ability to successfully perform a task, (2) autonomy or feeling responsible for one's own actions, and (3) relatedness or sense of connection to others and the surrounding world. Make Something G.R.E.A.T. is an eight-week evidence-based therapeutic recreation curriculum designed to increase self-determination in adults with IDD through a cooking intervention. Make Something G.R.E.A.T. teaches important skills needed to be competent and autonomous in the kitchen, while encouraging participants to engage in a social cooking environment that promotes relatedness. Therapeutic cooking is a specific intervention that has been proven to have positive effects on adults with IDD, including increased self-determination, perceived skill level, and improved social relationships. Make Something G.R.E.A.T. utilizes a structured approach, starting with basic skills and working up to more technical skills, paired with education about healthy food choices to improve healthy eating habits and cooking competence. Make Something G.R.E.A.T. will assist in the development of self-determination in adults with IDD as well as enhance the field of therapeutic recreation by utilizing evidence-based practices.

A.G.53 Hypothyroidism Treatment: Conventional vs. Combination

Aaron Thompson and Sarah Anderson
Mentor: Karen Hayter, Health Professions

Hypothyroidism is a common chronic disease caused by failure of the thyroid gland to secrete adequate amounts of the thyroid hormones triiodothyronine (T3) and thyroxine (T4). This may lead to several metabolic and neurologic symptoms, such as fatigue, weight gain, depression, cold sensitivity, loss of appetite, dry skin and hair loss. Currently, T4 monotherapy is the standard of care for treating this condition; however, T3/T4 combination therapy is another option commonly used in individuals who fail initial treatment with T4 monotherapy. The objective of this literature review was to determine whether T3/T4 combination therapy is superior at managing symptoms of hypothyroidism as well as thyroid hormone levels compared to the standard T4 monotherapy. The effects of both treatments on psychological symptoms, biochemical health markers, and patient preference were considered. Numerous articles demonstrated no significant differences in symptoms with either treatment. Although thyroid hormone levels varied slightly, this had no clinical significance as it was not reflected in symptoms experienced by the patients. Further research may be needed to determine the clinical significance of combination T3/T4 therapy. Therefore, we recommend that patients are first treated with T4 monotherapy before considering T3/T4 combination therapy as an alternative method for treatment.

A.G.55 Outcomes of University of Wisconsin- La Crosse Occupational Therapy Neurological Support Group

Ashley Agrimson, Miranda Gajewski, Alyssa Kliment, Bella Ruetten, and Maimee Vang
Mentor: Erin McCann, Health Professions

"UWL-OT Neurological Support Group" is a program that will help individuals with neurological disorders in a La Crosse area that will be operated by University of Wisconsin-La Crosse (UWL) Occupational Therapy Students. The objective of this program is to improve their quality of life, well-being, and connectedness by promoting social participation and community engagement. From our needs assessment we saw that there are currently no active neurological disorder support groups in the La Crosse area. This concern was echoed by the high amount of contact information we received in the preliminary needs survey we provided to the community. During the program, participants will meet at four different community locations (Health Science Center at UWL, Myrick Park Eco Center, Black River Beach Community Center, and NASA fishing pond) to participate in activities that promote social participation and education on accessibility within the La Crosse community. We plan to use the Neurological Quality of Life (Neuro-QoL) Satisfaction with Social Roles and Activities-short form and the Neuro-QoL Positive Affect and Well-being short form to measure change. The program's total cost for the duration of our program will total $1,557.49, where we would get $1,079.72 through in-kind donations from local organizations; we are asking $477.74 from the UWL's Research, Service, and Educational Leadership (RSEL) grant to cover the remaining costs.

A.G.56 Health and Happiness at Hillview

Anna Kaminski, Alexa Schroeder, Emily Holzheimer, Amanda Klaeser, Alyssa Swenson, and Sarah Carlton
Mentor: Erin McCann, Health Professions

Our group works to create group-centered programs that promote social participation, healthier lifestyles, and improved quality of life through community engagement activities. We believe that residing in assisted living doesn't need to impact your ability to live a fulfilling life. We are committed to providing an engaging program to facilitate these core values. In recent years there has been a significant decline in social participation among older adults, therefore a program to support this population is needed. By having participants engage in the Health and Happiness at Hillview program, they will improve their quality of life, increase their social participation, and adopt a healthier lifestyle through social participation. The Health and Happiness at Hillview group consists of 6 OT students from UWL that are working to increase the social participation of the residents at Hillview Terrance Assisted Living. This group will be implemented for 5 weeks, each session being between 1-2 hours long. Residents that choose to participate will engage in icebreakers, a different BINGO session every week, and a wrap-up activity. Residents will be provided resources at each session if they would like to reference them in the future to continue to adopt a healthier lifestyle. The primary outcome measure that will be utilized for this program is the Satisfaction with Participation in Discretionary Social Activities PROMIS measure, which will be given pre- and post-intervention.

A.G.57 The Do's and Don'ts of Dating and Dining

Madi North, Brianna Carpenter, Julia DeMain, Kyra Dokken, and Hailey Struzynski
Mentors: Erin McCann and Kim Servais, Health Professions

The Dos and Don'ts of Dating and Dining is a proposed 5-week group program for adults with intellectual disabilities to explore and improve social skills specific to dating and relationships. Involvement in an intimate relationship has significant meaning compared to other relationships in people with intellectual disabilities, yet adults with these disabilities have an incredibly limited range of educational opportunities relating to dating and developing healthy intimate relationships. Because of this, these adults often demonstrate deficits in the social skills required to engage in close intimate relationships. Thus, there is a significant need for increased education and a space to safely learn and explore social skills specific to dating. The Dos and Don'ts of Dating and Dining will be housed in Day Services at Aptiv in La Crosse, WI, which is an organization who has been serving the population of La Crosse for almost 50 years.

A.G.58 Friends, Fun, Food

Brianna Perry, Olivia Griesbach, Katelyn Ihrke, Havala Snyder, and Renee Murphy
Co-authors: Olivia Griesbach, Katelyn Ihrke, Havala Snyder, and Renee Murphy
Mentors: Erin McCann and Brandon McCauley, Health Professions

"Friends, Fun, Food," is a proposed program to engage residents at Ping Manor in a 5-week social interactive program to promote health, improve quality of life, and well-being. Our vision is to address mental health concerns that are prevalent in individuals residing in low-income housing in La Crosse, WI. Our program will have 2nd year occupational therapy students (OTSs) facilitate social participation and wellness opportunities for participants to engage in and incorporate into their daily routines. During each session, participants will learn to incorporate social skills and positive mental health strategies through engagement in interactive group activities. In order to maximize the impact of the program and meet outcomes, we have partnered with Ping Manor in La Crosse, WI to fill a need in an underserved population. Outcomes will include improving mental health and quality of life, increasing perceived engagement and well-being satisfaction, and increasing social participation and engagement to promote a sense of community. These outcomes will be achieved through increased social engagement opportunities in a group setting and participating in activities that support well-being. Data will be collected on outcomes and will be used to further improve the program and increase participation for future sessions.

A.G.59 Motivated Mosher

Rylee Petit, Cody Cline, Emma Downs, Breana Haag, and Jack Speckman
Mentor: Erin McCann, Health Professions

Motivated Mosher is a group created to support and engage local veterans at Mosher Veterans home through social participation and activity involvement. Our program is necessary as research shows post-war veterans have decreased mental health often leading to an alarming amount of potential suicide attempts. On the contrary, research also shows social participation as a support for veterans' psychological benefit and an overall increase in quality of life. Thus, the need for a program to facilitate and develop these activities is necessary. The Motivated Mosher Club will be housed at Mosher Veterans Home which currently does not have a set activity schedule to promote social participation. To support occupational engagement, occupational therapy students at the University of Wisconsin - La Crosse planned social activities such as board games, trivia, outdoor activities, and engagement with a therapy dog to improve quality of life.

Poster Session B
9:55 am-10:50 am

B.G.40 The Effect of Isometric Exercise with Lower Extremity Blood Flow Restriction on Pain Pressure Thresholds

Bennett Christensen and Daniel Forman
Co-authors: Kelsey Berna, Sophie Olson, Molly Lyngaas, and Daniel Maatta
Mentor: Patrick Grabowski, Health Professions

INTRODUCTION: Research shows that an isometric quadricep exercise results in a post-exercise analgesic (PA) response at the patellar tendon. This effect has not been studied at the Achilles tendon. Blood flow restriction (BFR) has also been shown to cause a PA effect. No studies have assessed whether the combination of an isometric exercise of the calf and BFR result in a PA effect. PURPOSE: Determine the effect of an isometric calf exercise with BFR on pain pressure threshold (PPT) at local and non-local locations in healthy individuals. METHODS: Twelve healthy individuals completed a unilateral isometric calf exercise on their dominant leg until fatigue, with and without BFR on two occasions. PPT was measured at various locations before, immediately post, and 15 minutes post exercise. RESULTS: BFR and control conditions had a 14% ($p<.05$; Cohen's $d=0.36$) and 5% increase in PPT at ipsilateral Achilles tendon immediately post exercise, a 15% ($p<.05$; Cohen's $d=0.38$) and 6% increase at 15 minutes post exercise, respectively. A significant increase in PPT was seen at the contralateral Achilles at both time points. CONCLUSION: Exercising with BFR until fatigue may result in a stronger local analgesic response than traditional exercise, exceeding the minimal detectable change. Potential analgesic effects from BFR can provide valuable insight into the development of more specific rehabilitation protocols addressing functional limitations secondary to pain.

B.G.41 Assessment of English Learners (EL): School Psychologists' Perceived Competence

Skyler Bohn
Co-author: Jocelyn Newton
Mentor: Jocelyn Newton, Psychology

With the significant increase of English Learners (EL) throughout the United States, school psychologists are likely to work with students from diverse linguistic backgrounds. Therefore, the need for training in EL assessment has never been more apparent. The purpose of the current study is to identify factors that predict perceived competence for assessing ELs among School Psychologists. Specifically, do professional experience, level of training, and professional development predict school psychologists' perceived competence? The current study looks at the independent variables: professional experience and training and how they predict the dependent variable: school psychologists' perceived competence for EL assessment. Data will be collected from an anticipated sample of 100 school psychologists in Wisconsin. Participants will respond to demographic questions and then complete the 35-item Perceptions of School Psychologists Regarding Competency in Assessment of English Language Learners and Future Training Needs. Finally, participants will be asked qualitative questions regarding the measures they use when assessing ELs, how they determine the language of assessment, and what would further help them to increase their perceived competence for evaluating ELs. If a school

psychologist has experienced a high level of professional experience and training, they are more likely to have a higher perceived competence when evaluating ELs.

