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May 1, 2020

ReCS 2020 in Canvas

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

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UNDERGRADUATE STUDENT ABSTRACTS

Poster Session A
8:50 am – 9:55 am

AP.U.1 Predicting the Winner of a Tennis Match

Maura Anderson
Mentor: Sherwin Toribio, Mathematics & Statistics

This paper develops a model used to predict the winner of a US Open tennis match. We developed models for both men and women using data from the US Open between the years 2014 and 2019. Various player attributes were considered, and a step-wise linear regression method was used to determine the attributes that were significant. The resulting logistic model employs only three variables while maintaining an accuracy level of approximately 75%.

AP.U.2 Maximizing Overexpression and Solubility of a Protein of Unknown Form in the Kaposi's Sarcoma Associated Herpesvirus (KSHV)

Arini Arsana
Mentor: Kelly Gorres, Chemistry & Biochemistry

Kaposi's Sarcoma-Associated Herpesvirus (KSHV) falls under the Gamma herpesvirus subfamily of herpesvirus that infects people around the world. KSHV is linked to blood vessel cancer called Kaposi Sarcoma (KS), Multicentric Castleman's Disease (MCD), and other lymphoproliferative diseases, such as Primary Effusion Lymphoma (PEL). Similar to all Herpesvirus, KSHV is capable of proliferating during their active lytic stage but can also survive within their host during the inactive latent phase. Open Reading Frame 48 (ORF48) is a protein in the Kaposi's Sarcoma-Associated Herpesvirus. ORF48 has an unknown function and purpose. However, ORF48 is predicted to serve a vital role in all Gamma herpesvirus. To optimize the study of KSHV, the soluble form of ORF48 protein in the cell-free extract solution (CFE) will need to be produced in mass quantities. Creating a mass quantity of KSHV ORF48 protein can be done by optimizing the method of protein overexpression, then cell lysis. Increasing the efficiency of producing soluble ORF48 protein will be useful for further studies of KSHV. The ability to produce soluble ORF48 protein will then open the door for further studies on how KSHV infects humans.

AP.U.3 Relationship between Maximal Mean Power in a Jump Shrug and Its Correlation to Jump Height, Mean Velocity, and %1RM Maximum Back Squat

Ally Brugler
Co-author: Molly Lyngaas
Mentor: Ali Berry, Exercise & Sports Science

The jump shrug is a common exercise used to improve lower body power production, which has an impact on overall sports performance. However, because most studies determining optimal load of the jump shrug use the percent one rep max (%1RM) of the hang clean it becomes problematic to prescribe specific loads for training if 1RM testing of the hang clean is not performed. This study aims determine optimal load of the jump shrug based on relationships between jump height, mean velocity, percentage of body weight and 1RM back squat at maximal mean power during the jump shrug between many participants. Twenty football players from the University of Wisconsin-La Crosse performed three maximal effort repetitions of jump shrugs. Each set increased the load by a 5% increment of their respective 1RM back squat value until maximal mean power was reached. Results indicated that participants achieved maximal mean power when mean velocity was $(1.05 \pm 0.14 \text{ m}\cdot\text{s}^{-1})$, jump height was $(18.7 \pm 3.8 \text{ cm})$, $r= 0.524 \text{ .xx}$, $p= 0.018 \text{ .xx}$ and at $(56.7 \pm 8.5\%)$, $r=-0.639 \text{ .xx}$, $p=0.002 \text{ xx}$) of their 1RM back squat. Therefore, there is moderate evidence that the optimal power load of a jump shrug can be estimated by using the load that allows the jump height at the highest mean velocity of ~19 cm, or ~55% 1RM back squat. These results could be used to estimate optimal load for athletes performing a jump shrug when a 1RM hang clean is not determined.

AP.U.4 Contribution of the AXL Receptor in Promoting Resistance to CHK1 Inhibitor Therapy in Breast Cancer Stem-like Cells

Mitch Bunting

Co-author: Danielle Karch

Mentor: Sierra Colavito, Biology

Claudin-low (CL) breast cancer is a sub-type of breast cancer for which there are no currently available targeted therapies. CL breast cancer is highly metastatic and aggressive, owing to its high proportion of cancer stem-like cells. Recently, the lab has determined that CL breast cancer cells are sensitive to inhibition of CHK1, an enzyme involved in the cell-cycle. While this presents a promising targeted treatment option for patients with CL breast cancer, in the clinical setting resistance to targeted therapies is common. To investigate this, CL cells with resistance to CHK1 inhibitors were generated in the lab, and they were found to have enhanced signaling through the AXL pathway. AXL has been shown to promote cell proliferation, survival, and resistance to therapy in several cancer types, but no one has yet shown a link between AXL and CHK1. We are investigating DNA damage levels in cells treated with the CHK1 inhibitor alone, the AXL inhibitor alone, or the combination treatment. Our preliminary data suggest that the addition of an AXL inhibitor overcomes the resistance to the CHK1 inhibitor in terms of DNA damage restoration.

AP.U.5 Transcriptional Analysis of *Staphylococcus aureus* Biofilm-Associated Genes in a Regulatory Protein Mutant Strain

Lauren Carstensen

Mentor: William Schwan, Microbiology

Staphylococcus aureus is the most common cause of skin/soft tissue and heart valve infections in humans. A number of these infections are biofilm-associated and therefore are difficult to treat with antibiotics. Previous work in the laboratory identified a putative two component regulatory system comprised of BrpS (a sensor kinase) and BrpR (a response regulator) that we believe regulates transcription of *lrgA* that encodes an anti-holin protein involved in *S. aureus* biofilm formation. To determine if the BrpS and BrpR proteins may regulate transcription of *lrgA*, a quantitative real-time polymerase chain reaction (qRT-PCR) technique was used to examine transcriptional differences between the unmutated parent strain, a *brpS* mutant, and a *brpS* mutant that has the unmutated *brpS* gene added back on a plasmid. Several RNA preparations were made from each strain, converted to cDNAs, then used in qRT-PCR that targeted the *lrgA* transcripts as well as the *cidA* transcripts that encode holin protein that leads to lysis of the *S. aureus* cells. Transcription of *lrgA* was 25-fold less in the *brpS* mutant strain compared to the parent strain. Transcript abundance returned to a parent strain level when the *brpS* mutation was complemented. Transcription of *cidA* stayed about the same. Our results support our hypothesis that the BrpS/R regulatory system affects transcription of the *lrgA* gene, which in turn would impact the ability of *S. aureus* to form biofilms and cause human infections.

AP.U.6 A Biologically-Inspired Model for Mass Extinction in Genetic Algorithms

Kaelan Engholdt

Mentor: David Mathias, Computer Science

Genetic algorithms (GAs) are approximation algorithms that employ principles of Darwinian evolution to evolve solutions to computationally expensive problems in a shorter amount of time than exhaustively searching for the best solution. GAs maintain a population of solutions for the given problem, and through the use of varying “genetic operators,” the algorithm improves the quality of the solutions in a process analogous to biological evolution. As in biological populations, diversity promotes better evolution. Mass extinction events are just one such technique that can be used to improve the diversity of a population, whereby a significant portion of the population is eliminated. In biological systems, extinction may be abrupt (volcanoes, asteroids, etc.) or gradual (disease, habitat loss, etc.), but biological studies have shown that the rate of evolution appears to increase post-extinction as survivors evolve to fill the vacated niches while facing decreased competition. Previous extinction models in GAs maintain a static extinction operator that periodically performs extinction, but the utility and biological motivation for this approach may be questionable. In this work, we use a biologically-inspired mass extinction operator to mirror extinction events as they might happen in nature. We examine the operator’s utility and its effect on solution quality.

AP.U.7 Effect of Ornithine on the Lytic Cycle of EBV

Jenna Hayes

Mentor: Kelly Gorres, Chemistry & Biochemistry

Effect of Ornithine on the Lytic Cycle of EBV Epstein Barr Virus (EBV) is a virus commonly associated with cancers. Previous research has shown valproic acid (VPA) to be an inhibitor of the lytic cycle; however, not much is known about the mechanism of how VPA inhibits the lytic cycle. The purpose of this research is to gain insight into the mechanism that allows VPA to inhibit the lytic cycle of EBV. Further investigation into EBV is important because it can lead to possible preventions and treatments. This experiment will explore the possible interactions between the lytic cycle of EBV and the polyamine ornithine. Previous research has found elevated levels of ornithine in the supernatant. Ornithine is involved in the biosynthetic pathway of the production of spermine and spermidine, two other polyamines that were tested. This experiment was conducted using DFMO which decreases levels of ornithine. In addition, varying concentrations of ornithine were tested. It is expected that altering the levels of ornithine in the cells will affect the relative amount of lytic mRNA in each sample. Future experiments will build off of the findings of this experiment in order to continue to discover more about the mechanism of the inhibition of EBV.

AP.U.8 The Role of Large Wood in the Restoration of Habitat in the Upper Mississippi River

Jeffery Henderson

Co-authors: Kathi Jo Jankowski (US Geological Survey), Ross Vander Vorste, Meredith Thomsen, and Roger Haro

Mentors: Meredith Thomsen, Biology; Roger Haro, River Studies Center

Large wood plays an important role in the geomorphology and ecology of river ecosystems. However, the abundance of wood in rivers has declined as a result of the removal for navigation, watershed deforestation, and changes in floodplain connectivity. Although the role of wood is well studied in streams and small rivers, we have limited knowledge regarding the ecology and restoration potential of large wood in large rivers, including the Upper Mississippi River System (UMRS). To fill this gap, we initiated large wood surveys on restored islands in Pool 8 of the UMRS to identify the factors that influence the abundance and turnover of wood. We deployed experimental wood samplers across varying hydrological settings to understand periphyton and macroinvertebrate colonization on wood over time. Preliminary analyses suggest large wood abundance on restored islands may differ due to island age location. Experimental wood substrates indicated greater macroinvertebrate abundance on wood samplers placed in higher flow velocities. We predict our findings will help better understand the ecological role of wood in the UMRS and potentially other large rivers. Such information can be used as a guide for river managers and biologists when making decisions about large wood placement in future restoration projects.

AP.U.9 Mapping Purple Loosestrife at Lake Neshonoc using Deep Learning Classification Technique on Drone Imagery

Ethan Lucas

Mentors: Gargi Chaudhuri, Geography & Earth Science; Niti Mishra, Geography & Earth Science

The aim of this research is to create a specie-level map of vegetation around Lake Neshonoc area using deep learning-based pixel-level image classification on very high resolution (VHR) images acquired by Unmanned Aerial System (UAS, popularly called drones). The target of this classification is *Lythrum salicaria* or purple loosestrife. Purple loosestrife is an invasive species that has made its home in many of the wetlands in Wisconsin, and it is important to monitor and if needed, control this plant. Purple loosestrife can grow in dense clumps and push out native plant species in the process. This has the potential to lower the biodiversity and can also take over the habitats of animals that lived there, further restricting available habitable space for some species of animals. These dense clumps can also make recreational activities such as boating and fishing difficult, taking away from the local economies of the areas affected (Minnesota Department of Natural Resources). The goal of this research is to produce an accurate map of the purple loosestrife which will be useful to take necessary actions to curb further growth of invasive species. This could also provide vital information on whether efforts of reducing this invasive species are effective or not. With the increasing availability of artificial intelligence (AI) and deep learning, application of these technologies to develop detailed and accurate land cover map can be highly beneficial for conservation efforts.

AP.U.10 Structural and Functional Characterization of Fumarase C from Salmonella Enterica

Ryan Maki

Co-author: Eden R. Winga (La Crosse Central Highschool)

Mentors: John May, Chemistry & Biochemistry; Basudeb Battacharyya, Chemistry & Biochemistry

The citric acid cycle is a vital pathway for virulence of facultative bacterial pathogens. Two of these bacteria, *Salmonella enterica* and *Escherichia coli*, pose a major threat for foodborne illness. Here we present the characterization of an enzyme in the citric acid cycle as targets for the development of novel antibacterial agents. Fumarase C catalyzes the reversible reaction of fumarate to malate. Fumarate conversion to malate is a necessary piece of the CAC cycle. *S. enterica* has been shown to lose virulence when the genes encoding its fumarase C enzyme (SeFumC) are knocked out, making this protein a potential drug target against *S. enterica* infections. To gain kinetic and structural knowledge of SeFumC, we have cloned the gene encoding FumC into a plasmid for overexpression. We have purified SeFumC-His using immobilized metal affinity chromatography. We have baseline values of Michaelis-Menten kinetic parameters for the SeFumC. We are investigating the stability of SeFumC folding using circular dichroism. To facilitate structural analysis, we have identified a condition that promotes crystallization of SeFumC. Characterizing the kinetic and structural features of SeFumC will aid in the potential development of future antibiotics that target the citric acid cycle in bacterial pathogens.

AP.U.11 An Optimal Design of a New Freeway System

Alyssa Oswald

Mentor: Huiya Yan, Mathematics & Statistics

The goal of this project is to find an algorithm that will identify the most cost-effective and eco-friendly routes to build a set of freeways connecting the new power plant and the edge of the city. To do this, it involves studying double-weighted graphs, as well as methods for finding the cheapest and eco-friendly paths in a double-weighted graph. In a double-weighted graph, each vertex represents a neighborhood. If two vertices are connected by a double-weighted edge, then that means a strip of freeway can be built to connect the two neighborhoods, where the first weight is the cost of building the freeway and the second weight is the number of trees to be cut down. Our goal is to first find the minimum-cost set of freeways that connects all the vertices, then the eco-friendliest route that minimizes the number of trees needing to be cut down. The methods involved include Kruskal's algorithm and Prim's algorithm. Furthermore, by studying the two algorithms, we will create a new algorithm that can find the optimal route to build our freeway system, which will take both the cost and the damage to the environment into account.

AP.U.12 Lost Worlds: A Look at Underwater Archaeological Sites within the Mediterranean

Mycaiah Palmer

Mentor: Mark Chavalas, History

The Mediterranean has many sites but not all of them are accessible by traditional means. At some sites this has meant the daunting task of excavating while underwater. In this case, a series of excavations of cities dating from about the 9th century B.C.E to 1st century B.C.E are being studied and analyzed to see what we can find out about the life during the time that Thonis-Heracleion in Egypt, Populonia in Italy and Atlit in Israel seaport cities were occupied. Other than mentions of them within literature, most of what we know about these cities has been lost to the sands of time, until archaeologists were able to not only find them but bring the information to the surface and see what we have been missing for hundreds if not thousands of years since they fell beneath the waves.

AP.U.13 Comparison of Marc Pro Recovery System vs. Powerdot Recovery System in the Rated Perceived Exertion and Recovery of Athletes in the Quads

Kyle Pulvermacher and Justin Donkin

Co-author: Andrew Jagim (Mayo Clinic Health System)

Mentor: Joel Luedke, Exercise & Sports Science

PURPOSE: The purpose of this study is to test whether a PowerDot (PD) electrical stimulation machine would be the same or more effective in muscle recovery than a Marc Pro (MP) electrical stimulation machine and a control (C). **METHODS:** Five male ROTC Cadets male and one female Cadet (21 ± 1 years of age) participated in this study. Participants completed a physical training (PT) session followed by a randomize order of PD, MP, or C on separate days with at least 48 hours in between. Vertical jump (VJ) on a jump mat and perceived recovery status (PRS) was collected before PT, after PT, after intervention, and at least 24 hours after the intervention. **RESULTS:** A significant main effect for time was observed for VJ performance ($p = 0.018$) with no significant time and treatment interactions observed for vertical jump performance ($p=0.948$) or Perceived Recovery Status ($p=0.581$). No significant main effects for treatment were found for VJ Performance ($p=0.991$) or PRS ($p=0.706$). **CONCLUSIONS:** The results of the current study indicate that VJ performance improved from T1 to T3 following the PT workout and respective treatment intervention. Similarly, perceived recovery was lower following PT workout but was restored 1 hr. post workout following the treatment interventions. Each treatment intervention appeared to result in comparable effects in the performance and subjective outcomes following the workout.

AP.U.14 Area-Optimized UAV Swarm Network for Search and Rescue Operations

Laik Ruetten

Co-authors: David Feil-Seifer (University of Nevada, Reno), Shamik Sengupta (University of Nevada, Reno), and Paulo Alexandre Regis (Southeastern Louisiana University)

Mentors: David Mathias, Computer Science; Kenny Hunt, Computer Science

Intelligent robot swarms are increasingly being explored as tools for search and rescue missions. Efficient path planning and robust communication networks are critical elements of completing missions. The focus of this research is to give unmanned aerial vehicles (UAVs) the ability to self-organize a mesh network that is optimized for area coverage. The UAVs will be able to read the communication strength between themselves and all the UAVs it is connected to using RSSI. The UAVs should be able to adjust their positioning closer to other UAVs if RSSI is below a threshold, and they should also maintain communication as a group if they move together along a search path. Our approach was to use Genetic Algorithms in a simulated environment to achieve multi-node exploration with emphasis on connectivity and swarm spread.

AP.U.15 Elemental Analysis of Oneota Copper Artifacts

Jennifer Ryan

Mentors: Heather Walder, Archaeology & Anthropology; Constance Arzigian, Archaeology & Anthropology

Until c. AD 1650, cultural groups that archaeologists refer to as Oneota populated the La Crosse locality. After that time, they apparently moved westward, but the reasons for this are unclear. This study investigates how colonial interaction may have contributed to the migration of the Oneota in the 17th century AD by using portable X-Ray Fluorescence (pXRF) to determine the elemental composition of suspected copper artifacts. Portable XRF provides an inexpensive and nondestructive method of determining if the recovered artifacts from these sites were correctly identified as copper, and if so, whether the source materials of the artifacts are of native or European origin. Native copper is known to be relatively pure, whereas European copper is smelted and as a result contains mixtures of other elements. Archaeologists excavated suspected copper artifacts from two pre-contact sites located in southwestern Wisconsin: Valley View (47LC34) and State Road Coulee (47LC176), and a protohistoric site located in eastern Minnesota: Farley Village (21HU2). Preliminary results indicate the presence of European sourced materials at Farley Village, but results from Valley View and State Road Coulee are less clear, suggesting European interaction may not have occurred until after the Oneota moved westward.

AP.U.16 Experimental Explanation of Expedient Bone Tools

Sarah Schmidt

Mentors: Constance Arzigian, Archaeology & Anthropology; Amy Nicodemus, Archaeology & Anthropology

In the Middle Copper Age and Bronze Age (4000 BC- 1600 BC), the Tisza-Maros cultural group settled along the Mureş and Tisza riverbanks in the Carpathian Basin in central Europe. Excavations at the Pecica “Şanţul Mare” settlement conducted by the University of Michigan professors and graduate students from 2005-2016 recovered

expedient bone tools. With the inability to identify all organic remains at the site, my research focused on developing a technique to categorize bone tools with minuscule yet common wear marks. Thus, experimental archaeology has been applied to the creation and use of expedient bone tools, and the identification of their distinctive use-wear patterns. Materials including grog tempered clay, daub, hardwood, wool, and hide were used to produce wear patterns. Each material produced contrasting wear marks; then, using microscopic analysis, the tools were documented with detailed descriptions regarding specific patterns, and the information recorded in a database. Future applications of this database will provide other archaeologists with reference materials to identify different tool technologies during initial excavations.

AP.U.17 Discovery of Small Molecules that Sensitize *Salmonella* to Polymyxin Antibiotics

Michaela Thielen

Mentor: John May, Chemistry & Biochemistry

Salmonella enterica, a major bacterial cause of food-borne illness, can survive in harsh environments due to its ability to sense and respond to toxic conditions. *Salmonella* senses a threatening environment, such as antibacterial conditions produced by the body's immune system, and then activates the expression of genes necessary to survive within that environment. These genes are activated through the use of two component systems. Two component systems consist of an inner membrane-bound histidine kinase and a response regulator protein located in the cytoplasm of the cell. The PhoP/PhoQ two component system is critical for the virulence of *Salmonella* and for *Salmonella* to resist antibiotics such as polymyxin B. Therefore, we tested commercially available small molecules capable of inhibiting the sensory histidine kinase to see if they were capable of sensitizing *Salmonella* to polymyxin B. Indeed, a few small molecules were successful at sensitizing *Salmonella* to polymyxin B. To determine how these molecules decrease polymyxin B resistance within *Salmonella*, we carried out several mechanistic studies. First, we tested whether these small molecules influenced *Salmonella's* outer membrane permeability. This was tested by combining small molecules with vancomycin. Vancomycin is an antibiotic used effectively on gram-positive bacteria that only contain a single membrane, but gram-negative bacteria are intrinsically resistant to vancomycin due to their outer membrane. We found that vancomycin did not impact *Salmonella's* resistance to polymyxin B. These results suggest that the small molecules do not affect outer membrane permeability. We also tested whether these molecules affect expression of PhoP-activated genes. These molecules have been seen to decrease expression of a PhoP-activated gene when transcriptional reporters were used. Using reverse transcription quantitative polymerase chain reaction (RT-qPCR), we found that the small molecules decreased expression of some, but not all, PhoP-activated genes. Overall, our results demonstrate that small molecules can target *Salmonella's* ability to regulate gene expression and resist toxic conditions. This discovery represents a promising new way to develop antibiotic drugs to treat bacterial infections.

AP.U.18 Overweight Stigma: Do Implicit Biases Lead to Explicit Discrimination in Educational Settings?

Nicolle Wein and Megan Johnson

Mentor: Berna Gercek-Swing, Psychology

Overweight people are discriminated against in several domains, including professionally and educationally. In order to examine bias against overweight people we conducted an online experiment testing the effect of deliberate thinking in reducing bias. 141 undergraduates evaluated quality and hire-ability of a standard student resume, which included a photo that varied gender and weight of the target in a between-subjects design. Half the participants in each condition were given the opportunity of deliberation. 14 participants served as the control group, they examined resumes without photos. Our results showed no significant interactions of our variables. Gender ($F(1, 125) = 1.025$, ns.) and overweight status ($F(1, 125) = .002$, ns.) did not show any differences in participants' judgments either. Although this could be due to our insufficient sample size (d varied between .05 to .17 across analyses), it could also be due to a lack of bias to begin with. Our small control group rated the quality of their neutral candidate ($M = 4.14$) marginally lower than the participants in the thin ($M = 4.59$), $p = .075$, and the overweight conditions ($M = 4.59$), $p = .075$, respectively. This seems to support the second interpretation of no bias. However, this interpretation should be considered with caution.

AP.U.19 Mindful or Full Mind?

Karina Weltcheff and Kassidy Veness
Mentor: Bianca Basten, Psychology

Stress is a significant health problem, particularly in college students. Mindfulness meditation has been shown to be beneficial for those who experience high stress levels. Past research has evaluated the positive impacts of brief mindful meditation sessions but has not explored how at-home mindful meditation completed over an extended period of time may help alleviate stress for college students. In this study, college students in the experimental group completed mindful meditation sessions using the meditation app Headspace. Students in the control group listened to “The La Crosse Thinkers” podcast on their mobile devices. The meditation group listened to a ten-minute Basics course session, twice a week for three weeks; and the control group listened to the podcast in ten-minute increments, twice a week for three weeks. Participants reported their heart rate and took self-report surveys evaluating psychological well-being four times throughout the study to track the effect of mindful meditation on college student’s stress, anxiety, positive and negative affect, and mindfulness. With this data, we hope to see that the at-home meditative practice was beneficial for students’ psychological well-being. An easily accessible mindful meditation app could be recommended by on-campus counseling centers as a valuable resource to students struggling with stress and anxiety.

AP.U.20 Investigation into a Protein of Unknown Function from a Cancer-Associated Herpesviruses

Hannah Wheaton
Mentor: Kelly Gorres, Chemistry & Biochemistry

The Kaposi’s Sarcoma-Associated Herpesvirus (KSHV) is a gamma herpesvirus that can cause several types of infections and diseases within its host, including but not limited to Kaposi’s sarcoma (KS), multicentric Castleman’s disease (MCD), and primary effusion lymphoma (PEL). KSHV, like all Herpesviruses, has the ability to reproduce and cause infection in the active lytic phase, but also survive virtually undetected within a host during the inactive latent phase. The protein of interest expressed within the Kaposi’s Sarcoma-Associated Herpesvirus is the ORF48 protein. Not much is known about this protein’s structure or general function within this specific virus, but the ORF48 protein will be studied further by designing and optimizing a protocol to overexpress, purify, and isolate this protein of interest from the rest of the proteins within KSHV. The end goal of this project will be to determine the protein’s characteristics and function, specifically during the lytic phase of infection, from the Kaposi’s Sarcoma-Associated Herpesvirus.

AP.U.21 The Effect of Body Weight Support, Velocity, and Incline on Lower Body Kinematics

Ashley Woltmann and Susan Weiss
Mentors: Naghmeh Gheidi, Exercise & Sports Science; Thomas Kernozek, Health Professions

Antigravity treadmills have become a common rehabilitation device among runners due to the ability to run at a variety of weight supports, velocities, and inclines. This combination allows injured runners to maintain neurological stimulus and training status without intense metabolic costs and high force output. Previously, the effects of weight support and velocity on lower body joint kinematics have been assessed, but not with the additional variable of incline. The main purpose of this study was to assess the effect of body weight (20%, 50%, or 100%), velocity (5, 7, and 9 mph), and incline (0% or 10%) on knee and ankle joint angles. Healthy rear foot strike runners ran 5 trials of 18 randomized conditions that lasted approximately 15 seconds each. A high-speed Panasonic camera at 240Hz recorded the subject’s right side in the sagittal view. LED markers were placed at six lower extremity anatomical landmarks and a Novel Pedar insole system was used to accurately observe initial foot contact. Knee and ankle joint angles were calculated by inverse dynamics using a customized program in MATLAB. The results of this study could help runners and health professionals to alter rehabilitation protocols to reduce future lower body injuries.

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

BP.U.1 E-cigarette Marketing Strategy Effects on Various Market Segments

Jeffery Belteton, Carly Weiss, and Kate Ferrier
Mentor: Nese Nasif, Marketing

This research examines the effects that e-cigarette marketing strategy has on various market segments. The framework of this study is through the close examination of the case of the Juul brand e-cigarette company, who produces an alternative to tobacco cigarettes by packing nicotine salts into cartridges. Juul's purported target market segment was older smokers, with the objective to replace those consumers' tobacco-based cigarettes, and thus, allegedly improve the health of consumers. Upon examination, it was found that Juul also gained an unintended audience of younger, high school and college age consumers. Juul experienced significant growth from 2015 to 2019 and has gained a critical mass of consumer loyalty. By 2018, Juul represented almost three-quarters of the profitable U.S. e-cigarette market. As Juul seemed to be introducing their product as a healthier alternative, the company has found itself with a great deal of unearned publicity that positioned its product as harmful. Furthermore, Juul has been scrutinized by various stakeholders with allegations of the purposeful targeting and advertising to minors.

BP.U.2 Circadian Rhythms in Gut Microbes of *Drosophila Melanogaster*

Teja Bhimavarapu, Haley Castle, Travis Leuzinger, and Shianne Stacy
Mentors: Alder Yu, Biology; Paul Schweiger, Microbiology

Circadian rhythms are 24-hour physical, and behavioral patterns in organisms that are generated by an internal clock. Circadian rhythms contribute to metabolic regulation. Disrupting the circadian rhythm can deteriorate health, leading to diseases such as obesity and type 2 diabetes. In mice, it has been shown that disrupting circadian rhythms can disrupt gut microbiota, possibly contributing to metabolic disease. The objective of this study is to determine whether disrupting circadian rhythms will also disrupt the gut microbiota in fruit flies (*Drosophila melanogaster*). We have showed that the taxonomic composition of the fly gut microbiome changes with time of day, consistent with a response to the host circadian rhythm. Importantly, the microbial rhythms are not seen in flies kept in constant light, which shuts down the fly circadian clock. However, the rhythms were difficult to detect due to the obligate intracellular bacterium *Wolbachia*, a common bacterium found in insects. Our current project is to produce *Wolbachia*-free flies so that the circadian rhythms can be measured more accurately.

BP.U.3 Applied HRM Service-Learning Externship

Morgan Brzank, Jenna Lee, Kaitlyn Robbeloth, Ashley Smits, and Alexa Thurmes
Mentor: Christa Kiersch, Management

The Applied Human Resource Management (HRM) Research Team is partnering with Great Rivers United Way (GRUW) and their 25 partner nonprofit organizations to identify the challenges regional nonprofit organizations face regarding human resource activities and how they can effectively manage these challenges. Nonprofits play a vital role in the community and there are various factors that hinder a nonprofits ability to carry out its mission. To address the major human resource challenges that the partner organizations of GRUW face, the Applied HRM Research Team has an end goal of providing an evidence-based human resource toolkit for these nonprofits. A needs analysis found that the top human resource challenges that GRUW nonprofits face include recruitment, burnout, benefits, and retention. Based off these results, research was conducted in order to create an online toolkit for the nonprofits to utilize. After the nonprofits are given a chance to use our online toolkit, a post-survey will be sent out to analyze the effectiveness of the training. If these nonprofits are provided the right tools to effectively manage their human resource challenges, they will be able to focus on their mission and better the community of La Crosse through their work.