B.G.42 Teacher Burnout: Self-Efficacy of Behavior Management and School Psychologist Support

Abby Fischbach
Co-author: Robert Dixon
Mentor: Robert Dixon, Psychology

Over half of all teachers are leaving the field within their first five years. Burnout contributes to the lack of retention of teachers. Stress levels have been correlated to burnout and impact self-efficacy of teaching. This study aims to analyze the relationship among the components of burnout in teachers and their perception of support from school psychologists and how that impacts self-efficacy of behavior management.

B.G.43 Identification and Characterization of Mutations in *nmpR* That Restore Type-IV Pili Dependent Motility in *Myxococcus xanthus*

Ava Gehrke
Mentor: Daniel Bretl, Microbiology

Myxococcus xanthus is a Gram-negative bacterium that displays Type-IV pili-dependent motility. These pili are transcriptionally regulated by the two-component system (TCS) PilSR. A strain of *M. xanthus* in which the response regulator (RR) *pilR* has been deleted is non-motile. However, after extended incubation, restored motility was observed due to mutations in a different TCS, NmpRSTU. These mutations were in the RR *nmpR* and restored motility by causing NmpR to be in a constitutively active, or "ON" state. We sought to increase the number of known mutations in *nmpR* that would lead to this "ON" state and additionally characterize how these variants bind DNA compared to the wild type NmpR. A screen to select for *nmpR* mutants with restored motility was performed, and sequencing determined the site of mutation. Several mutations were identified in a linker domain of NmpR. To examine the impact of these mutations, $NmpR^{ON}$ variants were constructed, purified, and analyzed using electromobility shift assays to characterize DNA binding. It was observed that the NmpR variants had larger shifts compared to wildtype NmpR, even when one of two NmpR-binding sites was mutated. This suggests that the $NmpR^{ON}$ variants have increased oligomerization compared to the wildtype, which may explain how they are constitutively active. Since RRs are conserved across many bacterial species, this mutational analysis gives broad insight how TCS can compensate for loss-of-function mutations.

B.G.44 Long-Term vs. Short-Term Corticosteroid Use for Treatment of COPD Exacerbations

Kate Gentry and Sarah Modrak
Mentor: Karen Hayter, Health Professions

Our clinical scenario consists of a 64 year old male with a history of chronic obstructive pulmonary disease (COPD) seeking care in the emergency department for increased dyspnea over the past 48 hours. He is evaluated and considered to be experiencing an acute exacerbation. COPD is characterized by inflammation of the lungs and is currently the third leading cause of morbidity and mortality worldwide (Agarwal et al., 2022). We elected to approach this scenario through the lens of treatment of exacerbation, focusing on the use of systemic corticosteroids. Our clinical question aimed to compare the effectiveness of short term steroid therapy (< 7 days) with the standard 7-14 day course in treating acute COPD exacerbation. We first approached this question by searching PubMed and other databases for both primary and secondary research on the topic and identified relevant studies. We independently selected and critiqued articles based on validity, importance, and relevance to the patient. In general, we found that the shorter course of steroids was non-inferior to the longer course in terms of risk of treatment failure, risk of relapse, time to next exacerbation, and adverse effects. However, the data is not strong enough to definitively recommend a shorter course of steroid treatment as further research is indicated for patients with mild-moderate COPD not secondary to smoking, lack of established risk reduction, and small sample size upon systematic review.

B.G.45 Building the Capacity to Delivering Culturally Responsive Mental Health Practices

Katie Gilbert
Co-author: Ruth Schumacher-Martinez
Mentor: Ruth Schumacher-Martinez, Psychology

There is a rapidly increasing amount of culturally and linguistically diverse students. Because of this, it is important that school psychologists feel competent in culturally responsive mental health practices to meet the needs of diverse student populations they work with. This study aims to explore the connection between the multicultural competence of school psychologists in delivering culturally responsive mental health practices and the training and experience they have providing mental health services for diverse students.

B.G.46 Creative Conversations: An Evidence-Based Recreational Therapy Expressive Arts Curriculum for Individuals Experiencing Social Isolation in a Clinical Setting

Marissa Guldan
Mentor: Lisa Savarese, Recreation Management & Therapeutic Recreation

Social isolation or loneliness is "defined as the negative affective experience resulting from a perceived lack of social contact" (Baumann & Burke, 2021). Individuals with increased amounts of free time or alone time, such as older adults, report higher levels of social isolation; however, because of COVID-19, individuals of all ages saw an influx in their free time and alone time. Creative Conversations is an evidence-based recreational therapy curriculum grounded in the Empowerment Theory which proposes people, organizations, and communities can gain mastery over their lives. The curriculum consists of eight, 60-minute sessions that use expressive arts activities as a therapeutic approach to reduce perceived levels of social isolation for individuals 18-25 years old. Expressive arts is an integrative approach that uses various methods to help individuals achieve personal growth and understand their reactions to their experiences. This can be achieved as individuals express their creativity through different mediums of art such as writing, music, visual arts, drama, movement and more. By using various mediums, individuals can reflect upon themselves, their values, relationships, and collaboration creatively. Participants will be assessed by the NIH Toolbox Fixed Form (18+) and the PROMIS Social Isolation Short From (8a).

B.G.47 Iron Stress Can Be Better Understood through the Study of *Chlamydomonas reinhardtii* Mutants

Michael Hertel
Mentor: Anton Sanderfoot, Biology

Photosynthetic organisms serve as the base of nutrients and energy in a food web for an environment. An essential component for photosynthesis that can often be limited is iron. In order to determine and better understand what some of the genes involved in iron stress are, the model algae *Chlamydomonas reinhardtii* was used. Predicted mutants with genes relating to iron were ordered from Chlamydomonas Library Project. So far, PCR was performed on two of the ordered mutants, FOX1 and FTR, and the resulting gel electrophoresis showed bands present which indicated that they are successful mutations. These mutants were used to create screens and growth curves and identify the concentration of iron to induce stress in order to form conditions to test randomly generated mutants. In these growth curves the mutants showed decreased growth and photosynthesis when compared the wild type. Iron was added back into some of the low iron groups, and the absorbances increased, but not as much as the wild type. Using known mutants to generate conditions would mean randomly generated mutants that have mutations related to iron stress could be found. Once found, the generated mutants would be sequenced to identify the mutated gene. Not every gene has been characterized, so there is a possibility that a novel gene relating to iron stress is discovered. Any gene found could provide more insight into its function, not just in Chlamydomonas, but possibly in other photosynthetic organisms as well.

B.G.48 Crisis Response: Do You Follow Your Head or Your Heart?

Wylie Jackson
Mentor: Jocelyn Newton, Psychology

Crisis issues rank among the most distressing problems in education. School psychologists must be equipped with highly effective evidence-based and trauma-informed prevention and intervention strategies. This study examines how teacher's rational and experiential processing skills influence crisis self-efficacy. A regression analysis was completed to address

the independent variables of rational and experiential processing skill, and the dependent variable of crisis self-efficacy. Additionally, four qualitative questions were designed to broadly assess level of training and professional development on individual response patterns, previous crisis response situations, and perceived strengths and weaknesses. The results help schools more effectively design crisis planning preparation, and tailor communication about and during crises to teachers.

B.G.49 Investigating the Signaling Pathway of the G-Protein Rap1b in Megakaryocytes

Kori Kruegel and Josh Krause
Mentor: Jaclyn Wisinski, Biology

The G-protein, Rap1b, mediates megakaryocyte survival and function. Rap1b has been associated with integrin activation, allowing for adhesion and migration, as well as activation of the transcription factor ERK, which leads to proliferation and differentiation. The location of Rap1b within a megakaryocyte is mediated by the phosphorylation by cAMP-dependent protein kinase (PKA). Specifically, unphosphorylated Rap1b associates with membranes, while the negative charge of phosphorylation results in membrane detachment and diffusion throughout the cytosol. We hypothesize that unphosphorylated Rap1b participates in cell adhesion. Alternatively, cell proliferation and differentiation, which requires translocation between the cytoplasm and nucleus, may use phosphorylated Rap1b. To test this hypothesis, we focused on the location of Rap1b activation using the Rap1b – FLuorescent Activity REporter (Rap1b-FLARE) in the DAMI megakaryocytic cell line. Cells treated with GTPγ S showed robust activation Rap1b activation, as expected. To promote Rap1b phosphorylation, cells were treated with Forskolin (FSK) to activate cAMP/PKA signaling. In contrast, cells were treated with the PKA inhibitor, H-89 to limit Rap1b phosphorylation. The localization and extent of Rap1b activation was monitored by confocal microscopy. Establishing these controls will help create and optimize a protocol that will allow us to further study the signaling pathways of Rap1b.

B.G.50 Effects of Concurrent Auditory, Visual, and Tactile Feedback of Cadence on Achilles Tendon Loading in Running

Callie Pohlman and Kadin Courson
Mentors: Thomas Kernozek and Drew Rutherford, Health Professions

Running-related injuries are common and have been shown to have a high recurrence rate. A common intervention for these injuries is cadence manipulation. Manipulating cadence commonly involves visual, verbal, auditory cueing. There is a need to examine how different forms of feedback may influence Achilles tendon (AT) loading. The purpose of this study is to compare the effect of visual, auditory, and tactile feedback of cadence on running mechanics. Data were collected at the participants' normal cadence without feedback, 5%, and 10% perceived increase in cadence, then normal 5% and 10% cadence using visual, tactile, and auditory feedback. Kinetic data was measured using an instrumented treadmill sampled at 1800 Hz. Joint kinematic and kinetic data were determined with a 16-segment musculoskeletal model. Muscle forces were calculated using static optimization for the lower extremity muscles and, along with cross sectional area of the Achilles tendon from ultrasound imaging to estimate Achilles tendon stress. Participants ran 2-3 minutes at 7.5 mph during each cadence manipulation. Visual and auditory feedback were provided with a computer-based metronome. Tactile cues were provided with a wearable device. Data will be examined between the various methods of feedback to influence cadence and Achilles tendon loading in running.

B.G.51 Teacher Perceptions of the Roles and Functions of School Psychologists

Bridget Schilling
Co-author: Daniel Hyson
Mentor: Daniel Hyson, Psychology

Understanding teachers' perceptions of tasks school psychologists conduct is essential to improving consultation and student outcomes. This session will help participants identify components of school psychologists' roles in schools. Participants will use data about areas in which teachers would like more support from school psychologists to inform the tasks they conduct in schools. Participants will compare the results regarding teachers' perceptions about school psychologists' roles and functions with their own role in schools.