BP.U.4 Effect of Platelet Shape Conformation in Activation and Surface Sugars

Melissa Clement, Carley Laffin, and McKenzie Nisius
Co-author: Kiana Copsiskey
Mentor: Scott Cooper, Biology

Hibernating 13-lined ground squirrels have developed many physiological adaptations to extreme environments. One such adaptation is the fixing of platelets in a rod-shaped conformation and sequestering them in the liver. This study will help determine whether platelets fixed in a rod conformation can be activated by adenosine diphosphate (ADP), giving insight on how 13-lined ground squirrels can hibernate and survive prolonged bodily temperatures of 4–8°C without forming fatal blood clots. Here we show that platelets in a rod conformation cannot be activated by ADP, which could help explain why 13-lined ground squirrels don't form lethal blood clots during hibernation. This can be confirmed by fixing 13-lined ground squirrel platelets that have been stored at 4°C for 24 hours in a rod conformation using Taxol, monitoring the change in surface sugars and the activation of the platelets using a fluorescently labeled fibrinogen, and examining the resulting platelet activation via flow cytometry. This research is significant in humans because human platelets that have been in cold storage even briefly are rapidly cleared by the liver once they are reintroduced to the body, limiting the shelf life of human platelets. The same clearing behavior is not observed in 13-lined ground squirrels, so understanding and mimicking the hibernation adaptations of 13-lined ground squirrels could lead to the development of methods to store human platelets in the cold, extending their shelf life.

BP.U.5 Dissolved Organic Carbon: A link between Vital Processes in Streams and Lakes

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

Dissolved organic carbon (DOC) is a key component of the carbon cycle in aquatic systems. However, recent increases in the atmospheric deposition of DOC is causing staining or browning to occur in freshwater systems which interferes with light dependent biological processes. Colored dissolved organic material (CDOM) can be used to explain the optical properties of organic carbon. The objectives of this study were to determine the range in DOC and CDOM quantity in streams and lakes, and to assess any differences in trends between the two system types. Sampling a variety of stained and unstained systems, we predicted a wide range in DOC and CDOM with a positive relationship between the two parameters. We expected that this relationship would be stronger in lakes, since closed systems allow for longer retention of nutrients and greater decomposition of less-colored DOC with low molecular weight. Surface water grab samples were taken from 54 streams and lakes across the northern highlands region of Wisconsin and the upper peninsula of Michigan. In addition to DOC and CDOM, spectrophotometric properties of water samples were analyzed. In both streams and lakes, the relationship between DOC and CDOM was highly linear, and spectrophotometric properties exhibit a strong relationship with DOC and CDOM. Various samples possessed high values for color relative to DOC and CDOM quantity, which can be caused by the presence of other dissolved materials present in the system, like iron.

BP.U.6 Discovering the Mechanism of Action of CL-5

Julie Fleegal
Mentor: Jennifer Miskowski, Biology

There is widespread drug resistance in parasitic strains of worms that infect livestock. Humans suffer from parasitic worms that are very similar, and it is predicted these strains will also develop a resistance to current commercially available drugs. Therefore, it is necessary to identify new anthelmintic drugs that act in novel ways. A promising drug, CL-5, is a chemical derivative from a parent compound isolated from the plant *Comptonia peregrina* (sweet fern). CL-5 has shown anthelmintic properties in the non-parasitic model nematode, *Caenorhabditis elegans*, and is effective against drug-resistant strains. The Miskowski lab aims to discover the mechanism of action by which CL-5 causes paralysis and death. The DAF-16 transcription factor is a conserved regulator of stress response pathways, and it was shown that DAF-16 is localized to the nucleus in *C. elegans* treated with CL-5. Adult worms exposed to CL-5 die within a few hours, but a fraction of their progeny survive and exhibit developmental delays. A daf-16 mutant strain has a lower survival rate of progeny that come from exposed adults, further implicating the DAF-16 protein in the CL-5

response. Current work seeks to determine if CL-5-treated animals die through apoptotic or necrotic death, which are controlled by different molecular pathways, and progress will be reported.

BP.U.7 Exploring the Copper Resistance Mechanism of the Lipoprotein DcrB in *Salmonella enterica*

Sarah Gonske

Co-author: John May

Mentor: John May, Chemistry & Biochemistry

Salmonella enterica is a major bacterial cause of foodborne illness and invasive disease. *Salmonella* establishes infections by evading host macrophages; these host immune cells engulf the bacteria into a phagosome and use mechanisms to destroy the foreign body. Within the phagosome, bacteria are subjected to many harsh conditions, one possibly being toxic amounts of copper metal ions. We have previously demonstrated that the periplasmic-anchored lipoprotein DcrB (possessed by *S. enterica* serovar *Typhimurium*) conveys resistance to toxic concentrations of copper ions, and thereby may play a role in *Salmonella*'s survival within the host. To gain a better understanding of the protein's function, we have explored gene expression affected by DcrB and possible interactions between the protein and small, cellular metabolites. Using reverse-transcriptase quantitative PCR, we have shown that DcrB plays a role in the upregulation of some cell envelope stress response genes. DcrB, however, does not significantly affect regulation of copper ion transport genes or other copper ion resistance genes. Through thermofluor assays, we have shown that purified DcrB protein has increased stability in toxic copper ion concentrations when extracellular amino acids are present in solution. This result suggests that DcrB has copper-dependent interactions with free amino acids. Overall, these findings advance our understanding of how DcrB confers resistance to copper ions.

BP.U.8 Pool 8 of the Mississippi River: Shady Maple Classification

Sydney Graff

Co-author: Blake Olson

Mentor: Cynthia Berlin, Geography & Earth Science

I have created land cover and land use (LCLU) classifications for Shady Maple within Pool 8 of the Mississippi River. Shady Maple is located on the eastern side of the Mississippi River, near Stoddard, WI. This pool flows from lock and dam 7 near Dresbach, Minnesota to lock and dam 8, located near Genoa, Wisconsin. I have analyzed two color infrared (CIR) photographs that were previously mosaicked together, creating one single photograph. Both of these photographs have a 1-meter spatial resolution and were taken on September 20, 2006. To analyze the images and create land cover and land use classifications, Feature Analyst from ArcMap was utilized. Feature Analyst is used to perform feature extractions from remotely sensed images. The supervised learning feature allowed me to use selected samples from each class and run this process to create a classification for the entire aerial photograph. For my project, the purpose was to create complete classifications of this area using the feature extraction software discussed above. The product is a LCLU map presenting the classification results of Shady Maple within Pool 8.

BP.U.9 Identification of Protein Targets of Antimicrobial Compounds that block *Salmonella* Antibiotic Resistance

Marisa Griesel

Mentor: John May, Chemistry & Biochemistry

Antibiotic resistance of Gram-negative bacteria, a type of microscopic organism, is a rampant issue in the world today. To combat this problem, new antimicrobial compounds are being developed that block the ability of bacteria to turn on resistance to antibiotics. One antimicrobial compound that has been researched in Dr. May's lab, Riluzole, or compound 8, blocked the bacteria from becoming resistant to Polymyxin B. To discover the inner workings of compound 8, genetic changes, or mutations, were induced in the test organism's genetics, which caused the organism to become resistant to compound 8. Initially, a reliable resistant mutant, named JM391, was produced. Several repeatable trials

were then done to show replicable resistance patterns by JM391 to compound 8. Furthermore, using a 24-well plate assay, new antimicrobial compounds similar to compound 8 were also tested. Looking ahead, more trials must be run to confirm antimicrobial resistance in JM391. After resistance is confirmed, the genetic make-up of JM391 will be examined to determine the resistance mechanism. This genetic makeup, known as DNA, is the reason behind all of JM391's characteristics, including its resistance to these antimicrobial compounds. By comparing this DNA to the DNA of a bacterium that is not resistant to the compounds, the mutations conferring resistance in JM391 can be identified. These mutations are expected to occur at one or more of the following sequences of DNA: *phoQ*, *pmrB*, *cpxA*, or *tolC*.

BP.U.10 Evaluation of 4-hour vs 2-hour Gastric Emptying Procedure

Raven Haas

Co-authors: Carlyn Johnson (Marshfield Clinic), Abigail Grancorvitz (Marshfield Clinic), and John Dahlin (Marshfield Clinic)

Mentors: Aileen Staffaroni, Health Professions; Carlyn Johnson, Marshfield Clinic

A commonly performed Nuclear Medicine scan is a gastric emptying (GE) procedure for the determination of normal stomach function. This is a non-invasive diagnostic procedure that examines the stomach's emptying function. Clinical indications for a GE procedure include rapid dumping of the stomach contents or delayed gastric emptying, which can include symptoms such as pain, nausea or loss of appetite. The patient eats scrambled eggs that were cooked with a small amount of a radiopharmaceutical (99mTc-Sulfur Colloid), which acts as a "tracer" due to the gamma photons that are emitted from the radioactivity. The patient is then imaged with a gamma camera, which creates an image of the stomach and can determine the speed of food emptying. Images are taken at different time intervals and emptying percentages are rendered for clinical diagnosis. Marshfield Medical Center performs a 2-hour imaging protocol as compared to the 4-hour imaging protocol recommended by the Society of Nuclear Medicine and Molecular Imaging. Due to the variation in protocols, the purpose of this study was to compare the 2-hour and 4-hour imaging protocols in a normal patient population to determine if the results have the same diagnostic conclusion. All methods, results, and conclusions will be shared during this poster presentation.

BP.U.11 Establishing Viking Social Status through the Analysis of Metal Objects across Different Sites

Jillian Jensen

Mentors: Heather Walder, Archaeology & Anthropology; Constance Arzigian, Archaeology & Anthropology

From roughly 793 A.D. to 1066 A.D., Vikings spread across of northern Europe, expanding their power across different regions through raiding and trading. As a result of their economic growth, social stratification arose in the Viking culture. It is important to study the Viking Age in order to understand why they migrated to specific regions and how the migration affected their social systems. In this study, I compared the prestige value of metal artifacts from three areas: Finland, Iceland, and England, to investigate differences in Viking social status among the individual sites and then on a regional scale. From these three areas four sites were closely analyzed. Finland and England both consists of burials, while two sites in Iceland consist of villages. Observation and further analysis between these sites represent how Vikings embraced social status in new settings as they migrated around the world. On the regional level I compared the sites in general based on the presence and absence of certain categories such as status among burials. This analysis offers a general comparison of metal objects across Viking age sites and explores artifacts that represent social status differences between Viking sites on the mainland and those further away.

BP.U.12 Effects of Varying Force and Cross-Sectional Area on Achilles Tendon Stress

Kadin John and Calvin Wernimont

Mentor: Thomas Kernozek, Health Professions

Achilles tendon (AT) stress has been investigated in running to gain a better understanding of injury. Several parameters are used in finding AT stress. These include AT force and AT cross-sectional area. In the present study, we calculated AT stress by varying the AT cross-sectional area and AT force by 5% (positive and negative). Fourteen females ran while thirteen digital cameras (180 Hz) recorded their motion, and a force plate platform (1800 Hz) measured the ground reaction force data. These kinematic and kinetic data were used in a musculoskeletal model to determine the AT force. AT cross-sectional area was measured by ultrasound. AT stress was calculated by AT force divided by AT cross-

sectional area. An increase in AT force or a decrease in AT cross-sectional area resulted in an increase in AT stress; when AT force was decreased or the AT cross-sectional area was increased, then AT stress was decreased. In conclusion, the increase or decrease of AT force or cross-sectional area is proportional to the change in AT stress; the change in AT stress was approximately 5% to 10%.

BP.U.13 Characterization of HPIV3 Variants Expressing Tagged M Proteins

Jordan Kucksdorf

Mentor: Michael Hoffman, Microbiology

Human parainfluenza virus serotype 3 (HPIV3) is an enveloped, non-segmented, negative-sense RNA virus. This virus is most noted for causing lower respiratory diseases such as pneumonia and bronchiolitis in young children. However, there are currently no approved vaccines or antivirals available against the virus. The HPIV3 genome encodes six structural proteins, one being the M protein. The M-protein plays an essential role in viral budding and assembly, which are critical processes in the viral life cycle. The M-protein presents a potential target for antivirals because during assembly this protein is able to connect the viral envelope proteins and the ribonucleoprotein core, making the M-protein a central organizer for assembly and release. In previous work, the M-protein was tagged with Flag tags at the amino or carboxy termini. These altered M-proteins were able to efficiently release from cells like the wild type (WT) M protein and successfully make virus-like particles. However, when tagged M-proteins were engineered into the virus, viruses containing these tagged proteins appeared to replicate poorly. Through a series of standard growth curves, when comparing the possible areas on the M-protein, it was found that when compared to the WT, they all had reduced particle release.

BP.U.14 Comparison of Quantitative and Qualitative DaTscan Results

Merissa Larson

Co-authors: Carlyn Johnson (Marshfield Clinic) and Stacey Schmitz (Marshfield Clinic)

Mentors: Aileen Staffaroni, Health Professions; Carlyn Johnson, Marshfield Clinic

DaTscan (Dopamine Transporter Scan) is a non-invasive Nuclear Medicine brain scan used to differentiate Parkinson's disease, a slowly progressive neurodegenerative brain disorder, from Parkinsonism, caused by neurological disorders. Ioflupane (I-123), a radioactive tracer injected into the patient's bloodstream, binds to the presynaptic DaT protein in the patient's brain. Images of the patient's brain are obtained using a gamma camera in order to provide visualization of the dopamine transporter levels in the brain. A normal DaTscan would appear as symmetrical comma shapes, while an abnormal DaTscan would show an asymmetrical period shape. Marshfield Medical Center Nuclear Medicine department has visually read DaTscans in the past; however, the recent implementation of DaTscan specific software now allows for quantitative evaluation also. The software automatically draws regions around several areas in the brain. The purpose of this study is to determine if the quantitative software results aid in providing more reliable diagnostic results than qualitative evaluation alone.