B.G.52 The Influence of External Load on Patellofemoral Joint Stress during Squatting in Competitive and Recreational Athletes

Marina Schwanke, Amber Anderson, Ally Heidorn, Matthew Vandenberg, Ethan Hickcox, and Maryjoy Maltizo
Drew Rutherford, Thomas Kernozek, and Steni Sackiriyas
Mentors: Steni Sackiriyas and Drew Rutherford, Health Professions

Introduction: Squats can increase Patellofemoral Joint Stress (PFJS). However, how physical activity level impacts PFJS during squats at various loads has not been extensively investigated. The purpose of this study was to compare the PFJS while squatting with incremental external load in recreational and competitive athletes. Methods: Thirty-three healthy adults (18 to 30 years) participated in this research study. We collected kinematic and kinetic data using a three-dimensional motion capture system and force platform at a frequency of 180 Hz and 1800 Hz, respectively. Using a musculoskeletal model, we assessed muscle forces through static optimization. We used a patellofemoral model to estimate PFJS. Discussion: We will analyze how external load at various levels influences PFJS while squatting in recreational and competitive athletes. The results can be useful to clinicians and athletes in choosing an appropriate level of stress on the knee during squat training.

B.G.53 Reimagining CICO: Using a Collaborative and Proactive Solutions Approach

Genevieve Stout
Mentor: Daniel Hyson, Psychology

Traditional Positive Behavior Interventions and Supports (PBIS) is a multi-tiered system to manage student behavior. Check-In/Check-Out (CICO) is a popular Tier 2 intervention used within PBIS systems. While CICO has been found to reduce behavior problems, little research has continued to seek how to improve this intervention. This study seeks to evaluate a Collaborative and Proactive Solutions (CPS) focused CICO intervention implemented to improve the effects of CICO on student behavior.

B.G.54 Academic Socialization: Key Motivators for High School Parent Engagement

Benjamin Thom
Co-author: Robert Dixon
Mentor: Robert Dixon, Psychology

Parent engagement has been linked to increased academic achievement, high school completion rates, social/emotional well-being, and many other benefits (DeSpain et al., 2018). Academic socialization is a more developmentally appropriate behavior for high school parents, and it is described as communication between parents and their children that conveys the importance of education, their aspirations for the adolescent, and plans for the future. The purpose of this study is to examine what motivators of parent engagement predict differences in academic socialization among high school parents. 176 parents of students in Midwest high schools completed an electronic survey including 63 Likert-scale items. The independent variable was the three key motivators of parent engagement – personal motivators, parent perceptions of invitations or demands, and parental resources. The dependent variable was parent's degree of engagement through academic socialization. Additionally, parents were asked qualitative questions to describe what their school does well, barriers, and their needs regarding engagement. Quantitative data was analyzed through a stepwise multiple regression analysis, and a content theme analysis was completed for the qualitative data. Parental resources were most influential on academic socialization, followed by parent perceptions of invitations or demands. Implications for parents, schools, and school psychologists are discussed.

B.G.55 Collaborative and Proactive Solutions: Additional Impact of Practitioner Multicultural Competency

Emily Wagener
Co-author: Daniel Hyson
Mentor: Daniel Hyson, Psychology

Black students are more likely to be suspended for subjectively negative behaviors than their White counterparts. The National Association of School Psychologists has called for current practitioners to address such disparities by becoming competent in multicultural differences. Ross Greene's Collaborative and Proactive Solutions aims to utilize equitable

practices by promoting teacher-student collaboration in problem solving. The current study examines the impact of multicultural competency level in practitioners' perceived efficacy in using Greene's ALSUP interview form.

B.G.56 The Effect of Canine Pet Therapy on Anxiety Symptoms in College Students

Anna Kaminski, Bella Ruetten, Ashley Agrimson, Alexa Schroeder, and Kyra Dokken
Mentor: Naghmeh Gheidi, Exercise & Sport Science

Anxiety and depression related to educational and life stressors threaten the wellbeing of college students. The utilization of pet therapy to address these negative mental health symptoms has been shown to be successful in this population. The objective of this research is to investigate the effects of pet therapy on college students at the University of Wisconsin – La Crosse with use of a service dog and administration by occupational therapy students. There will be two intervention sessions with a week between. Participants will complete the State Trait Anxiety Inventory (STAI) prior to interacting with the dog at the first session and after interacting with the dog at the second session to be used as an outcome measure of anxiety symptoms. The timing of activities completed with the dog will be recorded. It is expected that the two intervention sessions of pet therapy will decrease anxiety symptoms in UWL students.

B.G.57 The Effect of Animal-Assisted Therapy on the Stress Levels of Female Pre-health College Students

Alyssa Swenson, Amanda Klaeser, Alyssa Kliment, Julia DeMain, and Sarah Carlton
Mentor: Naghmeh Gheidi, Exercise & Sport Science

College students are notorious for experiencing feelings of stress due to the high demands of academia. One way campuses have attempted to mitigate these feelings among their students is by increasing the utilization of animal assisted interventions. This study aims to examine if animal-assisted therapy will improve symptoms of stress when interacting with a dog for a short period of time. It is hypothesized that interacting with a dog can improve stress symptoms of blood pressure and reported stress levels. Participants will include full-time female college students in pre-health majors at UWL. They will be asked to interact with a dog for 15 minutes, rating their stress levels and getting their blood pressure taken before and after the interaction. SPSS will be utilized to analyze and interpret data collected during the study.

B.G.58 The Effects of Ergonomic Standing Desks Compared to Traditional Desks on Psychological Well-Being among College Professors

Madi North, Brianna Carpenter, Emily Holzheimer, Katelyn Ihrke, and Jack Speckman
Mentor: Naghmeh Gheidi, Exercise & Sport Science

Sedentary activity is very common for desk-based employees, and the effects can be very harmful. Prolonged periods of sitting have been correlated with musculoskeletal pain, reduced workplace productivity and job performance, and high risk of developing various cognitive and physical disorders. Sedentary activity is most likely to take place in the workplace for desk-based workers. The purpose of this study is to analyze the effects of ergonomic sit-to-stand desks among college professors within the UW system on psychological well-being. Participants will be recruited via email and word-to-mouth and will be asked to use their standing desks for three hours per day for three weeks. Psychological well-being will be assessed using the Warwick-Edinburgh Mental Well-Being Scale (WEMWBS) as well as an additional questionnaire created by the researchers of this study.

B.G.59 Determining Awareness of Pelvic Floor Dysfunction Postpartum Treatment between Moms, Physical and Occupational Therapists: Descriptive Study

Havala Snyder, Renee Murphy, Emma Downs, Hailey Struzynski, and Brianna Perry
Mentor: Naghmeh Gheidi, Exercise & Sport Science

There is currently a gap in the quality of services provided to postpartum mothers as they are sent home with little education on pelvic floor dysfunction (PFD) treatment options. While physical therapy (PT) is commonly acknowledged for treating PFD, all aspects of mothers' quality of life (QoL) are not being addressed through pelvic floor exercises. Occupational therapists (OTs) can provide the services to cover this gap. The purpose of this research is to determine the awareness of PFD postpartum treatment between mothers, PTs and OTs. Surveys will be sent out to a convenience sample of mothers, PTs, and OTs to determine awareness and gaps in services. Descriptive statistics and frequencies using SPSS will be used to determine significant patterns in responses from participants. Determining the awareness of new mothers,

PTs, and OTs role in PFD and gaps in treatment related to QoL will assist with advocating for the field of OT and increase access to quality services for mothers.

B.G.60 A Survey of Current Practices in Occupational Therapy Interventions for Patients Experiencing Chronic Pain

Breana Haag, Miranda Gajewski, Rylee Petit, Cody Cline, Maimee Vang, and Olivia Griesbach
Mentor: Naghmeh Gheidi, Exercise & Sport Science

Chronic pain is a frequent symptom seen in patients treated by occupational therapists (OTs). Frequently, patients are treated using traditional biomechanical and compensatory approaches including range of motion exercises, strengthening, and activity modifications; however, these approaches do not target the cognitive components. The purpose of this study is to understand whether cognitive strategies are currently utilized in the treatment of chronic pain, and reasons for omitting strategies. In this project participants will be asked to respond to questions relating to experiences within the OT profession, interventions utilized in the treatment of chronic pain, effectiveness, and reasons for incorporating or omitting cognitive strategies. Responses will be analyzed through descriptive statistics, differences in the proportion of OTs utilizing cognitive approaches, and differences in the perceived effectiveness of treatment. The results of this study could be useful to OTs to understand how evolving research regarding cognitive strategies are being implemented by other OTs.

Poster Session C
11:00 am-11:55 am

C.G.45 Shoreline Woody Debris in Pool 8 of the Upper Mississippi River

Matthew Chen
Mentor: Eric Strauss, Biology

Woody debris is recognized as an important habitat structure within riverine ecosystems, yet we know very little about its role in large floodplain rivers such as the Upper Mississippi River. Wood is known to play a key role in biogeochemical cycling withing rivers while also providing critical habitat to a wide array of aquatic and terrestrial organisms. Despite its ecological importance, wood has historically been removed from culturally significant bodies of water, such as the Upper Mississippi River, for navigational and recreation purposes. Defining the ecological role of wood in large floodplain rivers is an important step towards developing better conservation, restoration, and management practices for the future. The objective of this study is to identify patterns in the distribution of shoreline large woody debris in the upper UMR Pool 8; where is wood located and how did it get there? A probability survey of 47 shoreline sites, 23 main channel and 24 side channels, was conducted for wood larger than one meter in length. In total, 125 pieces of large wood were surveyed, occurring at a rate of 3.52 pieces per 100m in the main channel and 1.83 pieces per 100m in the side channels. Within the main channel it appears that significant downstream transportation of wood is occurring, while side channels may rely heavily on local deposition of wood. Results from this study offer insight into the movement and accumulation of wood in the UMR.

C.G.46 Comparison of Angular versus Linear Isokinetic Devices on Muscular Fatigue

Rachel Danhauer, Molly Carstensen, and Mitch Reigard
Mentor: Drew Rutherford, Health Professions

Isokinetic devices are commonly used measurement instruments for assessing joint strength in rehabilitative and athletic settings. These devices can also assess the decrease in peak torque over multiple repetitions which is used to represent muscular fatigue. The progression of fatigue is well known in maximal efforts isolated within single joint movements; however, investigations into maximal efforts during repeated multi-joint tasks are limited. The purpose of this study is to compare the fatigue associated with performing a single joint vs multi-joint strength task of the lower extremity at constant speeds. It is hypothesized that the latter will induce more fatigue than the former when both are performed at constant speeds. Data were analyzed from 15 healthy participants. Participants performed 15 repetitions of a maximal leg press on the QuickHIT, a custom-built linear isokinetic dynamometer (QuickHIT Fitness Lab, La Crosse, WI). During a different session, participants performed 15 repetitions of maximal hip and knee extension using the Cybex Isokinetic Device (Cybex HUMAC Norm, CSMI Inc., Stoughton, MA). Both devices load the musculature through a pre-selected range of

motion at a constant speed. The torque for each joint across the angular position was collected. Future analysis will include comparing peak torque over time to assess fatigue between the QuickHIT and Cybex devices.

C.G.47 Fructose Dehydrogenase Characterization in the Pursuit of Creating a Fructose Biosensor

Tayler Farrington
Co-author: Paul Schweiger
Mentor: Paul Schweiger, Microbiology

Nonalcoholic fatty liver disease (NAFLD) is a major health issue that can lead to cirrhosis and even death. One marker of NAFLD is increased fructose in blood and other tissues. The creation of a point-of-care fructose meter is critical for early diagnosis and treatment for improved patient outcomes. Fructose dehydrogenases (FDH) commonly found in acetic acid bacteria can be used as a fructose biosensor. FDH oxidizes fructose to 5-keto-fructose and can be detected as an electrical signal. The limited commercial availability of FDH leads to a high demand in different industries, including healthcare. We aim to identify bacterial strains that can contain highly active FDH. Acetic acid bacteria will be screened for FDH activity using a whole cell colorimetric assay. Candidate FDHs will be overexpressed in the acetic acid bacteria *Gluconobacter oxydans*, which lacks a functional FDH, and *Pseudomonas* spp. Bacterial strains overexpressing highly functional FDH will be identified and the FDH enzyme will be purified. Purified protein will be shared with collaborators at the University of Maryland School of Medicine to help create a fructose biosensor. A liver biopsy is currently the gold standard for diagnosing liver disease, but it can be expensive, invasive, and risky for a patient. A fructose biosensor would help alleviate the cost and risk to the patient and allows for earlier diagnosis of liver disease.

C.G.48 Comparison of Gait Biomechanics and Muscle Forces between Overground and Treadmill Running

Nicole Fry, Tali Tripp, Madison Hurrle
Mentor: Drew Rutherford, Health Professions

The purpose of this study was to examine how lower extremity biomechanics and muscle forces may differ when running on a treadmill compared to overground running. We hope to verify that these modalities are sufficiently similar in order to give researchers confidence that the increased ease of data collection using a treadmill accurately represents the overground conditions that most runners participate in. Participants were examined using a Treadmetrix instrumented treadmill (Park City, UT) and during overground running using timing gates. Both methods utilized a 3-D motion capture system (Motion Analysis Corp., Rohnert Park, CA). Participants included healthy college-aged males and females (18–35-year-olds) with a typical training volume of > 10 miles/week. Future analysis will focus on peak joint angles and torques for the ankle, knee, and hip. Understanding the degree of these similarities will enable the Biomechanics Laboratory in the Physical Therapy Program to utilize both a treadmill-based motion capture system and overground force platform system to collect data from runners to conduct performance analyses.

C.G.49 Comparison of Tenecteplase and Alteplase for Treatment of Acute Ischemic Stroke

Erin Gast and Taylor Ebben
Mentor: Karen Hayter, Health Professions

A 78-year-old female with a history of hypertension, hyperlipidemia, and atrial fibrillation presents to the ER with a 2-hour history of slurred speech. She has other stroke symptoms including expressive aphasia, left facial droop, right-sided numbness and weakness. The gold standard thrombolytic for acute ischemic stroke (AIS) is currently Alteplase (tPA), which should be given within 3 hours or up to 4.5 hours since the patient was last seen in a state of well health. Alteplase is the only FDA-approved thrombolytic for AIS. Another thrombolytic, Tenecteplase (TNK), is used for myocardial infarction; however, research has been conducted investigating the use in AIS. We were interested in the rationale as to why tPA is preferred over TNK; therefore, we took the perspective of treatment to investigate current research to make the best recommendation for our patient. We conducted a literature search using PubMed and the UWL Library database for recent articles comparing tPA and TNK for AIS. Overall, there were no statistically significant differences in patient outcomes between the two treatments apart from TNK demonstrating a better reperfusion rate and early neurological improvement. Given the vast amount of high-level research which includes systematic reviews and meta-analyses, we recommend TNK to our patient due to its equivalent efficacy and safety compared to tPA with the potential additional benefits of superior reperfusion and neurologic well-being.

C.G.50 Axl Inhibition Combats Chk1-Inhibitor Resistance in Five TNBC Cell Lines

Dannira Kulenovic
Mentor: Sierra Colavito, Biology

Breast cancer is amongst the most diagnosed cancers in the world; while progress has been made in developing specialized treatments, drug resistance is becoming prevalent. Our lab has identified Checkpoint kinase 1 as a potential target to treat triple negative breast cancers, and we have developed five cell lines with secondary resistance to the Checkpoint kinase 1 inhibitor AZD7762. Checkpoint kinase 1 is a key factor in regulating cell cycle progression, and disruption of this protein leads to improper cell proliferation and cell death. Previous research has shown that the protein Axl is implicated in drug resistance in several cancers, as well as cancer proliferation and metastasis. To examine the role of Axl in AZD7762-resistance, I am using several biological and molecular assays such as colony formation assays, western blotting, and immunofluorescence. Colony formation assays have shown that the Axl-inhibitor R428 diminishes clonogenicity of AZD7762-resistant tumor cells in combination with AZD7762 ($p < 0.05$). Preliminary western blots show an increase in DNA damage markers, as confirmed by preliminary immunofluorescence work. This preliminary work implicates Axl as a driving factor in AZD7762-resistance, and further work will confirm if Axl inhibition is sufficient in sensitizing AZD7762-resistant triple negative breast cancers to treatment.

C.G.51 Suture-Button Fixation versus Screw Fixation for Syndesmotic Ankle Injuries in Athletes

Lauren Lisowski and Matt Nordby
Mentor: Karen Hayter, Health Professions

A syndesmotic ankle sprain is an injury to one or more of the ligaments of the distal tibiofibular joint and is a challenging injury for athletes, with a relatively long recovery time and a lack of established treatment guidelines. The purpose of this study is to conduct a review that compares two surgical treatment methods: fixation with either syndesmotic screws (SS) or suture buttons (SB). The review included systematic reviews/meta-analyses, randomized controlled trials, case series, and cohort series from the Cochrane Library, PubMed, MEDLINE, and the Journal/Author Name Estimator search engine. Several outcomes were measured, including return to play, complications, unplanned reoperation, malreduction, and ankle stability indices. It was often found that SB showed a significant advantage in ankle stability compared to SS. However, secondary outcomes demonstrated conflicting results between studies and it is unclear if SB provides an advantage over SS regarding malreduction and complications. Despite various insignificant outcomes and contradictions, studies did not provide any benefit for SS over SB. Overall, some outcomes (return to play, malreduction, complications) are not statistically significant or differ in significance between studies, while other outcomes (unplanned reoperations, ankle stability) have shown SB to provide a significant advantage. Based on a general consensus in the literature, there is sufficient evidence to choose fixation with SB over SS.

C.G.52 Effect of External Load on Patellofemoral Joint Stress during Squatting in Healthy Adults

Marina Schwanke, Sophia DeCleene, Charlene Schmidt, Jarod Burds, Skyler Yunk, Ryan Bastyr, and Patrick Andrews
Co-authors: Drew Rutherford, Thomas Kernozek, and Steni Sackiriyas
Mentors: Steni Sackiriyas and Thomas Kernozek, Health Professions

Introduction: Patellofemoral Joint Stress (PFJS) can increase more than body weight during squat training. However, the impact of carrying an external load close to the body during squats on PFJS has not been extensively investigated using a musculoskeletal model. This study aimed to compare the effect of external load at different percentages of body weight on PFJS while squatting in healthy adults. Methods: Thirty-three healthy adults (18 to 30 years) participated in this study. Kinematic data was collected using a three-dimensional motion capture system at 180 Hz and kinetic data with force platforms at 1800 Hz. Using a musculoskeletal model, muscle forces were assessed through static optimization. A patellofemoral model was used to estimate PFJS. Statistical Analysis: A one-way repeated measures ANOVA compared the effects of various external loads on PFJS during squatting. Results: There was a significant effect of load on PFJS ($F(5, 3) = 6.61$, $p=.001$) and the changes in PFJS were different with various loads. Discussion: The preliminary results from the eight subjects' data suggest that increasing body weight by 20%, 30%, and 35% significantly increases PFJS on the knee. These results can be useful to clinicians and athletes in choosing an appropriate level of stress on the knee during squat training.

C.G.53 Effect of Anti-pronation Neuromuscular Taping in Runners with a Neutral to Pronated Foot Type

Drew Schwarz
Co-authors: Cydney Byington (Loras College), Marissa Castañeda (Rush University), Kari Emineth, and Naoko Giblin
Mentor: Naoko Giblin, Exercise & Sport Science

Context: The purpose of this study was to determine if anti-pronation Kinesiology Tape (KT) can reduce the amount of pronation in runners. Methods: Twenty runners (12M/8F, age=25.45±10.07yr, mass=74.03±11.75kg, height=1.75±0.87m with specified foot types (Foot Posture Index [FPI]=3.10±2.94) volunteered. Participants attended 3 testing sessions. Navicular drop (ND), and ground reaction forces were measured. After each run the participants reported rate of perceived exertion (RPE), Pain levels, and stability levels. Peak forces were measured and normalized. ANOVA was performed for each force variable, FPI, and ND. Within-subject ANOVAS were performed for RPE, pain, and comfort. Bonferroni correction was performed for significant interactions. Results: Lateral region force was significantly lower at mile 3 ($p=0.006$). Medial/lateral force ratio was significantly lower at mile 3 compared to mile 0 ($p=0.043$). However, there were no Condition main effects on all force variables. There was no significant difference in FPI ($p=0.448$) or ND ($p=0.058$). Participants reported greater comfort ($p \leq 0.001$) and stability ($p=0.036$) during KT conditions. There were no significant differences in RPE or pain. ($p > 0.05$). Conclusion: Participants seemed to display more pronated foot strike; however, KT did not have any effect on other static or dynamic measures. Anti-pronation KT did improve subjective comfort and stability.

C.G.54 Mechanism of Cold Resistance in Platelets from Hibernating 13-Lined Ground Squirrels *(Ictidomys tridecemlineatus)*

Vanessa Mbuyi, Kaitlyn Michalek, Nicole Weber, and Dana Carlson
Co-authors: Anton Hansen, Annabelle Stang, and Morgan Clark
Mentor: Scott Cooper, Biology

Platelet transfusions are clinically important, but platelets can only be stored for seven days at room temperature due to microbial contamination. Human platelets stored in the cold undergo apoptosis (programmed cell death) and are rapidly cleared from circulation post-transfusion. When human platelets are stored in the cold, glycoprotein Ibα receptors cluster, activating a pro-apoptosis signaling pathway. The platelets of hibernating mammals, such as 13-lined ground squirrels (*Ictidomys tridecemlineatus*), remain in circulation after storage at 4ºC, making this a model organism for this research. Chilled ground squirrel platelets assume a rod-shape which may prevent receptor clustering and apoptosis. To investigate how ground squirrel platelets avoid apoptosis during cold storage, human and ground squirrel platelets were collected and then stored at both room temperature and at 4ºC. Glycoprotein 1bα receptors on platelets were tagged with fluorescent-labelled antibodies and analyzed by flow cytometry and Fluorescence Resonance Energy Transfer (FRET). Human platelets stored in the cold showed an increase in FRET consistent with clustering of the receptors. FRET analysis of ground squirrel platelets stored in the cold will be compared to human platelets.