BP.U.15 Hmong Access to Mental Health Facilities in the Wisconsin: Variation in Time and Space

Paul Lee

Mentor: John Kelly, Geography & Earth Science

Members of Hmong American communities tend to avoid the topic of mental and emotional health, likely in part to avoid re-experiencing the trauma of forced relocations. As any immigrant community and its native-born-US cultural milieu adjust to each other, mental health access might be expected to improve. The cases where it does not may offer insight into unexpected challenges to mental health access, including factors of local and regional geography. I have documented and mapped Hmong access to mental health facilities in the counties of La Crosse, Marathon, Sheboygan, and Milwaukee, Wisconsin. Quantitative and qualitative methods were employed. Census data was used to identify the historic arrival of Hmong people. Key informants at mental health facilities, and in Hmong community groups, were surveyed through questionnaires, followed by semi-structured interviews (in person and through videoconferencing). Questions explored the approximate rate of use, geographic reach among each Hmong community, and the existence and effectiveness of Hmong-friendly practices (e.g., translators and signs). Depending on the themes that emerge

through more in-depth interviews and questionnaires, these variables may include geographic indicators such as rural vs. urban, socioeconomic levels, and the cultural or ethnic makeup of the overall population.

BP.U.16 Role of the Carboxyl Terminus of the Matrix Protein

Kristyn Loyva
Co-author: Alix Raymond
Mentor: Michael Hoffman, Microbiology

Human parainfluenza virus type 3 (HPIV3) causes upper respiratory tract infections that mainly affect children and the elderly. Research in the Hoffman lab focuses specifically on the matrix (M) protein of HPIV3 which plays an important role in the formation of virus particles and their release of virus from cells. To coordinate assembly and release of virus particles, the M protein also interacts with other viral proteins and cellular components. The carboxyl terminus of the M protein may be responsible for some of these interactions. Four C-terminal mutants were created, missing the last 2, 5, 15, or 25 amino acids of the M protein sequence. In a virus-like particle release assay of M protein function, it was found that the $\Delta 15$ and $\Delta 25$ mutants had significantly decreased release ability in comparison to the $\Delta 2$ and $\Delta 5$ mutants and the wild type M protein control. These results suggest that the carboxyl terminus plays an important role in M protein interactions important for virus particle release.

BP.U.17 Determining Significant Mutational Patterns in the H3N2 Influenza Virus

Juliette Moushon
Mentor: Peter Wilker, Microbiology

Over an estimated 49,000,000 Americans were impacted by influenza in the 2017-2018 flu season. The influenza virus has a nearly 14,000 base pair long sequence and a highly error prone RNA polymerase that allows for a mutation rate faster than scientists can keep up with. My research studies how repeated reductions in viral population size affect the mutational patterns of an influenza H3N2 virus. Viral population size is substantially reduced during person-to-person transmission. We model these transmission events by serially growing influenza viruses in the lab for 30 rounds. At each round of growth, a small, pre-determined number of viruses is used to initiate the next infection, and the genetic diversity within the overall population of viruses decreases. This reduction in genetic diversity is called a genetic bottleneck. Our overall goals are to measure how genetic bottleneck sizes affect virus mutational patterns during serial growth in the lab.

BP.U.18 Viewing Verbal Violence: University Students' Perceptions of "Soap Dropping" Threats

Kaylee Mulholland
Mentor: Uttara Manohar, Communication Studies

As a means of ideological (re)production, television engages with scripts that reinforce and reflect social values that guide human thought and behavior. The prison drama genre has particular influence educating audiences who lack experience with the carceral system on the "realities" of prison. This study used an online survey to examine university students' interpretations of verbal threats in the prison dramas *Orange is the New Black* and *Prison Break*. Participants were randomly assigned to watch one of four scenes that included a sexual or non-sexual verbal threat and assessed five variables: threat severity, likelihood of threat actuation, realism of the scene, adherence to gender identity, and motive of the threatener. The study used multivariate regression analysis to examine the relationship between television show and threat type as moderated by female, male, and prison rape myths. The findings of this study have implications for how prison violence, both sexual and non-sexual, is addressed within and outside mediated contexts. The results of this study recognize the impact representations have on minimizing the severity of violence.

BP.U.19 Proliferation Assays of Megakaryocytes

Grace Muntifering and Kaleb Myhrwold
Co-author: Jaelyn Wisinski
Mentor: Jaelyn Wisinski, Biology

Proliferation of cells occurs when cells are in desired conditions to grow and divide. Megakaryocytes are capable of proliferating and producing platelets. Some viral infections and some cancer treatments can cause an individual's megakaryocytes to stop proliferating normally. With fewer megakaryocytes, less platelets could be produced leaving an individual at risk for severe bleeding complications. In megakaryocytes, the signaling protein Rap1b contributes to two seemingly different jobs of cell division and cell adhesion. The cellular location of Rap1b is dictated by modification (phosphorylation) by the proteins PKA. We hypothesize that the localization of Rap1b, which is dictated by phosphorylation, influences megakaryocyte proliferation. To test this hypothesis, we are doing assays that determine if cells are alive and functional on consecutive days (up to 4) following the activation or inhibition of PKA. Results from these experiments could help identify therapeutic targets to correct low platelet counts and prevent risk of bleeding.

BP.U.20 Immigration and Ideology: An Analysis of Newton and Huxley Cemeteries

Laura Paisley
Mentors: Connie Arzigian, Archaeology & Anthropology; James Theler, Archaeology & Anthropology

The history of Wisconsin is one that has experienced immense change over time. Throughout the nineteenth and twentieth centuries, the ethnic makeup and culture of the state can be seen through in-depth study of the material culture. Specifically, the history of Vernon County in Wisconsin is a prime example of where the ethnicity and culture changed as time progressed. Newton, Wisconsin, located in Vernon County and in Harmony Township, was first settled in 1850 and officially organized into a town in 1856. Major migrant groups were from the eastern United States, Germany, and Norway. The culture of Vernon County was influenced by the various ethnic groups who settled there, but also national trends. The gravestones located in Newton and Huxley Cemeteries can be used as material culture to illustrate not only the changes within that community throughout the history, but also what part of the surrounding population was using these two cemeteries. The manner in which the people of Harmony Township used Newton and Huxley Cemeteries is not discussed in written record but through using iconography on the gravestones and census records of the individuals found, that question will be answered.

BP.U.21 The Change in Iconography on Tombstones in Ireland through the 16th to 19th Century and How It Correlates with Societal and Cultural Changes

Bailey Parker
Mentors: Constance Arzigian, Archaeology & Anthropology; Timothy Andrews, Archaeology & Anthropology

Tombstones, also known as gravestones, headstones, and grave markers, can be viewed as a durable record of a person's life. Besides containing the deceased's name and years of life, tombstones also include sculptured designs, artworks, and iconography that can denote religious beliefs, social class, occupation, and other aspects of the person's life. My project analyzed the iconography of tombstones in cemeteries, abbeys, and graveyards in Ireland. The purpose is to connect the change in iconography on tombstones with cultural, historical, and societal changes throughout Ireland's history specifically in the 16th to 19th century. Most of the tombstones date to the 16th to 19th century because due to deterioration not many older tombstones survive. I expect to draw numerous connections between the iconography on the tombstones and the cultural and societal roles of the people, as well as connections between the iconography and the historical, cultural, and societal changes through Ireland's history. By being able to draw connections to certain types of iconography only being used at a certain time, we could better understand the cultural context and time frame of other tombstones with similar iconography.

BP.U.22 Development of a Regulatory T Cell Biomarker for Food Allergen Tolerance during Oral Immunotherapy

Brianna Pearson, Matigan O'Leary, and Jennifer Klein
Mentor: Jennifer Klein, Biology

Our goal is to characterize a novel genetic biomarker for the development of immune tolerance to food allergens during sublingual immunotherapy. We are focusing on regulatory T cells (Treg cells) which are a specialized group of T cells that act to suppress the immune system. They prevent autoimmune disease and allergy. Treg cells are regulated by a master gene called FoxP3, which is a transcription factor that controls the expression of many other genes, which are required for healthy Treg cells. Patients who have allergies have low FoxP3 expression. Our hypothesis is that the FoxP3 gene is methylated, which turns the gene off. Oral immunotherapy for allergic patients could demethylate the FoxP3 gene and turn it back on. We will test this hypothesis using 100 patients undergoing oral immunotherapy at Allergy Associates.

BP.U.23 Interventions Affecting Climate Change Attitudes & Behaviors

Sophie Pitney and Mari Youngquist
Mentor: Katherine Kortenkamp, Psychology

This study explores the impact of environmental education and engagement with the natural environment on adult attitudes, beliefs, and behaviors toward climate change. We collected data on the effectiveness of two interventions relative to a control group: outdoor engagement (a 30-minute guided forest hike) and environmental education (a recorded lecture). To evaluate participants' attitudes and behaviors throughout the study we used a survey designed to measure environmental attitudes, climate change beliefs, and frequency of eco-friendly behaviors. We will conduct a two-way mixed ANOVA in order to find differences between experimental and control groups, as well as changes in attitudes and behavior from before and after each intervention. If our results are what we expect, we would conclude that a combination of environmental engagement and environmental education fosters greater understanding of the impacts of climate change and how lifestyle choices might help mitigate individual contribution. This conclusion would inform larger scale interventions for adults that could increase climate change acceptance and awareness and encourage eco-friendly behavior change, including but not limited to: consumerist behaviors, recycling, and voting for representatives who prioritize environmental health.

BP.U.24 Determining the Role of AXL in CHK1 Inhibitor Resistance in Breast Cancer Stem-like Cells

Marc Rademaker and Carter West
Mentor: Sierra Colavito, Biology

Breast cancer can be subdivided into several different sub-types depending on the properties of the tumor. The claudin-low (CL) sub-type of breast cancer is particularly aggressive and highly metastatic. There are no targeted therapies for patients with CL breast cancer. Recently the laboratory has determined that CL breast cancers are sensitive to inhibition of CHK1. CHK1 is a protein that activates cell cycle checkpoints in response to DNA damage. The problem is that in the clinical setting, patients often develop resistance to targeted therapies. Therefore, the laboratory established CL breast cancer cell lines that are now highly resistant to CHK1 inhibitors. In exploring the mechanism of resistance, high activation of the AXL signaling pathway was observed. We are investigating whether co-inhibition of AXL and CHK1 can restore sensitivity to these resistant CL breast cancer cells, in terms of colony-forming ability. Our preliminary evidence suggests that the co-treatment is more effective in limiting the independent growth of these highly resistant cancer cells.

BP.U.25 Characterizing a Protein that Regulates Epstein-Barr Virus Replication: Potential Antiviral Target

Alex Robbins
Mentor: Kelly Gorres, Chemistry & Biochemistry

The Epstein Barr-Virus (EBV) is primarily known for causing infectious mononucleosis, but also increases the incidence of white blood cell cancers and autoimmune disorders. There is currently no vaccine or effective treatment

once infected by EBV. EBV infects white blood cells and makes proteins that induce viral replication from its genome. The protein dUTPase is made by the virus during the replication process and regulates the availability of one of the building blocks of DNA that is necessary for the virus to replicate. Without that building block the structure of newly synthesized DNA is compromised and the virus cannot replicate. This has been shown in a Murine virus closely related to EBV.

BP.U.26 Teacher Candidates and Their Confidence in Discussing Poverty

Ellie Rohman

Mentor: J. Scott Baker, Educational Studies

This article examines teacher candidates (TCs) at an upper Midwest university and their confidence in discussing poverty. TCs took a survey explaining their confidence or lack of confidence in discussing poverty; their perspective is important to obtain because their understanding of poverty impacts the students they will teach. TCs' perspectives about poverty and the many details and complexities of understanding poverty is crucial for education programs to be aware of what to possibly change their programs and for TCs to do more independent research. Using visual inquiry to show the categories on the TCs' responses creates an easy way to view the data and to feel the emotions connected to the answers. Many of the TCs answered that they were not or somewhat confident because of the lack of confidence, research, education, or experiences with poverty.

BP.U.27 Conservative or Not? Evaluation of the Sediment Binding Characteristics of the Conservative Dye, Rhodamine WT

Veronica Sannes

Co-author: Eric Strauss

Mentor: Eric Strauss, Biology

Rhodamine WT (RWT) is a fluorescent dye used to trace direction and flow of water in natural aquatic systems including rivers and streams. The dye is very useful because it can be detected at very low concentrations (< 1 ppb) and is considered to behave conservatively, i.e., it is not taken up by organisms or adsorbed to substrates, after release in an aquatic system. However, in the scientific community there is speculation that RWT might bind to certain sediments in the water. To investigate this concern, the following research question was made: Does RWT bind to stream sediments? If so, the following question was also made: How does RWT bind differently to different sediment types? To examine these questions, we conducted a laboratory experiment where sediments from 20 streams were dosed with ca. 100 ppb RWT and incubated for 24 h on an orbital shaker. A fluorometer was used to measure the amount of RWT in the samples during the incubation period. We found RWT concentrations decreased significantly in all stream sediments during the incubation. Patterns with RWT reduction and sediment characteristics were also assessed. These results indicate that under certain experimental conditions, RWT may not function conservatively in stream ecosystems following release and additional studies are warranted to determine under what conditions RWT should be used as a conservative tracer of water movements in aquatic ecosystems.

BP.U.28 Site-specific Mutagenesis Analysis to Elucidate the Phosphorylation Site of the BrpS Protein Involved in *Staphylococcus aureus* Biofilm Production

Lillian Shulte

Mentor: William Schwan, Microbiology

Staphylococcus aureus causes thousands of biofilm-associated infections in the United States each year. A complete understanding of what regulates biofilm formation in *S. aureus* is important for continued progress on prevention and treatment of biofilm-related infections. We have identified a putative two-component system named BrpR (response regulator) /BrpS (sensor kinase) that may be involved in regulating biofilm formation in *S. aureus*. Sensor kinase proteins sense the environment and become phosphorylated on a histidine, serine, or threonine amino acid within the cytoplasm of the bacterial cell. The BrpS protein is thought to be the sensor kinase for the two-component system. Previously, a mutation of the brpS gene was shown to increase biofilm formation in *S. aureus* compared to the unmutated parent strain. A site-directed mutagenesis of the brpS gene was done to ascertain the specific amino acid on the BrpS protein that is phosphorylated and involved in regulating biofilm formation. Through triplicate biofilm assays,

it was ascertained that an amino acid substitution of threonine to alanine at the 78th position and substitutions of threonine to asparagine at the 86th position resulted in the same level or lower level of biofilm formation when compared to the unmutated parent strain. This indicates that neither mutation was the phosphorylation site for the BrpS protein.