C.G.55 Effects of Exercise-Induced Exosomes on Triple Negative Breast Cancer Cells

Kaitlyn Schneider
Mentors: Sierra Colavito and Jennifer Klein, Biology

Triple negative breast cancer (TNBC) is an aggressive form of breast cancer that is extremely difficult to treat. Currently, the most used treatment methods include surgery and chemotherapy, both of which are invasive and generally have negative effects on the patient. This leaves the need for a less invasive and more effective treatment method. Current research shows that exercise can decrease tumor growth, suggesting that physical activity releases a systemic mediator of cancer growth into the bloodstream. I hypothesize that these mediators are released via a type of extracellular vesicle, called an exosome. Exosomes can carry miRNAs that cause repression of translation of proteins, causing decreases in proliferation. These miRNAs can be identified, manufactured, and used to target and treat TNBC cells. Preliminary data suggests that exosome treatment reduced the proliferation of a TNBC cell line, but not of a normal mammary cell line. Future experiments will work to identify whether the decrease in proliferation is due to an increase in apoptosis or differentiation through the use of RT-qPCR and Western blots.

C.G.57 Investigating Mitochondrial Function with Passive Stretch and Ischemic Pre-conditioning

Maxwell Walker
Co-authors: Sarah Fenn and Jacob Caldwell
Mentor: Jacob Caldwell, Exercise & Sport Science

INTRODUCTION: Passive calf stretching (PS) elicits reduced tissue saturation similar to that shown during ischemic preconditioning (IPC). The magnitude of change to mitochondrial capacity during this treatment is unknown. The purpose of this study was to investigate intermittent PS and IPC on mitochondrial dynamics. Given the increased metabolic activity during PS, we hypothesized that PS would increase mitochondrial dynamics more than IPC. METHODS: 18 college-aged subjects participated in this randomized, crossover study. This included 2 laboratory visits one week apart. Subjects started a 10-minute rest period, followed by resting blood pressure. Next, an intervention of PS (stretched with bilateral splints to moderate discomfort) or IPC (bilateral cuff inflation on upper thigh at a supra-systolic pressure) was administered 4 times with 5 minutes "on" and 5 minutes "off", followed by post testing. Mitochondrial function was measured with a Near-Infrared Spectrometer (NIRS) where 1-minute of plantar flexion exercise with an absolute weight of 35 pounds was used. RESULTS: Pre vs. Post PS showed significant changes. Pre vs. Post IPC showed non-significant changes. CONCLUSION: PS appeared to have significant impact on NIRS-derived mitochondrial dynamics, while IPC appeared to have a non-significant impact.

C.G.58 Characterizing *Myxococcus xanthus* Fruiting Body Development in NmpRSTU Suppressor Mutants that Restore Type-IV Pili-Dependent Motility

Mason Stenzel
Co-author: Daniel Bretl
Mentor: Daniel Bretl, Microbiology

Myxococcus xanthus is an aerobic soil bacterium that is known for its complex social behaviors like microbial predation, multicellular development, and two different forms of motility. The mechanisms underlying these social behaviors make *M. xanthus* an exceptional model for both cell-to-cell cooperation and cellular signaling systems. For example, when nutrients in the environment become scarce, *M. xanthus* develops multicellular structures called fruiting bodies that are filled with spores for survival. This fruiting body development process is highly dynamic and requires a form of motility known as social motility. Social motility is Type-IV pili (T4P) dependent and is regulated by a two-component signaling system (TCS) called PilSR. When *pilR* is deleted, *M. xanthus* cannot move or develop fruiting bodies; recently, mutations in a separate multi-component signaling system called NmpRSTU were discovered to restore motility to this otherwise nonmotile Δ*pilR* strain. The goal of my work was to characterize fruiting body development in the strains with social motility restored via NmpRSTU mutations, and I found that although these strains clearly displayed the social motility required for development, development was not restored. I hypothesize that development was not restored because the mechanism in which the NmpRSTU system restores social motility results in the T4P gene being constitutively expressed, and that this constitutive expression is detrimental to development.

C.G.59 Parental Provisioning and Resource Variation in Flammulated Owls *(Psiloscops flammeolus)*

Jason Tendler
Co-author: Markus Mika
Mentos: Markus Mika, Biology

Flammulated Owls (*Psiloscops flammeolus*) are avian insectivorous migrants that breed in western mountain ranges in the United States. There are many knowledge gaps in the ecology of this secretive species. Specifically, parental investment and partitioning efforts by parents during the nesting season are understudied. The purpose of this project is to estimate food provisioning rates to the nest and labor partitioning between the parents for their young across nests located in habitats of different quality characteristics. In this study, I (1) captured and marked adult female owls in occupied nests to differentiate them from their male mating partners, (2) mounted motion-activated trail cameras inside occupied Flammulated Owl nests to record food deliveries throughout the nesting season, and (3) utilized insect traps to assess the habitat quality surrounding each occupied nest. I have collected one season of data on feeding rates and relative investments by each parent, and I intend to conduct and additional field season in the summer of 2023. During analysis, I will compare those estimates to indicators of quality for each occupied nest territory. These data will allow us to compare provisioning rates across multiple breeding seasons and in a variety of territory qualities to understand how these owls may adjust to environmental changes over time.

Poster Session D
12:05 pm – 1:00 pm

D.G.33 Finding Your Path: School Psychologists Self-Reports of Multicultural Competence

Andrea Schwarz
Co-author: Jocelyn Newton
Mentor: Jocelyn Newton, Psychology

Student populations are becoming increasingly diverse, yet most school psychologists identify as predominantly White. Therefore, multicultural competence is essential to ensure equitable outcomes for students. The current study aims to identify multicultural personal and professional experiences that contribute to self-reported multicultural competence in a sample of school psychologists.

D.G.35 Loss and Healing: School Psychologists' Self-Efficacy in Supporting Grieving Students

Lena Bergo
Co-author: Ruth Schumacher-Martinez
Mentor: Ruth Schumacher-Martinez, Psychology

Approximately 90% of students will suffer the loss of a friend or loved one at some point during childhood. Childhood grief and loss contribute to negative mental health and educational outcomes. The present study aims to identify what most determines school psychologists' comfort level when supporting grieving students. The outcome of this study will inform approaches to better prepare school psychologists as mental health providers to care for grieving school communities.

D.G.36 Performance Readiness Following Anterior Cruciate Ligament Reconstruction (ACLR)

Alex Bongers, Elisabet Pietz, and Paolo Turco
Co-author: Thomas Gus Almonroeder (Trine University)
Mentor: Hanni Cowley, Health Professions

Previous research has established that injury risk factors may still present in athletes post Anterior Cruciate Ligament Reconstruction (ACLR) and rehabilitation. ACLR rehabilitation lacks a consensus on the best return-to-sport protocol. The reactive strength index (RSI) has been developed as a mechanism to monitor the stress on the musculotendinous complex during plyometric exercises. The RSI descries an individual's ability to change direction quickly from an eccentric to a concentric muscular contraction and expresses the athletes' explosive capabilities in dynamic jumping activity. This metric may be used to determine performance readiness to return to sport. This study is a novel approach to compare sports performance markers (vertical height, propulsion forces, and RSI) in athletes that have undergone reconstruction vs a control group.

D.G.37 Effects of Short-Term L-citrulline Supplementation on Arterial Function during Cold-Pressor Test in Older Adults

Briley Dall
Co-author: Lauren Zimmerman
Mentor: Salvador Jaime, Exercise & Sport Science

Aging induces an increased risk in cardiovascular events due to increased stiffening of the arteries and endothelial dysfunction. Cold exposure amplifies vascular responses, resulting in an increased risk for cardiac-related events. L-citrulline attenuates hemodynamic responses to cold exposure following a 2-week supplementation period. The aim of this study is to observe acute ingestion (30-minute post) of L-citrulline (9g) on hemodynamics at rest and during a cold pressor test (CPT). Methods: 12 adults aged 45-95 with no recent cardiac events will be tested. Subjects will be randomly assigned L-citrulline (9g) or the placebo supplementation 30 minutes prior to testing in a double-blind crossover design (3-day washout). Indices of blood pressure [pulse wave analysis (PWA)] and arterial stiffness [pulse wave velocity (PWV)] will be measured at rest. Following ingestion, subjects will lay supine for 30 minutes in a quiet and temperature-controlled room. After, PWA and PWV will be repeated. Shortly after, the CPT will be performed. PWA will be measured

once in the last minute of the CPT. After, PWV will be measured again. Results and discussion: Data collection and analysis is ongoing.

D.G.38 Training Load of Reserved Officer Training Corp (ROTC) Cadets Compared to Division 3 American Football Players

Ethan Gerbig, Rachael Brochtrup, Kyle Terhark, and Morgan Zink
Co-authors: Ward Dobbs and Thomas Gus Almonroeder (Trine University)
Mentor: Hanni Cowley, Health Professions

Physical training is a key component for the Reserve Officer Training Corps (ROTC). Recent review identified that current military training practices require a greater variation in training stimulus in order to elicit more effective and military-specific training adaptations. The Army Combat Fitness Test (ACFT) has recently been implemented to improve the predictability of service member success in the field. Thus, there is an innate need for structuring training regimens to better prepare cadets for the ACFT. Unfortunately, most ROTC programs across the country, including the Eagle Battalion, do not have sufficient resources to hire professional staff to oversee strength and conditioning and other resources that have become commonly available to the sporting athlete. As such, it has been reported that physical training sessions are designed and led by officers or cadets within a specific battalion, regardless of training knowledge. This study aims to compare the training loads of ROTC cadets compared to the intensity load demand of the ACFT test. Additionally, the training loads of ROTC cadets will be compared to training loads of Division 3 American Football players.

D.G.39 Vascular Responsiveness to a Nitrate Supplement in Postmenopausal Women

Alissa Koenke and Lauren Zimmerman
Co-authors: Sarah Fenn and Maxwell Walker
Mentor: Jacob Caldwell, Exercise & Sport Science

Reduced blood vessel vasodilation, via reductions in nitric oxide bioavailability, is associated with low estrogen concentrations, typically found in postmenopausal women (PMW). Dietary nitrate supplementation is thought to improve nitric oxide bioavailability in PWM. It is hypothesized that dietary nitrate will improve both macro- and microvascular blood vessel responses in PMW. 15-20 healthy, PMW participated in a double-blind (placebo vs nitrate), randomized, crossover protocol including a resting flow-mediated vasodilation (FMD) test to assess large vessels and two tests using near infrared spectroscopy (NIRS) to assess small vessel responses. Initial, (n=4), results show FMD in the nitrate poor trial was 6.25±1.41% while FMD in the nitrate rich trial was 7.87±% ($p>0.05$). NIRS derived microvascular responsiveness in the nitrate poor trial was 1.64±0.50 while the nitrate rich trial was 1.16±0.03 $\%/s^{-1}$ ($p>0.05$). Data collection is still ongoing, but initial results suggest that nitrate supplementation does not improve large or small blood vessel function in PMW. These tests were performed at rest and likely do not indicate vascular responses that may manifest during small muscle mass exercise.

D.G.40 Use of Terminal RPE during Rockport Walking Test to Predict VO2max and VT in Sedentary Individuals with BMI Greater than 25

Duresa Kumbi
Mentor: Kimberley Radtke, Exercise & Sport Science

The purpose of this study is to improve the accuracy of predicting VO_{2max} and ventilatory threshold using the Rockport Fitness Walking Test (RFWT) and terminal Rating of Perceived Exertion (RPE) in individuals with BMI > 25. Thirty-four subjects ranging from 18-65 years of age, who were considered primarily sedentary individuals, were recruited for this study. Each subject performed an incremental maximal treadmill test using a modified Balke protocol. VO_{2max} was measured using open circuit spirometry. Subjects performed two separate RFWTs providing terminal RPE scores. The primary investigator is finishing data collection by March 15, 2023. All data will be screened for accuracy, completeness, and normality. SPSS will be used for statistical analysis.

D.G.41 Age and Feedback Effects on Impact Force and Knee Position during Drop Landing in Females

Megan Pierson and Becca Fox
Co-authors: Becky Heinert (Winona State University) and Drew Rutherford
Mentor: Thomas Kernozek, Health Professions

Non-contact anterior cruciate ligament (ACL) tears are prevalent in young performers in jumping and landing sports. ACL tears increase during adolescence, peaking between 14-16 years. Impact forces and lower extremity positioning may influence the ACL tears. PURPOSE: To examine age and augmented feedback on vertical ground reaction force (vGRF) and knee to ankle (K:A) ratio during landing. METHODS: 126 female athletes (ages 12-17 yrs) landed from a 50 cm height onto two custom force platforms with and without feedback related to vGFR, vGFR symmetry, and lower extremity position using frontal plane digital video. Participants were divided into groups based on age. Feedback was provided using peak vGRF in body weight, a bar graph displaying peak vGRF on each plate and a review of frontal plane video of the landing. 6 trials were taken for the following conditions: baseline, 2 training blocks with feedback, post feedback, and a transfer task. The average vGRF and K:A ratio were reported for each trial block. RESULTS: A repeated measures analysis of variance was used to compare data from baseline, post feedback, and transfer task data on each variable. Differences in vGRF were observed between baseline, post-feedback, and transfer averages ($p<.001$). Differences were shown for K:A ratios between baseline, post-feedback, and transfer trial ($p<.001$). No differences were found between the different age group for either variable ($p>.05$). CONCLUSION: Post trial augmented feedback appears to produce similar changes across age groups in vGRF and K:A ratio across time (baseline, post feedback and transfer).

D.G.42 Trauma-Informed Practice: Exploring Teacher Attitudes to Promote Safe Schools

Brianna Swarm
Co-author: Robert Dixon
Mentor: Robert Dixon, Psychology

Trauma in childhood can lead to numerous negative outcomes, such as reduced attendance, academic difficulties, increased behavioral difficulties, and more. Teachers can create safe environments and reduce negative effects of trauma by implementing trauma-informed practices (TIP). However, teachers' attitudes toward TIP can be a barrier to implementation or encourage it. This study explores the differences between teacher experience and school location on teacher attitudes towards trauma-informed practices. Results will be discussed.

D.G.43 Central and Peripheral Hemodynamics during Squat and Leg Press

Justin Maxted and Josie Hower
Co-author: Salvador Jaime
Mentor: Salvador Jaime, Exercise & Sport Science

Arterial stiffness (AS) and blood pressure (BP) responses can help indicate disease or be used to predict cardiovascular complications. Many studies report that AS and BP increases with resistance exercise, but few investigate how different intensities and modalities acutely impact this. Understanding acute differences in BP responses could help progress resistance programming for CVD patients. The purpose of this study is to compare the responses of differing intensities during leg press vs. squat resistance exercises on central and peripheral hemodynamics. This study will include 12 apparently healthy adults between the ages of 18 and 40. There are 6 trials, the first two involve maximal strength tests (1RM) in both squat and leg press. The remaining four trials, randomized, will consist of doing 15 reps at 60% 1RM and 8 reps at 80% on both leg press and squat. During all trials, measures of AS and BP (AtCor's SphygmoCor) will be taken at baseline, following a standardized warmup, between each set, and following the exercise session. Sessions will be separated by a 7-day period. Data collection and analysis are ongoing.

Oral Session A1
8:50 am-9:15 am

O.G.1 DNA Extraction Protocols for Formalin-Fixed Fish and Comparative Genetic Analyses of Disjunct Southern Brook Lamprey *(Ichthyomyzon gagei)* Populations

Erin Brino
Co-authors: Todd Osmundson, David Schumann, Calvin Rezac (Mississippi Museum of Natural Science), and Robbie Ellwanger (Mississippi Museum of Natural Science)
Mentors: Todd Osmundson and David Schumann, Biology

Non-game fish species, particularly lamprey species, tend to receive limited attention with research and conservation focused on species of economic value. Southern Brook Lamprey, predominantly occur in southeastern United States with disjunct populations in Minnesota and Wisconsin. Morphological efforts have not resolved the taxonomic status in Wisconsin, despite notable differences, indicating the need for genetic studies for taxonomic clarification. However, specimen preservation using formalin and limited access to fresh genetic samples, limits classification efforts; updated DNA retrieval methods may provide new insight. For museum specimens, I aim to develop a protocol that isolates sufficient DNA from formalin-fixed fish specimens. To better understand the taxonomic status of the northern populations I will examine morphometric and meristic characteristics of two populations, and use reduced-representation genome sequencing to describe genetic similarity between Southern Brook Lamprey in Wisconsin and Mississippi. Tissue samples from Southern Brook Lamprey, Slimy Sculpin, and Brown Trout specimens were collected for comparative formalin extraction techniques, while Wisconsin lamprey were sampled within three watersheds with tissue samples extracted from the gills. This research could increase the value of museum specimens, provide new insight into evolutionary relationships of distinct Southern Brook Lamprey populations, and inform conservation efforts for fish in Wisconsin.

Oral Session A2
9:20 am-9:45 am

O.G.3 Dissolved Organic Carbon Dynamics in Lakes and Streams in Northern Wisconsin

Vanessa Czeszynski
Co-author: Eric Strauss
Mentor: Eric Strauss, Biology

Dissolved organic carbon (DOC) is a naturally occurring form of carbon; however, various aspects of global climate change have resulted in an increase in anthropogenic DOC in freshwater systems. DOC has unique properties that often stain the water within the system to appear yellow, brown, or even red in some cases. This phenomenon is known as "browning," and can impact many biological and chemical processes within freshwater systems. Here we focus on lakes and streams in Northern Wisconsin to 1. determine DOC concentration and composition in these systems, 2. compare DOC dynamics between system types and each month sampled, and 3. determine if relationships exist between DOC and nutrient quantities and microbial community production. This study found that DOC ranged from 2.62 - 61.35 mg/L, with no significant differences in DOC concentrations between the system types or months sampled. However, DOC composition differed greatly between system type and months ($p < 0.001$, ANOVA). While there were no significant differences in chlorophyll production between the two system types, there was in heterotrophic bacterial secondary production ($p = 0.02$, ANOVA). While this study captures a small snapshot of the Northern Lakes and Forests region, it lays the foundation for further research to be conducted to better understand DOC dynamics and browning as climate change persists.

Oral Session B1
9:55 am-10:20 am

O.G.4 From Exploration to Discovery: Increasing Accessibility to Leisure and Recreation Education

Sasha Mader
Mentors: Kate Evans and Brian Kumm-Schaley, Recreation Management & Therapeutic Recreation

Students entering leisure and recreation programs in higher education often share a similar narrative: their discovery of leisure studies was a feat of exploration, happenstance, or introduction via a personal connection. Mary Parr, Ph.D shared in her article Recruiting Others to the Park and Recreation Profession (2005) that careers in recreation are often not considered by students, and that they do not "enter their consciousness as an occupational field like accounting, systems analysis, nursing, or teaching. Parks and recreation is widely known as a 'discovery major'—students stumble upon it either through friends, roommates, or thumbing through the course catalog" (p.75). Furthermore, a study conducted by Complete College America (2012) discussed the importance of an early and clear path to graduation as one of the most effective ways for higher education systems to address equity gaps in degree completion stating that "Students need support to choose the right pathways and they need to be put directly on those pathways" (p.14). This project aims to assess the efficacy of the efforts of the Department of Recreation Management and Therapeutic Recreation (RMTR) to bridge the discovery major gap while simultaneously benefiting underserved populations by reducing time to degree attainment.

FACULTY & STAFF ABSTRACTS

Poster Session A
8:50 am-9:45 am

A.F.60 Coping with a Crisis: The Intersection of Spirituality and Social Media

Karen Skemp, Public Health & Community Health Education
Co-authors: Michele Pettit and Patrick Barlow

Spirituality includes a sense of connection to something bigger than ourselves and may become prominent when an individual confronts emotional stress, physical ailments or mortality. Resilience refers to the ability to bounce back when presented with challenging situations. COVID-19 presented a challenging situation for people across the globe. To that end, the purpose of this study was to examine the spiritual coping strategies and the impact of social media on stress, depression, anxiety, and resilience among a campus community during the COVID-19 pandemic. Faculty, staff, and students completed an online survey consisting of items from the Spiritual Coping Strategies Scale, a revised version of the Facebook Intensity Scale, the Depression, Anxiety, and Stress Scale, and the Brief Resilience Scale. Pearson correlation analyses were performed to assess relationships. Higher spiritual coping strategies were associated with lower depression, anxiety and stress scores and higher resilience. Social media use was associated with increased levels of anxiety, depression, and stress and decreased resilience. Fostering resilience depends largely on having a strong spiritual connection or social network consisting of supportive family and friends. As a way to improve mental health, we suggest that students, faculty, and staff explore alternative approaches beyond social media to establish meaningful personal and spiritual connections.