BP.U.29 Kept Prisoner by Substance Abuse: A Cross-Examination between College Students and Juvenile Delinquents

Haylee Stachow

Mentor: Ryan McKelley, Psychology

This research is a cross-examination between the substance abuse patterns of juvenile delinquents and UWL college students. A large stigma is put behind the reasons people choose to abuse substances. Often, no one decides to dig deeper into the potential emotional reasoning behind these actions. In this research, we continue to support the multiple studies that stated that substance use can be attributed to peer pressure, exposure to violence, and parental hostility. The purpose of this study is to compare the likelihood of new college students to newly released prisoners participating in substance use. These subjects were chosen due to their age and new independence. College students are experiencing living independently for the first time, whereas newly released prisoners are now trying to restart their lives and reinstate themselves in society. The focus is going to be on the presence of substances and how much of an impact your past can play in the role of substance use. College student participants will be given a survey on a series of categories that are asked to give an idea of any adverse childhood issues that may affect them today.

BP.U.30 Sticking with It: Adherence to a Home-based Exercise Program

Mathew Waller

Mentor: Alexander O'Brien, Psychology

This study investigated aspects of home-exercise programs assigned by a medical professional to see if they influenced patient adherence and compliance. By finding controllable aspects of these programs which affect adherence, medical professionals will have knowledge of how to build programs which maximize the likelihood patients will comply.

BP.U.31 Macaroni & Cheese as an Alternative Meal for Gastric Emptying Procedures

Jordyn Wichlacz

Co-authors: Carlyn Johnson (Marshfield Clinic), John Dahlin (Marshfield Clinic)

Mentor: Aileen Staffaroni, Health Professions; Carlyn Johnson, Marshfield Clinic

A gastric emptying procedure is a common test performed in nuclear medicine to assess a patient's stomach function. Typically, a patient eats a meal consisting of scrambled eggs containing radioactivity (^{99m}Tc sulfur colloid), two slices of buttered toast, and 300 mL of water followed by imaging at various time intervals post-ingestion. The radioactive eggs emit photons that are detected by a gamma camera to create images which enable us to determine how fast food empties from the patient's stomach. Since some patients cannot eat eggs due to allergies, intolerance, or personal preference, many nuclear medicine departments use oatmeal as a substitute to eggs for gastric emptying studies. Literature has suggested that oatmeal may not truly represent a solid-based meal; therefore, we investigated the use of macaroni & cheese as an alternative meal. The purpose of this study is to determine if a macaroni & cheese meal will provide gastric emptying rates comparable to those from the current Marshfield Medical Center Nuclear Medicine Department standardized egg-based meal.

BP.U.41 Cognitive Assessment and Social Connectedness: Order Effects on Cognitive Performance

Bailee Golisch and Ellen Rozek

Psychology

Previous research suggests that loneliness, or perceived lack of social support, can have a negative influence on cognitive function (O'Luanigh, et al., 2012; Shankar, et al., 2013). The purpose of this research study is to investigate

the role of order effects on cognitive outcomes when undergraduates complete loneliness and depression scales. Researchers administer a set of WAIS-IV (Weschler Adult Intelligence Scales) subtests (i.e. perceptual reasoning, working memory, and processing speed) as well as assessments for loneliness, social isolation, and depression. In the first condition, participants completed measures of loneliness (e.g. UCLA Loneliness Scale) depression (e.g. Beck Depression Scale), and social isolation (e.g. Lubben Social Network Scale), followed by the WAIS subtests. In the second condition, participants completed the WAIS subtests followed by the social experience measures. Thus far of the 43 participants, 36.6% indicated that they were lonely while 85.4% indicated that they were lonely at times. Results from this study will indicate whether or not exposure to the social experience assessments effects cognitive outcomes, and a better understanding of the relationship between cognition and loneliness. It will also provide further baseline information about loneliness among college students.

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

CP.U.1 Psychophysiological Effects of Video Games and Mindfulness Meditation on Stress Reduction

Lucas Andersen, Bailey Ronnestrand, and Zachary Petrie
Mentor: Michael Wong, Psychology

High levels of stress are reported by undergraduate students globally, but how do we combat student stress? Mindfulness meditation is commonly used to reduce stress. In our first study, we found that a simple, instruction-free video game was just as effective as mindfulness meditation in reducing undergraduate student stress, both psychologically and physiologically (heart rate and blood pressure). In the present study, we extend our investigation to also examine the impact of these interventions on the brain. Following our previous study, we measured both psychological and physiological stress. To measure psychological stress, we asked participants to indicate their perceived stress on a linear scale; and to measure physiological stress, we took electronic measurements of their blood pressure and heart rate. To assess the effect stress has on the brain, we are using electroencephalography (EEG) to examine the relative left versus right frontal lobe alpha-wave asymmetry. Greater left than right alpha-wave asymmetry is indicative of a more relaxed state of mind. All three measurements are taken before and after the participants engage in one of the three 20-minute interventions: guided meditation, playing Flower, or listening to an audiobook (control group). Based on the previous study it is predicted that video games and meditation will both significantly lower psychological, physiological, and neurological stress, with meditation having a more significant reduction.

CP.U.2 Piecing Together the Past: Minimal Analytical Nodule Analysis and the Oneota Culture of the Driftless Region.

Nathaniel Baier
Mentor: Constance Arzigian, Archaeology & Anthropology

Thousands of small, sharp rocks litter the fields. Pits align the area; inside, piles upon piles of rocks. But are these flakes useless? There is much that can be learned through the study of lithic assemblages through various methods in archaeology. One of the lesser known of these methods is Minimal Analytical Nodule Analysis or MANA. MANA is a method that is used to organize lithics into like groups to help show how flakes are related by looking at relational data such as shared color, material, and other traceable elements. This will utilize MANA to answer questions pertaining to lithic flakes from Feature 307 of the Tremaine Archaeological site in the La Crosse county of the Oneota culture. This study is addressing questions of how many lithic cores were utilized, and whether the flakes deposited in a singular dump or during several episodes. By utilizing this analytical method, and answering these questions, this study can give evidence regarding Oneota lithic production, and disposal.

CP.U.3 Investigating the Effect of Circadian Rhythm Disruption on USP8 Expression

Anna Bower
Co-author: Alder Yu
Mentor: Alder Yu, Biology

For the aging population of Americans, the possibility of developing a neurodegenerative disease is often of large concern; included in those is Lewy Body Dementia (LBD). LBD is caused by the accumulation of alpha-synuclein, a protein that is regulated by the deubiquitinating protein USP8. USP8 has shown to have cyclical expression and be regulated by the circadian rhythm. We hypothesize that by disrupting the circadian rhythm, the expression of USP8 will differ significantly from the gene expression of USP8 on a normal circadian rhythm. This was carried out on *Drosophila melanogaster* (fruit flies) as a model organism, who have similar biological mechanisms for the regulation of the circadian rhythm to humans and also carry the gene USP8. One cohort of flies was raised on a typical 12:12 light dark circadian rhythm schedule, and another was raised on an atypical 8:8:8 light dark circadian rhythm schedule. USP8 expression will be measured with qRT-PCR; a higher expression under an irregular circadian rhythm will indicate a higher amount of alpha-synuclein accumulation, and a lower expression will indicate a lower amount of alpha-synuclein. This research seeks to determine if living with an irregular sleep schedule that disrupts the circadian rhythm can increase one's risk of developing Lewy Body Dementia.

CP.U.5 Perceptions and use of Food Assistance Programs in La Crosse, WI

Kennedy Brault

Mentors: Christine Hippert, Archaeology & Anthropology; Vincent Her, Archaeology & Anthropology

What does it mean to go without food? Is food insecurity an issue of personal, or societal origin? This study explores food assistance programs (FAP) in La Crosse, WI to better understand the lives of those who depend it, as well as those who have worked feverishly to ensure that such food security programs are in place. Through participant observation at the Kane Street Community Garden, volunteer work with the Hunger Task Force, and interviews and surveys, I will learn about the lives and experiences of the peoples involved. Through their personal stories, it may be possible to contemplate, in greater depth, more complex issues such as the link between structural inequality and people's ability to put food on the table. Can experiences of food insecurity be explained holistically without blaming, or stigmatizing those whose needs are regularly met by food assistance programs? My goal is to construct an experiential informed understanding of this highly sensitive, if not also controversial, social issue as a crucial dimension of the human experience.

CP.U.6 Churches across the Empire: An Economic Comparison of Churches in the Byzantine Empire

Jason Brunner

Mentor: Amy Nicodemus, Archaeology & Anthropology; Mark Chavalas, History

In this study I attempt to reconstruct the economic relationships between the different regions of the Byzantine Empire during the 6th Century AD. In order to do this, I will be comparing churches from different parts of the Empire, both ones excavated through archeology and ones still standing, using a set of criteria to ascertain their wealth in order to see the dispersion of wealth across the empire.

CP.U.7 Characterize the Impact of Oxidative Stress on Stem Cell Proliferation and Differentiation

Anna Buss and Jennifer Klein

Mentor: Jennifer Klein, Biology

Oxidative stress that occurs with aging causes stem cell dysregulation. We intend to determine the molecular targets of oxidative stress, specifically, how much the protein methionine is oxidized. We will measure this by mimicking oxidative stress using hydrogen peroxide and then observing the treated cells with immunofluorescence. Additionally, we will determine the extent of stem cell proliferation when impacted by oxidative stress. To achieve this, we will vary the amounts of hydrogen peroxide the cells are exposed to and measure their growth. Finally, we will determine how oxidative stress affects cell cycle inhibitor genes by measuring gene expression. We will do this with quantitative PCR, which measures how many copies of DNA there are of each gene we are studying. This work is important because, as we age, muscle cells undergo increased oxidative stress, which damages their ability to regulate growth and repair. Determining the targets of oxidative stress will facilitate the development of new treatments.

CP.U.8 $^{19}\text{F}(\text{d},\text{p})^{20}\text{F}$ Measurements using the Super-Enge Split-Pole Spectrograph with Implications to Type-I X-ray Bursts

Alex Conley and Raffy Trass

Co-authors: Shelly Leshner, Gordon McCann, Ken Hanselman, Lagy Baby, Paul Cottle, Chris Esparza, Kirby Kemper, Anthony Kuchera, Gray Selby, Jessica Nebel-Crosson, Lew Riley, and Ingo Wiedenhoever
Mentor: Shelly Leshner, Physics

Accreting neutron binary systems generate frequent x-ray bursts upon breaking out from the hot Carbon-Nitrogen-Oxygen (CNO) cycle to the rapid proton-capture process (rp) by the $^{15}\text{O}(\alpha,\gamma)^{19}\text{Ne}(\text{p},\gamma)^{20}\text{Na}$ reaction chain. Previous studies investigated the $^{19}\text{Ne}(\text{p},\gamma)^{20}\text{Na}$ reaction rate by using the $^{19}\text{Ne}(\text{d},\text{n})^{20}\text{Na}$ mirror reaction, relying on experimental data from the isospin-mirror reaction $^{19}\text{F}(\text{d},\text{p})^{20}\text{F}$ and shell model calculations to determine which states will populate with significant cross sections. We investigate the $^{19}\text{F}(\text{d},\text{p})^{20}\text{F}$ reaction as an indirect study of the $^{19}\text{Ne}(\text{d},\text{n})^{20}\text{Na}$ to obtain reliable data and lessen existing uncertainty of the thermal reaction rate. The experiment was

performed using the Super-Enge Split-Pole Spectrograph at FSU's John D. Fox Accelerator Laboratory to measure high-resolution spectra of high-lying states in ^{20}F . Absolute cross sections and spectroscopic factors are determined for proton resonances in ^{20}F at 0.66, 2.04, 2.19, 2.97, 3.49, and 3.53 MeV energies which contribute to the level structure of ^{20}F .

CP.U.9 Investigating Presence of Perineuronal Nets Surrounding Parvalbumin Expressing Neurons Seasonally in the Hibernating Ground Squirrel

Jacky Dickman and Alexandria Graeber
Mentor: Christine Schwartz, Biology

The ground squirrel experiences extreme changes in physiology during hibernation associated with changes in neurons. Preliminary data showed that perineuronal nets (PNN) surround neurons in the cerebral cortex and hypothalamus as well as other areas in torpor, interbout arousals (IBA), and summer. PNN coverage is increased in the hypothalamus during hibernation, but seasonal differences were not found elsewhere. Previous work in other species indicates that perineuronal nets (PNNs) restrict plasticity of neurons and are found around parvalbumin (PV) expressing neurons. PNNs in the ground squirrel brain could be important for maintaining important connections and/or protecting neurons from damage, but their role is unclear. Here, we help characterize the identity of the neurons surrounded by PNNs by investigating expression of PV in the ground squirrel brain using fluorescent immunohistochemistry and investigating where PNNs and PV colocalize. Preliminary results indicate that PNNs surround PV expressing neurons in the cerebral cortex of torpor, IBA, and summer ground squirrel brains while PV expressing neurons are not present in the hypothalamus. This suggests that the PNNs in the cerebral cortex are similar to other species, while the PNNs in the hypothalamus might be different and important for the hibernation phenotype.

CP.U.10 Inactivation of *Shigella sonnei* by a Novel Water Disinfection System Using Plastic Beads Coated with Agricultural Byproducts

Emma Freeman
Mentor: Xinhui Li, Microbiology

Diseases caused by waterborne pathogens are a major public health concern around the world. Pathogens that commonly cause these waterborne diseases include viruses, parasites, and bacteria. *Shigella*, a bacterial pathogen, is one of the top three causes of drinking water outbreaks and *Shigella sonnei* is the most common species in the U.S. One current strategy to control pathogens in water is the use of chlorine. However, since chlorine is left in the water after treatment, it could pose a potential health hazard, which limits the concentration of chlorine that can be used. Recently, a new water treatment system was developed by immobilizing chlorine on plastic beads coated with agricultural byproducts: yeast and chitosan. The new treatment system has the advantages of having a high concentration of chlorine attached on the beads for microbial inactivation and low released free chlorine in the water after treatment. The goal of this study is to evaluate the antimicrobial efficacy of these chlorinated beads for inactivation of *S. sonnei*. The specific objectives are to examine the impact of flow rate on the antimicrobial efficacy of chlorinated beads for inactivation of *S. sonnei* and evaluate the capacity of the chlorinated beads for inactivation of *S. sonnei* in water. The results from this study will be used for applying additional funding for scaling up and continuing research of this water treatment system.

CP.U.11 Mapping Past Mountaineering Fatalities in the Himalayas

Sydney Graff
Mentor: Gargi Chaudhuri, Geography & Earth Science

Many mountaineers have passed away during the pursuit to trek through the Himalayas due to frostbite, avalanches, physiological causes, and extreme altitude. They're frozen at the location where their journeys ended, and their bodies are preserved by layers of ice and snow around some of the world's highest peaks. Due to increase in annual average temperature, the ice and glaciers around these peaks have been melting at a faster rate than the yearly snow accumulation, resulting in the resurfacing of bodies of past climbers. A detailed record of the mountaineering expeditions have been archived by Elizabeth Hawley in her pioneering work titled 'The Himalayan Database'. This database recorded every expedition's details at each peak in the Himalayan Range during all seasons from 1950 to 2014 and is available in tabular format on a CD. The present research aims to convert the Himalayan database from tabular

format into a web map. The variables used for visualization will include trekking routes, expedition directions, and deadliest peaks within a selected area of the range. The expected outcome is a visually attractive, highly interactive, and user-friendly web map which will display the variables discussed above to showcase the journeys of mountaineers in the Himalayas.

CP.U.12 The LGBTQ+ Experience and Perception of Social Issues in La Crosse, WI

Julie Gulling

Co-author: Cali Ogurek

Mentor: Elizabeth Peacock, Archaeology & Anthropology

This project explores what it means to be LGBTQ+ through the personalized voices of individuals living in La Crosse, WI. In particular, how do LGBTQ+ individuals negotiate their identities in a society still dominated by heterosexual norms and expectations? Moreover, what kinds of discrimination is the LGBTQ+ community continuing to experience in their daily lives and what is the impact of these discrimination on their own assessment of their mental well-being? Informed by these concerns, the researcher will conduct interviews, administer surveys and do participant observation in two locations to learn how people are going about, in very deliberate ways, to manage their identities as unique individuals. The goal of this research is to provide an emic view of the complex lives of LGBTQ+ people as anything but monolithic.

CP.U.13 Study of Migration on Education: Global Comparison between Japan and the U.S.

Kambrie Haas, Ally Gesteland, Emma Hedding, Lindsey Strzyewski, Veronica Eilers, Colm Alba, Abby Stellmacher and Allison Gesteland

Mentor: Heather Linville, Educational Studies

“Globalization creates new cognitive and skill demands on people, and therefore new educational opportunities for schools and teachers.” -Fernando Reimers. Human migration has tremendously increased, and education systems must respond to the impact of migration. Our research will compare the impact and responses to human migration in education systems present in the United States and Japan. Japan is known to be an insular society and has one of the lowest immigrant populations, less than two percent, while the U.S., the “nation of immigrants,” is currently at 14 percent. While there are differences in educational issues relating to migration, each nation attempts to create cohesion across cultural and ethnic differences as each society has one dominant ethnic group. Using qualitative research with discourse analysis of interviews with students, educators and others, along with field observations, we will find disparities and commonalities between the educational systems of the two countries. The outcome will be a broader understanding of the multifaceted issue of human migration; specifically, its effect on education systems worldwide, giving us a broader perspective on education and migration worldwide. The results of the data collected will be shared among current and future educators to address the impact that migration has on education systems, eventually leading to proposed solutions that educators can then use to address and alleviate the problems within the US system.

CP.U.14 Increasing the Stability of β -keto Functional Groups Inverts the Regioselectivity of β -Ketoacetanilides

Taylor Hackel

Mentor: Heather Schenck, Chemistry & Biochemistry

The frustrated Lewis pair tris(pentafluorophenyl)borane with alkyl-substituted silanes has demonstrated efficient, selective, and controlled reduction of a diverse range of functional groups. Its role as a reductant complements the selectivity of hydride reductants while offering greater flexibility due to its compatibility with water. The FLP has been shown to exclusively reduce the amide bond of acetanilides possessing carbonyl moieties appended to the para position, whereas the addition of sodium borohydride would exhibit the opposite selectivity. Further, the regioselectivity is reverted when a ketone is positioned β to the amide, generating a silyl ether. The reaction has been hypothesized to progress through a chelating intermediate which activates the previously ignored ketone for reduction. A kinetic study utilizing ^1H NMR spectroscopy was designed to determine if a relationship existed between the degree of electron donation of aromatic substituents and the rate of reduction of the β ketone. A positive correlation would indicate that enhanced nucleophilicity of the amide carbonyl accelerates the attack of the FLP to generate the immediate silyloxonium localized to the amide prior to its stabilizing relaxation into the chelating intermediate. The study was

conducted on four β -esteracetanilides with spectral data indicating that the regioselectivity of the system was reverted back to the amide.

CP.U.15 Oneota Subsistence: An Analysis of Trash

Mikayla Hed

Mentors: Constance Arzigian, Archaeology & Anthropology; Amy Nicodemus, Archaeology & Anthropology

Faunal and floral remains in trash pit features are essential parts of the archaeological record. They provide indicators about past cultures and help create an understanding of what the environment may have been like during their time of use. These remains suggest: what was available and/or eaten, an estimate of feature use-life, the seasonality based on various modern resources, the approximate age of the animal, and the season when it died. Seasonality is of special importance to faunal analysis because it indicates what time of year a culture group may have hunted, and it leads to a better understanding of the subsistence behaviors of a culture group in general. This study examined faunal and floral remains of two Oneota trash pits features, F.717 and F.812 of the Gundersen Site from the Sandford archaeological Complex in La Crosse, Wisconsin. All faunal remains (including fish scales) from these two features were sorted, recorded, and analyzed. This data is the basis that indicates the use-life of the pit they came from and contributes to the understanding of subsistence behaviors of the Oneota. A separate party examined the floral remains, enabling a blind test comparing faunal and floral seasonal conclusions. Collecting and interpreting the data from these pits adds to a larger data base for assisting future archaeologists with their research, allowing for a better understanding of the Oneota.

CP.U.16 Quantifying Changes in Mass Balance and Surface Velocity of a Himalayan Glacier Using Repeat Unmanned Aerial System (UAS) Survey

David Holmes

Mentors: Nita Mishra, Geography & Earth Science

Glaciers and ice sheets are one of the largest reservoirs of fresh water on Earth and are projected to be significantly impacted by climate change as global average temperatures continue to rise. Mountain glaciers, especially in low latitude tropical areas, are significant indicators of existing climatic conditions and are sensitive to changes in temperature and precipitation patterns. Continuous availability of melt water from glaciers, especially during summer months, is important for populations in South Asia as it impacts food security, hydropower generation potential and human livelihoods.

CP.U.17 Creating Voices of La Crosse Walking Tours

Johnathon Jaeger and Sam Ott

Mentors: Jenny DeRocher, La Crosse Public Library Archives Associate Archives Librarian; Ariel Beaujot, History

Our project was to create historically themed walking tours that integrate Hear, Here stories. We planned to conduct two tours on Historic Downtown Day (Oct. 12th, 2019). To complete this project, we researched a diverse range of local history topics. We used a plethora of primary and secondary sources to contextualize the Hear, Here. We used multiple strategies to promote our tours. We created seven unique tours, including Preserving La Crosse, Purpose of a Park, Taking a Stand: Downtown La Crosse Protests, Red Light La Crosse, Ho-Chunk History, La Crosse's LGBTQ+ History. Through this project, we learned how to successfully use primary and secondary sources for professional history. We also became experienced in writing history for the public audience, both through the walking tours and the blog posts. Through both practice and guiding, the tours we worked on public speaking and presentation abilities. Finally, we adapted to changing conditions both in writing and conducting our tours.

CP.U.18 Effects of SK-03-92 on *Saccharomyces cerevisiae*

Jasper Kiefer

Mentor: Anna Galbraith, Biology

SK-03-92 is a potent antimicrobial that kills a wide array of microbes. At UWL, SK-03-92 and related compounds are currently being studied by numerous faculty members, graduate and undergraduate students to determine its effects on bacteria, nematodes, mammalian cell lines, and yeast (*Saccharomyces cerevisiae*). In yeast, SK-03-92 is only effective at killing the cells if they are allowed a two-hour grow-out period after dilution from an overnight culture. To analyze the reasons behind this requirement, spot assays were performed to determine the extent of kill of cultures treated with SK-03-92 at varying times after dilution. It has been hypothesized that mitochondria and/or ROS may be involved in the killing of yeast cells by SK-03-92. Therefore, yeast cells were examined by both a mitochondria specific and a ROS specific stain using fluorescence microscopy to observe any effects on yeast cells treated with SK-03-92 during the grow-out period. Results from these experiments will be presented.

CP.U.19 Biophysical Studies of a Protein of Unknown Function from Cancer-associated Murine Herpesvirus-68

Jamie Kloehn

Mentor: Kelly Gorres, Chemistry & Biochemistry

Members of the Herpesvirus family cause several types of diseases to its mammalian hosts, including infectious mononucleosis, Hodgkin's lymphoma, and primary effusion lymphomas. Herpesviruses are characterized by their ability to replicate and spread infection in the active lytic phase, but also maintain themselves within a host during the inactive latent phase. Within the gamma herpesvirus subfamily, a conserved protein of unknown function, with a highly conserved domain of unknown function, is expressed during the lytic phase. The protein was observed to be essential to viral replication during the lytic phase of infection when the gene was knocked out of the murine gammaherpesvirus-68 (MHV68). To characterize its biophysical properties, the protein of unknown function from MHV68 was purified. Analysis of the protein through Circular Dichroism spectroscopy determined the secondary structure to be predominantly alpha-helical. The thermal denaturation of the protein was pH dependent. Additionally, using a high throughput screen, the thermal stability of the protein was increased in the presence of small organic acids. The goal of the biophysical and structural analyses is to identify the function of the protein in the viral life cycle and to determine if the protein can be targeted to inhibit replication of gamma herpesviruses and their associated diseases.

CP.U.20 Ritual, Feasting, or Survival?: The Role of Context and Relationship in the Identification of Potential Ritual Deposits in two Oneota Pit Features.

Amy Kolly

Mentors: Connie Arzigian, Archaeology & Anthropology; Amy Nicodemus, Archaeology & Anthropology

Identifying and inferring instances of ritual, feasting, or starvation, depend upon data sets that can have multiple interpretations. Consideration of sociopolitical organization, language groups, and ethnographic accounts of related Oneota culture sites can provide insight as to what ritual, feasting, or starvation episodes might look like in the archaeological record.

CP.U.21 Emissions Permissions: A Study of California's Smog Check Program

Devyn Korish

Mentor: Mary Hamman, Economics

This paper seeks to determine the efficacy of California's Smog Check Program. The Smog Check Program regulates vehicle emissions by requiring biennial emissions testing. Between 2010 and 2017, California's fine particulate pollution level average was 22.7% higher than the next leading state, and 41.7% higher than the national average, leading them to implement and enforce emissions testing for vehicles to control pollutants (US EPA & US Census Bureau, n.d.). Heightened smog levels carry significant risk to humans and the environment, making them a major concern (Romley, Hackbarth, & Goldman, 2010). In this paper I use Multiple Regression models and a Synthetic Controls method to analyze the trends in vehicular pollutants across California counties with differing levels of

stringency of the Smog Check Program over time. The results of both methods show that there was not a significant change in vehicle related pollutants between the county that increased its program stringency to a higher level and the control groups that did not change.

CP.U.23 Electrodeposition of Zinc Nanoparticles for the Catalytic Conversion of CO₂ to CO

Yuanman Ma
Co-author: Sujat Sen
Mentor: Sujat Sen, Chemistry & Biochemistry

Unique properties of metallic nanocrystals have been used in different fields such as catalysis and sensing. Metal nanocrystals can be synthesized by many ways including electrodeposition. Herein, I present preliminary results on the deposition of zinc in the form of nanoparticles smaller than 250 nanometers, uniformly on the surface of a gas diffusion layer (GDL). My work demonstrates the effects of current density, charge density and pulsing time on the electrodeposition process. My goal is to use these nano-sized particles as a catalyst for the conversion of Carbon dioxide (CO₂) into Carbon monoxide (CO) at the three-phase interface of a GDL. While the former (CO₂) is a known greenhouse gas and industrial waste, the latter (CO) is a very useful industrial precursor that can be used to make a variety of commercial products including gasoline and plastics. The variation in catalyst layer morphology is known to strongly correlate with its performance inside a flow-type electrochemical cell. My preliminary efforts with catalyst testing show that more uniformly dispersed catalysts with less particle agglomeration leads to better performance in a flow cell.

CP.U.24 Organic and Carbonate Content from a Lake Sediment Core, South Central Wisconsin

Carly Martinco
Mentor: Joan Bunbury, Geography & Earth Science

Lake sediment cores are valuable in assessing a region's past environmental conditions, from the material contained within them. A 9.5-meter sediment core was collected from Mud Lake, located in Jefferson County, Wisconsin, in July 2019. The goal of this project is to create a full post-glacial climate record of this region by analyzing the sedimentary properties and biological remains found within the core. Changes in organic and carbonate content were determined, using sediment loss-on-ignition (LOI). Preliminary results of the top 1.5 m of the core indicate that organic content ranges from 17 to 33% and carbonate content between 32 and 42%. Considerable variability exists in the organic content record below 1.5 m, while carbonate content remains steady around 42%. There is a dramatic increase in organic content corresponding with a decrease in carbonate around 7.7 m. A chronology using radiocarbon dated materials will be assigned to the sediment layers to determine the timing of these variations and allow the comparison of these LOI records with other paleo-environmental studies from the region.

CP.U.25 Identifying the Mechanism of Stem Cell Differentiation arrest in the CRISPR-edited Mutant Myoblast Cell Line containing a Calmodulin Mutation

Emily Mauch and Jennifer Klein
Mentor: Jennifer Klein, Biology

The goal of this experiment is to identify the mechanism of stem cell differentiation arrest in the CRISPR-edited mutant myoblast cell line containing a calmodulin mutation. It is known that stem cell differentiation is impaired with aging. The mutation mimics the oxidation of calmodulin, as also occurs with aging. In order to attain this goal, various promoters' expression of GFP in muscle myoblast will be observed. Then myoblasts containing the calmodulin mutation will be transfected with the promoter with the greatest expression. The promoter will include a gene encoding a constitutively active calcineurin and CaMKII in order to see if differentiation can be rescued. These experiments will help us to understand what part of the myogenesis pathway has been disrupted by the calmodulin mutation.