Poster Session C
11:00 am-11:55 am

C.F.60 The Acquisition of Voiceless Plosive Segments in L2 Spanish

Antonio Martin-Gomez, Global Cultures & Languages
Co-author: Maighdlin McHugh (University of Wisconsin-Stevens Point)

We present the results of an experiment on the acquisition of Spanish voiceless plosive consonants / p t k / by a group of adult native English speakers (N = 12) who received class instruction with additional practice from native Spanish students in a virtual pronunciation tandem. A read-aloud task in three phases (pre-, post-, post post-) was conducted to measure possible improvements in the pronunciation of these consonants, by examining decreases of voice onset times (ms.) when pronouncing these consonants in word-initial positions, as in que 'that', tienen '(they) have' and problema 'problem'. Results show overall improvements as a result of explicit instruction in class and exposure to native input by the Ecuadorian peers, but only significant improvements were evident in / k /. As in previous studies, exposure to native input at discrete points throughout the semester facilitates the articulation of foreign sounds.

Oral Session C1
11:00 am-11:25 am

O.F.8 Tracking Student Learning Outcome Engagement by Librarians at the Reference Desk

Michael Current, Library

Several years ago, the Library department adopted a set of programmatic student learning outcomes (SLOs) that we aspire for undergraduates to achieve over the course of their academic career at UWL. Without the structure of a formal academic program of our own, measuring the extent to which we are reaching the entire student body is difficult, as is the incorporation of formal assessment of student learning relative to our SLOs to improve our effectiveness as librarians. While our most visible approach to teaching is our information literacy instruction program, consisting primarily of standalone visits to the classroom at the invitation of course instructors, we have considered all avenues of librarianship (collection development, cataloging, instruction, reference and more) to be important components of our overall effort. In reference, where librarians provide on-demand information research assistance, we have now collected several years' worth of data tracking the incorporation of teaching relative to our departmental SLOs into these direct interactions with students. The data revealed hidden and sometimes surprising patterns in our teaching that could be used for more strategic distribution of SLO emphasis across librarianship specialization areas. The data also highlight opportunities for targeted assessment of student learning relative to our SLOs in reference.

2022 RECIPIENTS OF STUDENT RESEARCH GRANTS

2022 RECIPIENTS OF UNDERGRADUATE RESEARCH AND CREATIVITY GRANTS

Name	Department	Mentor	Title
Kirsten Amann	Archaeology & Anthropology	Heather Walder	Refining the Timeline of Indigenous Occupations at Frog Bay Tribal National Park
Reed Anderson	Chemistry & Biochemistry	Daniel Grilley	Structural Characterization of a Toxic Protein
Caleb Andrews & Katie Johnston	Biology	Jaclyn Wisinski	The Effect of Breast Cancer Cell Releasates on Megakaryocyte Proliferation
Jozie Arenz, Delaney Klawitter, & Hunter Weik	Biology	Sierra Colavito	Receptor Interaction in Stem-Like Breast Cancer
Samantha Baumgartner & Jaydin Romalia	Geography & Earth Science	Joan Bunbury	Charcoal Analysis of a Sediment Core from Mud Lake, WI
Elijah Behnke	Chemistry & Biochemistry	Sujat Sen	Synthesis of Nanofluidic Suspensions with High Solid Loading and Low Viscosity for Carbon Dioxide (CO2) Conversion
Edith Ben-Eboh	Biology	Alder Yu	Glucose Regulation in *Drosophila melanogaster* with Mutated Period Gene
Jenna Blomquist	Microbiology	William Schwan	Examination of *fimB* Point Mutations on *fimB* Transcription in Uropathogenic *Escherichia coli* Growing in an Acidic Environment
Martin Bond	Chemistry & Biochemistry	Sujat Sen	Study of Microporous Layer Composition of Substrates for Use in Gas-Fed CO2 Electrolysis
Kathleen Casella & Alexis Ashe	Psychology	Grace Deason	Disorders, Danger, and Decisions: The Interaction of Gender and Schizophrenia in the Courtroom
Aidan Cowley	English, Political Science & Public Administration	Bryan Kopp; James Szymalak	Rhetoric, Speech Acts, and the First Amendment: UWL Student Perceptions Towards their Right to Free Speech on Campus
Brice Durocher	Chemistry & Biochemistry	Kelly Gorres	Epstein-Barr Viral Reactivation and the Influence of Angelic and Tiglic Acid
Brice Durocher	Chemistry & Biochemistry	Kelly Gorres	The Effect of Leucine Metabolites and Epstein Barr Virus Lytic Cycle Activation
Sage Erickson	English	Bryan Kopp	Video Game Interfaces as Genres
Jacob Feinas	Mathematics & Statistics	Melissa Bingham	How does Payroll and Team Retention Affect Success in the NHL
Sarah Fenn & Lukas Bekkedal	Exercise & Sport Science	Jacob Caldwell	Passive Stretching as a Method to Increase Muscle Oxidative Capacity and Lower Arterial Stiffness in Peripheral Arterial Disease

Name	Department	Mentor	Title
Samuel Flaig & Aaron Murphy	Biology	Ross Vander Vorste	Analysis of Invertebrates: Identification of Aquatic Insects on Collection Samples from the Upper Mississippi River
Sarah Fleegal	Microbiology	William Schwan	Examining the Effects of *brpR* Point Mutations on Transcription of the *srtA* Gene in *Staphylococcus aureus*
Sean Floersch	Mathematics & Statistics	Chad Vidden	Using Linear Regression to Predict Game Results in Major Sports Leagues, including the NBA, NFL, NHL, and MLB
Grace Gehrke	Biology	Cord Brundage	*Streptobacillus moniliformis* (Rat-Bite Fever) in Thirteen-Lined Ground Squirrel (*Ictidomys tridecemlineatus*)
Allyson Goeden & Jill Kittelson	Mathematics & Statistics	Barbara Bennie & Douglas Baumann	Relating Patterns in the Mathematics & Statistics Section of the Murphy Learning Center Usage to Student Success
Benjamin Graham	Biology	Todd Osmundson	Strain Improvement of the Edible Mushroom *Pleurotus eryngii* Using Two Methods of Mutagenesis
Nathaniel Green	Mathematics & Statistics	Edward Kim	Continued Work on the CDTA Conjecture
Megan Gregory	Chemistry & Biochemistry	Todd Weaver	Connecting Clinically Observed Metabolic Deficiencies to Protein Structure and Function
Erin Greschner	Psychology	Alessandro Quartiroli	Investigating the Role of Coaches on Student Athletes' Mental Health
Noelle Hackenmueller	Global Cultures & Languages	Kimberly Morris	From Uncommon to Familiar: The Evolution of Language Teachers' Experiences During and Beyond the COVID-19 Pandemic
Clara Hance	Exercise & Sport Science	Eileen Narcotta-Welp	Inclusion's Limits. Layshia Clarendon's Presence (or Lack Thereof in the WNBA)
Cole Hawkins	Biology	Cord Brundage	Observation of Tadpoles in Response to Constant Ethanol Exposure
Karin Hayford	Biology	Cord Brundage	Effect of Nicotine Exposure During Development on Breathing Responses in Tadpoles
Miryah Henriksen	Chemistry & Biochemistry	Valeria Stepanova	Analysis of Keto-enol Tautomerization of Novel Curcuminoids Using Combinatory Theoretical and Experimental Approaches
Miryah Henriksen	Chemistry & Biochemistry	Valeria Stepanova & Heather Schenck	Study of Keto-Enol Tautomerization of Several Asymmetric Curcuminoids in Different Biologically-Like Environments Using NMR Spectroscopy
Colby Hietpas	Biology	Eric Strauss	Microplastic Ingestion by Zebra Mussels (*Dreissena polymorpha*) in the Upper Mississippi River: Is Location Within the River and Time an Important Factor?
Gavin Hutchison	Biology	Alder Yu	Effects of Alzheimer's Disease on the Ability to Reset Circadian Clocks

Name	Department	Mentor	Title
Abram Jackson, Emily BonoAnno, & Benjamin Metzdorf	Biology	Scott Cooper	Effect of Platelet Cold Storage on Protein Phosphorylation
Maya Jahnke	Biology	Alder Yu	Feeding Behaviors and Food Preference of *Drosophilia melanogastor* with Abnormal Circadian Rhythmicity
Mitchell Johnson	Mathematics & Statistics	Edward Kim	The Superellipse Conjecture
Faith Kalvig	Archaeology & Anthropology	Heather Walder	Collaborative Historical Archaeology at the Pageant Grounds site in Red Cliff, Wisconsin
Jeanna Kedrowski	Biology	Jennifer Miskowski	Investigating the Mechanism of Action in Novel Anthelminth, CL-5
Travis Key	Geography & Earth Science	Colin Belby	Mapping Pre-Restoration Conditions and Historical Stream Change Along Plum Creek in Southwest Wisconsin
Abby Klecker & Matthew Wright	Biology	Sumei Liu	Regional Difference in Stress-Induced Disruption of Intestinal Epithelial Barrier Function
Dillon Koestler	Mathematics & Statistics	Barbara Bennie	Positional Spending in the NFL and Its Impact on Winning
Joshua Krause	Biology	Jaclyn Wisinski	Activation Mechanism and Regulation of Small GTPase Rap1b
Madelyn Kruser	Biology	Jennifer Klein	Antimicrobial Activity of Plants Used in Traditional Hawaiian Medicine
Abby Kuna & Linnea Lerwick	Psychology	Ellen Rozek	Effects of Stereotype Threat on Executive Function in Adults
Josie Lammers	Chemistry & Biochemistry	John May	Investigating the Role of Positively Charged Surface Residues of a Salmonella Copper Resistance Protein
Josie Lammers	Chemistry & Biochemistry	John May	Investigating the Importance of the Membrane Tether of a Salmonella Copper Resistance Protein for Function
Taryn Lang	Biology	Anne Galbraith	Effects of Copper Chelator Bathocuproine Disulphonate (BCS) on Yeast Growth after SK-03-92 Treatment
Leah Leonard	Psychology	Bianca Basten	Obese and Healthy? The Relationship between Body Size and Symptomatology on Perceptions of Health
Abby Lewis	Microbiology	Paul Schweiger	Display of Amylases on the Surface of *Gluconobacter oxydans* to Enable Starch Utilization
Brenna Lundgren	Biology	Alder Yu	Bacterial Variation in the Commensal Microbiome of PER-Deficient *Drosophila melanogaster* Fruit Flies
Samantha Lyons & Janny Fonk	Biology	Jennifer Klein	Antimicrobial Activity of Plants Used in Traditional Hawaiian Medicine

Name	Department	Mentor	Title
Courtney Masarik	Chemistry & Biochemistry	Aric Opdahl	Lowering the Detection Limit for Quantifying DNA/RNA Fragments By Temperature Dependent Surface Plasmon Resonance
Audrey Mattmiller, Devin Woodcock, & Brooklyn Swenson	Biology	Jaclyn Wisinski	Determining the Effect of Breast Cancer Releasates on Megakaryocyte Susceptibility to Apoptosis
Halle McCormick	Biology	Alder Yu	Genetic Disruption of Circadian Rhythm and its Effects on DNA Repair
Brandon Micech	Finance	Adam Stivers	Security Selection Model for the Gordon Spellman Fund Phase 2
Julia Milne	History	Ariel Beaujot & Victor Macias-Gonzalez	LGBTQ+ History in La Crosse - A Podcast Series
Keta Oettinger, Tristan Pittman, & Peyton Kurtz	Biology	Jennifer Klein	Identifying Key Species to Primary Plant Succession in Kona, Hawaii Using DNA Barcoding
Ashton Osterhaus & Eva Sundquist	Biology	Jennifer Klein	Determining Habitat Preferences and Locations of *Achatina fulica* Infected by *Angiostrongylus cantonensis*
Andrew Otto	Physics	Steven Verrall	Charge Radius and Mass Distribution of Ground State Quantum Vortex Deuteron
Hannah Pamperin	Biology	Cord Brundage	*Streptobacillus moniliformis* Testing and Clinical Management in Ground Squirrels
Katelyn Phelps	Chemistry & Biochemistry	Daniel Grilley	Understanding the Secretion of a Toxic Protein through Templated Protein Folding
Morgan Priem	Chemistry & Biochemistry	Daniel Grilley	Determining the Effects of Poly-A Tracts and Monovalent Ions on Nucleosome Equilibrium and Dynamics
Aly Reuvers	Biology	Eric Strauss	Metabolic Analysis of Freshwater Ecosystems Monitored by the National Observatory Network
Maddie Riddle	Sociology & Criminal Justice	Nick Bakken	Minimizing Risk upon Release: Risky Sexual and Drug Abuse Behavior among Formerly Incarcerated Women
Alexis Ringhofer & MacKenzie Caya	Biology	Scott Cooper	Effects of Oxidized LDL on Platelets after Cold Storage or Hibernation
Jon Robinson	Archaeology & Anthropology	Elizabeth Peacock	A Comparative Analysis of Organic Farming Practices and Attitudes in the United States and France
Anna Roewe	Psychology	Jason Sumontha	Perception of Women and Likelihood for Reporting Sexual Harassment
Allison Ronk	Microbiology	Dan Bretl	Characterizing the Importance of Phosphorylation for a Novel Two-Component System with NmpR Constitutively "on" Mutations in *Myxococcus xanthus*

Name	Department	Mentor	Title
Madeline Ross	Chemistry & Biochemistry	Kelly Gorres	Effect of Aripiprazole on Leukemia-Inhibitory Factor and Epstein-Barr Virus
Caroline Sargent	Biology	Sumei Liu	Sex Differences in the Role of CRF1 and CRF2 Receptor in Stress-induced Increases in Intestinal Permeability
Pearl Scallon	Biology	Todd Osmundson	Microbial Communities Associated with Freshwater Algal Blooms in the Upper Mississippi River
Mikaela Schneider	Sociology & Criminal Justice	Nick Bakken	Educational Aspirations vs. Attainment: The Effect of Parental Factors on Education Achievement
Lydia Schult, Sara Scala, & William Murphy	Biology	Margaret Maher	Serum Ferritin, Calcidiol, and Hepcidin Responses to Vitamin D Intake from Various Sources
Paige Schwonek & Aubrey Schwonek	Biology	Jennifer Klein	Macro and Microplastic Surveying along the Shores and Beach of Hawaii's Big Island
Bennett Shiller	Psychology	Alexander O'Brien	How to Normalize Eating Fungus Again: The Impact of Educational Content on the Acceptance of Therapeutic Psychedelic Use
Ryan Sperling	Political Science	John Kovari & Regina Goodnow	Going for Gold: A Case Comparison Between La Crosse and Madison and Framework for Increased Bikeability
Mackenzie Taylor	Psychology	Tanvi Thakkar	The Impact of Distractors on a Cognitive Processing Task: Implications for the ADHD Population
Owen Thompson	Chemistry & Biochemistry	Kelly Gorres	Crystal Screening of a Cancer-associated Protein
Owen Thompson	Chemistry & Biochemistry	Kelly Gorres	Lysis of Bacteria with an Insoluble Protein in a Cancer-associated Herpesvirus
Ava Tollas	Psychology	Berna Gercek Swing	“We’re All in this Together”: Social Support and Belongingness on a College Campus
Damon Trump	Chemistry & Biochemistry	Kelly Gorres	Point Mutational Analysis of Murine Gammaherpesvirus 68 as a Model for Epstein-Barr Virus
Damon Trump	Chemistry & Biochemistry	Kelly Gorres	Novel Approach to the Purification of MHV68 ORF48 through Use of Reducing Agents
Gage Valeri	Biology	Eric Strauss	Isotopic Signatures between Biofilms and Grazers on Wood and Rock Substrates within the Upper Mississippi River
Ben Walker	Chemistry & Biochemistry	Kelly Gorres	Determining the Development of Reactive Oxygen Species in Burkitt Lymphoma Cells during the Reactivation of the Epstein Barr Virus via Lipid Peroxidation and RT-qPCR

Name	Department	Mentor	Title
Ben Walker	Chemistry & Biochemistry	Kelly Gorres	The Effect of Lithium Acetoacetate and Sodium 3-hydroxybutyrate on Epstein Barr Virus Lytic Cycle Reactivation and PPARA Gene Expression
Hailey Willner	Biology	Anne Galbraith	How Melatonin Affects Yeast Growth after Treatment with Antimicrobial SK-03-92
Jamin Wolfe	Archaeology & Anthropology	Amy Nicodemus	The Organization of Population: What Can Geophysical Survey and UAV DEM Modeling Combined with Ground-Truthing of Selected Areas Tell Us about Intra-Site Population Organization at Rabe Anka-Siget?
Cassie Zehr	Chemistry & Biochemistry	Daniel Grilley	Investigating the Structural Dynamics of a Hemolytic Protein
Jared Zwettler	Political Science & Public Administration	Anthony Chergosky	The Impact of Argument Framing: An Investigation of the Impacts of Framing Effects on Public Opinion of Wealth Taxes and Income Inequality Policies

2022 RECIPIENTS OF THE GRADUATE RESEARCH, SERVICE, AND EDUCATIONAL LEADERSHIP AWARDS

Name	Program or Department	Faculty Sponsor	Title
Erin Brino	Biology - Aquatic Science	Todd Osmundson	Geographic Relict Species: A Genetic Study of Southern Brook Lamprey (*Ichthyomyzon cf. gagei*) in the Upper Midwest and Southern United States
Evan Chalmers	Biology	Anita Davelos	Methods of Invasive Species Control in Establishing Prairies
Matthew Chen	Biology - Aquatic Science	Eric Strauss	Comparison of Epixylic and Epilithic Biofilm Development in Two Upper Mississippi River Habitats
Brilley Dall & Lauren Zimmerman	Clinical Exercise Physiology	Salvador Jaime	Effects of Short-Term L-Citrulline Supplementation on Arterial and Metabolic Function During Cold Pressor and Submaximal Cycling in Older Adults
Emily Day	Athletic Training	Naoko Giblin	Relationship among Running-related Load, Race Performance, and Injury Incidence
Tayler Farrington	Microbiology	Paul Schweiger	Fructose Dehydrogenase Purification and Characterization in the Pursuit of Creating a Fructose Biosensor
Anya Jeninga	Biology	Tisha King-Heiden	Neonicotinoid Toxicity of Singular and Binary Exposures on the Aquatic Vertebrate *Pimephales promelas*
Alissa Koenke	Clinical Exercise Physiology	Jacob Caldwell	Large and Small Blood Vessel Responsiveness to a Nitrate Supplement in Hypertensive, Postmenopausal Women
Dannira Kulenovic	Biology	Sierra Colavito	Using AXL Inhibitors to Overcome Resistance to CHK1 Inhibition in Triple Negative Breast Cancers
Duresa Kumbi	Clinical Exercise Physiology	Kimberley Radtke	Use of Terminal RPE during Rockport Walking Test to Predict VO2max and VT in Sedentary Individuals with BMI>25
Ethan Joel Larsen	Clinical Microbiology	Jennifer Klein	Exercise-Induced Extracellular Vesicle Impact on RAW 264.7 Macrophage Polarization
Emma Malooly	Clinical Exercise Physiology	Ward Dobbs	The Influence of Olympic Weightlifting Derivatives on Sprint Performance
Kristina Morben	Biology	David Schumann	Lake Chub (I) Movement Patterns in a Single Isolated Stream in the Black Hills of South Dakota
Jadon Anthony Motquin	Biology-Aquatic Science	David Schumann	Evaluation of Zooplankton Abundance and Richness in Determination of Lake Sturgeon Acceptance to Feeding Regimes
Samuel Munk	Biology - Aquatic Science	Eric Strauss	Assessing Microplastics in Three Fish Species of the Upper Mississippi River
Jason Tendler	Biology	Markus Mika	Parental Provisioning and Life History of Flammulated Owls

PRESENTER INDEX

A, B, C, D are the poster sessions
A=Asynchronous; S=Synchronous
P= Poster; O=Oral Presentations; E=Exhibits
F=Faculty & Staff; G=Graduate Students; U=Undergraduate Students

NAME	ABSTRACT(s)	NAME	ABSTRACT(s)
Faude, Charlie	B.U.7	Hersh, Ben	A.U.12
Faun, Rene	A.U.26	Hertel, Michael	B.G.47
Feinas, Jacob	C.U.15	Hickcox, Ethan	B.G.52
Fenn, Sarah	A.U.18, B.U.8, C.U.9, D.U.8	Hierl, Kellie	A.U.12
Ferguson, Louden	O.U.15	Hietpas, Colby	D.U.1
Field, Kaylyn	A.U.28	Hile, Lexie	A.U.17
Fischbach, Abby	B.G.42	Hoff, Anthony	A.U.18
Flaig, Samuel	C.U.2	Hoffman, Chris	A.U.19
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Fleischmann, Abigail	D.U.13	Howell, Amanda	C.U.19
Floersch, Sean	A.U.4, O.U.5	Hower, Josie	D.G.43
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Kulenovic, Dannira	C.G.50	Neubauer, Coral	B.U.25
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COMMENTS OR SUGGESTIONS?

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