CP.U.26 Is there a Correlation between Particle Size and Organic Matter in Sediment?

Olivia Meurette, Ryan Killmer, Austin Halley, and Danielle Mori
Mentor: Joan Bunbury, Geography & Earth Science

Sediment particle size analysis can provide information relating to the environmental changes that existed in the past. Through the analysis of core sediments from Mud Lake, located in Jefferson County, Wisconsin our goal is to determine whether there is a relationship between any of sand, silt, or clay-sized particles and organic matter content in the sediment core. Changes in temperature and precipitation over time influence the amount of sand, silt, or clay-sized particles that are deposited in a lake. This information can help us unravel what changes the climate went through in the past.

CP.U.27 An Exploration of Racial and Cultural Diversity through the Portrayal of African Americans in Advertising

Taylor Moore, Antoinette Muzi, and Patrick Froehlke
Mentor: Nese Nasif, Marketing

While analyzing the world of advertising, there are certain groups of people that have been inaccurately portrayed in the media over time. Across different types of advertising mediums, the minority group of African Americans can be contrasted to other cultural diversity groups in how they have been depicted or the lack thereof. These inaccuracies and misrepresentations have created stereotypes which have been carried into today's society where they continue to flourish. An investigation of ways and an analysis of the effects advertising has had on the African American community will explore the extent print and media advertising has had on African Americans and society's ideas surrounding the minority group. In order to mitigate the racial misrepresentation that continues to persist in advertisements of minority groups and cultures, proactive solutions and suggestions will be presented along with research and analysis.

CP.U.28 Investigation of Seasonal Changes in Glial Cells in the Hypothalamus, Hippocampus, and Cerebral Cortex of the 13 Lined Ground Squirrel

Andrea Ruzicka and Kadie Krzykowski
Co-authors: Grant Broeckel and Christine Schwartz
Mentor: Christine Schwartz, Biology; Grant Broeckel, Biology

The 13 lined ground squirrel goes through extreme neurological changes during hibernation. Previous research has shown that there is a significant difference in cell number in the cerebral cortex during hibernation compared to active, summer animals; however, it was not clear whether the cells were glial cells or neurons. Here, further research was completed focusing on quantifying the number of glial cells, specifically astrocytes, located in the somatosensory cortex, anterior cingulate cortex, motor cortex, lateral septum, and dentate gyrus. An immunohistochemistry protocol was utilized for staining of glial fibrillary acidic protein (GFAP), which is only found in astrocytes. By counting the number of cells expressing this protein, the number of astrocytes present in the specific brain regions across seasons of summer, torpor, and inter-bout arousal was determined. Our data shows there is a significant increase in area covered by astrocytes during torpor compared to summer in the brain regions of the somatosensory cortex, anterior cingulate cortex, and motor cortex. We are unable to determine if this change is due to a greater number of astrocytes or larger astrocytes during torpor with this method. Glial cells play a major role in supporting the neuron, and if the astrocyte count increases during hibernation, this could mean they are helping protect the neurons during this stage.

CP.U.29 Upregulation of the Ground Squirrel Platelet Proteome in Torpor

Katie Sebranek
Co-authors: Nick Kafkas, Rylee Stewart and Scott Cooper
Mentor: Scott Cooper, Biology

13-lined ground squirrels are effective hibernators that survive harsh conditions through altering their vital statistics. In the torpor phase of their hibernation cycle, body temperatures often fall into the range of 4-8°C and their heart rate has a

significant decrease to 3-5 beats per minute. To prevent extensive clotting, the squirrels' blood clotting cells called platelets go through several changes. Because platelets lack a nucleus, their proteome was studied to see if it underwent changes in response to environmental stimuli. While the human platelet proteome removes sialic acid residues from the surface proteins in response to cold temperatures, which renders platelets ineffective and flags platelets for clearance by the liver. Squirrel platelets did not go through this change. To determine how the platelet proteome is altered, blood samples were taken at different points in the hibernation cycle and the platelet proteins were quantified. Increased expression of proteins was observed in the torpor phase of the hibernation cycle. Specifically, albumin, APOA1, macroglobulin and Alpha-1 Antitrypsin experienced significant changes when the proteome was sequenced. Immunoblots were used to determine how these proteins could function as a protective mechanism for the squirrels in harsh conditions.

CP.U.30 The Role of the Matrix Protein N-Terminus on HPIV3 Budding

Fernando Souza

Mentor: Michael Hoffman, Microbiology

Human parainfluenza virus 3 (HPIV3) is a virus known for causing thousands of infant and child hospitalizations each year in the US. Despite this, there is currently no treatment or vaccine for the disease. In order to better understand how this virus replicates and to potentially identify targets for drug development, a preliminary study was performed on the role of the amino-terminus region of the matrix (M) protein in HPIV3 assembly and release from the host cells. This was done by performing a release assay to compare normal wild-type M protein with amino-terminal deletion M proteins. In these experiments, low levels of the amino-terminal deletion M proteins were seen within the cells. This indicates instability in the deletion mutants, potentially because the deletions altered protein folding. Because expression of the deletions mutants was so low, meaningful assessment of their release activity was not possible. A potential way to fix this may be to perform site directed mutagenesis in the amino terminal region to get structurally stable protein without a functional amino terminus.

CP.U.32 Effects of the Stilbenoid Compound CL-5 on *Saccharomyces cerevisiae*

Ger Thao

Mentor: Anne Galbraith, Biology

SK-03-92 is an antimicrobial derived from a compound that was purified from *Comptonia peregrina*, or sweet fern, by researchers at UWL. SK-03-92 has been shown to effectively decrease yeast survival at a concentration of 8ug/mL. CL-5 is a second derivative compound that decreases survival of the nematode worm *Caenorhabditis elegans*. Despite their related chemical structure, and the fact that both SK-03-92 and CL-5 kill bacteria, CL-5 was not able to decrease yeast survival at concentrations similar to those used for SK-03-92. Therefore, we decided to test whether CL-5 would affect yeast survival if we used higher concentrations of CL-5. Using a spot assay developed in our lab, yeast cells were treated with concentrations of CL-5 at both 16 and 32 ug/mL to determine if yeast growth was affected. In addition, microscopy was used to examine any morphological changes in yeast treated with CL-5 to see if CL-5 treated yeast shared morphological responses with SK-03-92 treated yeast. It was concluded that CL-5 does affect yeast cells when used at a concentration of 32 ug/mL.

CP.U.33 The Effects of Cystine Transporter Inhibition on the Epstein-Barr Virus and Burkitt Lymphoma Cells

McKenna Theine

Mentor: Kelly Gorres, Chemistry & Biochemistry

The Epstein-Barr virus (EBV) is a herpesvirus that causes infectious mononucleosis and undergoes two main cycles. The first is the latent, or inactive cycle, in which the virus expresses only a limited number of its genes to keep itself present and alive within the host. The second is the lytic, or active cycle, where the virus actively replicates in the host and continues to infect other cells. The mechanism of transformation between these two stages is still unclear, however, drugs have been discovered that either induce or inhibit the virus. The virus infects B-cells which are a major part of our immune system and protect the body against disease. EBV has also been linked to different types of lymphoma cancers. Testing drugs that connect the lymphoma cancer and EBV connection can prove to be an interesting path of study. Cystine, a sulfur containing amino acid, is brought into the cells via a cystine/glutamate transporter that is composed of

two subunits, the xCT subunit and the CD98 subunit. Once imported, the cystine is reduced to cysteine which is required for the growth of cancer cells. Erastin, sorafenib, and sulfasalazine are known inhibitors of the xCT subunit and thus of the transport of cystine. In treating the cells with varying concentrations of these drugs, we can determine their effects on the EBV lytic cycle as well as Burkitt lymphoma cells.

CP.U.34 Using the Stoughton Historical Museum Legacy Collections for Research and Education

Kimberly Thompson

Mentors: Constance Arzigian, Archaeology & Anthropology; Heather Walder, Archaeology & Anthropology

The Stoughton and Lake Kegonsa area in southcentral Wisconsin has been continuously occupied by people for over 10,000 years. As part of its exhibit on this extensive Native American occupation, the Stoughton Historical Museum displays four collections of archaeological artifacts: stone projectile points in wooden cases, donated by avocational collectors with little provenience information. These “legacy collections” are left uninterpreted in the exhibit. Despite their shortcomings, these collections can still be valuable for archaeological research and interpretation. The 179 projectile points and tools were analyzed to determine their raw material, type, and cultural affiliation; and subsequently these data were translated into interpretive exhibit labels for the museum. This project demonstrates how legacy museum collections can contribute to a further understanding of an area’s past for both researchers and the public.

CP.U.35 Effects of Schedule Disruptions on Circadian Activity Rhythms

Gaoying Vue, Ashton Osterhaus and Dylan Tousey

Mentor: Alder Yu, Biology

Circadian rhythms are the natural cycles in an organism's body that causes changes in physical, mental, and behavioral systems. Circadian rhythms allow organisms to take advantage of their environment by anticipating the patterns of the light and dark cycle within a day. Shift workers often have unusual exposure to light/dark periods due to changing work schedules. This has been shown to have health detriments. To better understand this, effects of different light/dark periods on an organism's circadian rhythm were researched. Using fruit flies as a model organism, the Drosophila Activity Monitor (DAM) system and the Shiny R-DAM analysis program were used to mathematically characterize the activity rhythms. We analyzed amounts of activity over time at different times of day and the overall period of the rhythms. With a constant light cycle, we have shown that constant light suppresses the circadian rhythms. Current research focuses on alternating the lighting periods (8 hours light and then 8 hours dark) to simulate shift work and the effects of mutant genes on circadian rhythms. We expect it to be possible to disrupt circadian rhythms using either genetic methods or altered light dark cycles. These results will enhance our understanding of how changing circadian rhythms affect human shift workers.

CP.U.36 Characterizing Suppressor Mutations that Restore *Myxococcus xanthus* Motility

Kieran Young, Mathew Vanselow & Molly Coenen

Mentor: Dan Bretl, Microbiology

Myxococcus xanthus is a ubiquitous soil bacterium that uses cooperative motility to form hunting groups, preying on other soil bacteria for nutrients. This predatory behavior and many other *M. xanthus* processes are regulated by two-component signaling systems (TCS). TCS consist of a histidine kinase (HK) and a response regulator (RR). When a HK is stimulated by an environmental signal, it phosphorylates a RR which then regulates transcription of specific genes usually involved in the response to that environmental signal. In *M. xanthus*, PilR is a necessary RR for motility. Interestingly, pilR itself is regulated by another TCS named the NtrC-like Modulator of Pili (Nmp) TCS and mutations in nmpR (a RR) can restore motility even in the absence of pilR. We are investigating how different mutations of nmpR alter the motility phenotype of the non-motile *M. xanthus* Δ pilR Δ nmpR strain. To do this, plasmids containing known nmpR mutations have been transformed into the *M. xanthus* Δ pilR Δ nmpR strain. Resulting strains will be assessed for motility. We hypothesize that mutations that restore motility will do so by mimicking phosphorylation on the RR. Overall, these results will improve our knowledge of how mutations can lead to restoration of genes regulated by TCSs.

CP.U.37 Rainbow Solutions to $x+y=z$ in $[m] \times [n]$

Laura Zinnel, Kean Fallon & Joe Miller

Co-author: Nathan Warnberg

Mentor: Nathan Warnberg, Mathematics & Statistics

Rainbow Solutions to $x + y = z$ in $[m] \times [n]$

Kean Fallon, Joe Miller, Nathan Warnberg, and Laura Zinnel*

Department of Mathematics and Statistics, University of
Wisconsin-La Crosse

February 14, 2020

Consider the equation $x + y = z$ and the set of integers $[n] = \{1, 2, 3, \dots, n\}$. A **solution** to the equation is a set of three integers that satisfy the equation. For example, $\{2, 5, 7\}$ is a solution in $[8]$ but $\{3, 8, 11\}$ is not a solution in $[10]$ since 11 is not in $[10]$. Now we are going to color each integer in $[10]$ and let $r = \text{red}$, $b = \text{blue}$, $g = \text{green}$ and $y = \text{yellow}$.

1	2	3	4	5	6	7	8	9	10
<i>r</i>	<i>b</i>	<i>r</i>	<i>b</i>	<i>g</i>	<i>g</i>	<i>y</i>	<i>r</i>	<i>y</i>	<i>b</i>

Once a set of integers has been colored we can describe a rainbow solution. A **rainbow solution** is a solution where each element in the solution is a different color. Thus, $\{3, 4, 7\}$ is a rainbow solution and $\{1, 3, 4\}$ is not. The problem we will be discussing is how to use as many colors as possible while avoiding rainbow solutions.

In particular, we will be looking at coloring and adding pairs of integers in $[m] \times [n]$. For example, $\{(2, 3), (1, 5), (3, 8)\}$ is a solution to $x + y = z$ in $[4] \times [8]$ but is not a solution in $[4] \times [5]$ since $(3, 8)$ is not in $[4] \times [5]$.

DP.U.1 Assessment of Mercury Contamination from Legacy Fur Trade Activity in Soil of Grand Portage National Monument, MN

Reece Banta
Mentor: Kristofer Rolfhus, Chemistry & Biochemistry

Mercury (Hg) is a toxic substance which negatively affects the nervous systems of both humans and wildlife. Previous studies have indicated high levels of mercury in biota, soil, water and sediment samples taken from within Grand Portage National Monument (GRPO). These high levels of contamination are believed to be connected to the fur trading routes of the 1700-1800s when French Voyagers began using the area as a base for trade with native peoples using the highly prized, mercury-bearing ore, vermillion. Soil samples were collected from trade depots Fort Charlotte and Fort XY in May and September of 2019. The samples were analyzed at UW-L via thermal decomposition/atomic absorption spectroscopy for total mercury concentration. Results confirmed dangerously high levels of mercury in soils at both forts, the highest samples almost 100-fold greater in concentration than regional background soils. Stable isotopes will be employed to confirm whether these high levels of contamination are connected to the vermillion-ore residue. This not only has important historical and archeological significance but is essential data which has been made available to the National Park Service in Grand Portage, who are considering limiting access to such areas of high contamination due to safety concerns.

DP.U.2 Mirror, Mirror Near a Star

Hannah Betchel and Jamin Wilson
Mentor: Shauna Sallmen, Physics

An exoplanet is a planet orbiting another star. A star's habitable zone (HZ) is the region around a star where an exoplanet could have an atmosphere and liquid water. For a variety of reasons, a civilization might wish to redirect starlight onto an exoplanet. Mirrors big enough to redirect a significant amount of starlight, yet light enough to require minimal fuel to launch & steer will be significantly affected by the pressure of starlight. Motions of mirrors affected by this radiation pressure (RP) are not well understood. Our team previously developed a package that uses python & REBOUND to simulate an individual mirror around an Earth-sized planet in the HZ of various stars. Currently it can simulate situations where the mirror directs sunlight to the center of the planet all the time, only when the mirror is on the exoplanet's dark side, or not at all (used to test for stability when the only force is gravity). We have simulated initially circular orbits around exoplanets near the inner edge of the HZ for stars with six different power outputs and masses. The simulations include the various RP types as well as mirrors with different orbit sizes and orbit orientations. The long-term goal is to identify potentially viable (quasi-stable and/or fuel-efficient) mirror orbits. We will present an overview of the results (e.g. survival times for the various simulations), along with detailed results for a subset of the 216 simulations.

DP.U.3 Stressed to the Max: How Financial Stress Links to Students' Academic Decision Making

Alexis Condy and Hannah Bontrager
Mentor: Bianca Basten, Psychology

Research shows that students face high levels of stress and that stress can influence decision making. Under stressful situations, individuals are more likely to make fast decisions that are prone to errors. One major stressor that is consistent for many students is financial stress. The proposed study uses a survey to examine the link between financial stress in college students and their decisions in regards to academics. We predict that higher levels of financial stress are linked to poorer academic decision making overall and, more specifically, decisions that are less advantageous for students' future career or academic goals. Results may have implications for how we talk to students about finances and academic decisions and may support the argument for the need for policy reforms regarding tuition, paid internships, etc.

DP.U.4 Charcoal Analysis of a Mud Lake Sediment Core to Determine Anthropomorphic Impact

Alydia Downs, Amy Kolly, Zoe Reissner, and Taylor Prill
Mentor: Joan Bunbury, Geography & Earth Science

A lake sediment core taken from Mud Lake, located three miles from Aztalan State Park, is being analyzed to determine if there is a correlation between charcoal levels from before, during, and after the decline of Native American settlement at Aztalan. Charcoal is well preserved in lake sediments and can be used to understand fire frequency, which can then be used to infer past environmental conditions. Evidence shows that Aztalan settlement left a physical mark on the Wisconsin landscape when the Mississippian people were using it to meet their needs. Sediment cores are being subsampled and processed using standard methods, and charcoal is being identified using a magnification of 10-20x. This analysis will be used to measure the level of human impact of occupation Aztalan settlement as evidenced by the quantity of charcoal within the lake sediment core during the occupation of Aztalan. Charcoal sources associated with human activity include manmade fires for land clearing and the burning of organic material as an energy source for daily needs. In addition, data will be compared to pollen level findings to determine if charcoal quantities correlate.

DP.U.5 The Effect of Visual Feedback Concerning Dynamic Stability on Female Landing Mechanics

Megan Frueh, Briana Nelson, Morgan Scheider, and Tyler Tatro
Mentor: Naghmeh Gheidi, Exercise & Sports Science

Anterior cruciate ligament (ACL) injury is a common landing injury amongst females. Landing is a risky movement requiring proper balance. Improving one's balance would reduce their risk of injury. The dynamic postural stability index (DPSI) represents an individual's ability to maintain balance. The purpose of this study was to examine the effect of a DPSI visual feedback on female landing mechanics. Participants performed three sets (pre-test, feedback, and post-test) of five single-leg barrier jumps. Kinematic and kinetic data were collected at 200 Hz and 1000 Hz, respectively, using 10 Vicon cameras and an AMTI force platform. Reflective markers on anatomical landmarks were used to create a musculoskeletal model. xGen software package were utilized to create feedback representing DPSI in bar graphs for repetitive landings. The landing mechanics including knee flexion angle, vertical ground reaction force (VGRF), and balance were compared between pre-test and post-test. Analysis of variance (ANOVA) with an alpha level of 0.05 was used to determine the effect of feedback on landing mechanics. The results of this study could be useful to athletes, coaches, and members of the healthcare team for their activities, training, and rehabilitation.

DP.U.6 Pulse Plating of Alloy Nanoparticles onto Gas Diffusion Layers for the Electroreduction of Carbon Dioxide

Lee Fuller
Co-author: Sujat Sen
Mentor: Sujat Sen, Chemistry & Biochemistry

By combining carbon dioxide (CO₂) with electricity derived from renewable sources such as solar power, we can provide a sustainable pathway to generate fuels and useful chemicals. Prior research has shown that alloys of copper (Cu) with metals such as tin (Sn) have the ability to catalytically convert CO₂ into economically useful products such as formate. Varying the particle size, surface morphology and composition of these catalysts have been shown to dramatically change its electrocatalytic properties. Recent reports have also demonstrated the electroreduction of CO₂ at high rates (or current densities) by the use of catalyst loaded gas diffusion layers (GDLs). Herein, we discuss a pulse electroplating method for preparing nanoparticle alloys of Cu and Sn directly on the surface of hydrophobized GDLs. This allows the gas-phase delivery of CO₂, enabling higher conversion rates, as demonstrated by current densities of the order of ~ 150 mA/cm². We demonstrate the potential for significant enhancements in catalytic activity due to 1) increased control of particle size, as well as 2) tunable catalyst composition.

DP.U.7 Applying DStretch and 3D Photogrammetry to Rock Art and Rock Shelters at Silver Mound in Jackson County, Wisconsin

Mikayla Gefeke
Mentors: David Anderson, Archaeology & Anthropology; Constance Arzigian, Archaeology & Anthropology

As technology has advanced, a lot of it has been adapted for use in archaeological research. These new technologies allow archaeologists to better find, document, and interpret sites and artifacts. DStretch and 3D Photogrammetry are just two of the programs and techniques developed and adapted for use in archaeology. DStretch is a program that was developed for the study of rock art and uses decorrelation stretch to enhance the differences between colors. It is particularly useful for enhancing the visibility of faint rock art. 3D Photogrammetry is the process of taking overlapping photos of an object or site to digitally create a three-dimensional model of the object or site. This research applies both DStretch and 3D Photogrammetry to two rock shelters at Silver Mound in Jackson County, Wisconsin, one of which has documented rock art. By combining these techniques, any visible and/or faded rock art in the shelters is documented and preserved in its 3D geographical context, from which new interpretations can be made.

DP.U.8 Inhibition of the Reactivation of the Epstein-Barr Virus by Atypical Antipsychotics

Nathaniel Hoffman
Mentor: Kelly Gorres, Chemistry & Biochemistry

As much as 95% of the human population harbors an Epstein-Barr virus (EBV) and though these infections often have little to no effect this virus has been linked to several cancers. During the course of an EBV infection the virus will switch between the latent and the lytic stages of its lifecycle. While in the latent stage the virus resides in the host cell's DNA and is essentially dormant. However, during the lytic stage of its lifecycle the virus is able to proliferate and spread. Our lab has recently discovered that atypical antipsychotics, generally used to treat bipolar disorder, can inhibit the activation of the lytic stage in EBV in certain cancer cells. This is important as it is during proliferation and insertion into the DNA of the host cell. It is believed that this insertion and the resulting changes in the DNA are key to the mechanism in which the virus can cause cancer. We are now elucidating the cellular receptors responsible for this mechanism. We believe that the receptors that recognize serotonin and dopamine are the likely involved in this mechanism and are therefore they are the first receptor to be investigated. If this can be confirmed it would provide a possible target for future research into this virus which currently has no cure and very few treatments.

DP.U.9 Surface Modification of Substrates with Electrically Conductive Polymers to Prevent Catalyst Erosion

Colin Johnson
Co-author: Rylie Gramann
Mentor: Sujat Sen, Chemistry & Biochemistry

The primary byproduct of the combustion of fossil fuels is carbon dioxide (CO₂), a known greenhouse gas and currently a waste material. With increasing use of solar-based electricity across the world, we also need to develop ways of efficiently storing large amounts of electricity collected during the day and use it later at night. By reacting this electricity with CO₂, we can generate useful chemicals such as methane, effectively storing the electricity in the form of chemical bonds. In order to do this process quickly and on a large scale, we have been using gas diffusion layer (GDL) substrates that are coated with catalyst particles. Based on recent observations, these catalyst particles can be lost by erosion during the testing in a flow cell. Herein, we will present recent results on the synthesis of a thin layer of an electrically conductive polymer called polypyrrole to the GDL surface to decrease erosion of these catalyst particles. Ultimately, this will increase the service life of GDLs; making catalysis of carbon dioxide more economically feasible on a large scale.

DP.U.10 A New Twist on Primate Foot Kinematics

Krista Johnson and Sam Friederichs
Co-authors: Sam Friederichs and Thomas Greiner
Mentor: Thomas Greiner, Health Professions

One of the characteristics that separates humans from other primates is bipedal locomotion, with the foot being one of the more unique anatomical features associated with human bipedalism. The purpose of this study is to analyze different joint kinematic responses an inversion-eversion driving motion in human (*Homo*), chimpanzee (*Pan*), and baboon (*Papio*) specimens. Data were collected by tracking infrared clusters pinned to specific bones on dissected cadavers. A researcher provided experimental input by conducting different driving motions that were later analyzed for interspecies

comparison. Through these driving motions and analysis, we found less mobility in the measures of human transverse tarsal joint mobility, which confirms recent findings of human transverse arch rigidity relative to non-human primates. Additionally, in all investigated primates, the talonavicular joint showed greater mobility response to inversion-eversion than did the subtalar joint. This finding contradicts conventional wisdom about the subtalar joint function in humans. Lastly, the talonavicular joint (medial foot) tended to display twice the mobility of the calcaneocuboid joint (lateral foot). This disparity appears to be made up by mobility of the more distal lateral tarsometatarsal joints. These data analyses complicate the story of the evolution of the human foot.

DP.U.12 Using Novel Genomic Sequencing to Assess the Overall Health of Wisconsin Grassland

Jacob Lindstrand

Mentors: Jennifer Klein, Biology; Anita Davelos, Biology

Large scale health of an ecosystem relies on multiple factors such as the abundance of species, diversity of species, or available nutrients in the environments. One under looked factor is the organic make-up of the soil. It is suggested that the biodiversity of soil could cause large scale effects on overall health of a biome. This study will sequence the genomic Deoxyribonucleic Acid (DNA) of soil which was collected in Wisconsin grasslands using nanopore flow cells. This data will then be analyzed looking for biodiversity, abundance, and identification of species in these soil samples.

DP.U.14 Particle Size Analysis of a Sediment Core from Mud Lake, Wisconsin

Ryan Lynch, Dylan Langer, Aiden Austin and Ryan MacDonald

Mentor: Joan Bunbury, Geography & Earth Science

A sediment core was collected from Mud Lake in Jefferson County, Wisconsin in July 2019. Mud Lake is a small, 70-acre kettle lake with a maximum depth of around 22 feet. The cores were collected at 43.05°N, 88.92°W. The ultimate purpose of the core is to determine past climate conditions in the region. We aim to find if there is a correlation between either sand, silt or clay particle sizes with the magnetic susceptibility measurements taken of the core. We anticipate that sand sized particles will be correlated with higher magnetic susceptibility based on the different minerals within the core and yearly infill of sediments. The findings of the correlation between particle sizes and magnetic susceptibility will be presented.

DP.U.15 The McKillip's: A Case Study of 19th Century Irish Immigrants in the American Midwest

Joel Martin

Mentors: Constance Arzigian, Archaeology & Anthropology; Kenneth Shonk, History

Irish immigration is a large part of the US's history, but most studies of Irish immigration focus on the Eastern Seaboard where the population of Irish was the highest. This creates an opportunity for study of Irish immigrants of the mid-19th century in the American Midwest. One such family, the McKillip's, who settled in the town of Wauzeka, in Crawford County Wisconsin allow a case study comparing how the Irish fared in the Midwest and New England. The sense of community in the Midwest and its differing culture was more welcoming to the Irish than New England which remained much more culturally similar to England. Most immigrants in the East were laborers while the Midwest's territorial status made purchasing of land possible. The Midwest's Catholic German population and small overall populations made the Midwest more similar to Ireland than New England. These factors combined to make the Midwest a better final destination for those Irish immigrants who continued inland upon their arrival.

DP.U.16 Creating a Paleoenvironmental Record of Frequency and Magnitude of Fires in Central Wisconsin from Sediment Core Charcoal Deposits - Mud Lake, Wisconsin

Carly Martinco, David Holmes and Sophie Pitney

Mentor: Joan Bunbury, Geography & Earth Science

Historical records of fire can be used to identify and determine past climates and environmental conditions, such as timing of droughts and changes in land use. One way to create these historical records is by analyzing lake sediment

cores for charcoal. In July 2019, a 9.5-meter sediment core was collected from Mud Lake in central Wisconsin. The core is currently being subsampled a 1-cm increments and processed using standard methods to concentrate the charcoal. Though the subsampling and counting are not yet complete, our preliminary results show the upper levels of the core have minimal amounts of charcoal indicating that there have been few fires in the Mud lake region in recent history. Data extending further down in the core will also be presented.

DP.U.17 Effectiveness of SK-03-92 Treatment against *Saccharomyces cerevisiae* and *Candida* Sp.

Rebekah Peplinski
Mentor: Anne Galbraith, Biology

Scientists at the University of Wisconsin - La Crosse have extracted a stilbene compound from *Comptonia peregrina* (sweet fern) that was then developed into a patented antimicrobial compound called SK-03-92. Utilizing *Saccharomyces cerevisiae*, we have been studying the mechanism of action of this compound to determine the effectiveness of SK-03-92 as a potential antifungal. First, MIC assays were conducted to find the minimum concentration needed for SK-03-92 to effectively inhibit the growth of *S. cerevisiae* under various conditions. The effectiveness of SK-03-92 was also tested against two medically relevant fungal species, *Candida albicans* and *Candida glabrata*. Treated *Candida* cells were also examined microscopically to observe any morphological responses of the yeast cells to SK-03-92 treatment. Finally, MIC assays were performed to test a potential synergistic relationship between SK-03-92 and a polymyxin compound colistin against *S. cerevisiae*. Results from these experiments will be presented.

DP.U.19 Effects of Antioxidants on Yeast Growth after Treatment with the Antimicrobial SK-03-92

Rosa Salas
Co-author: Aaron Simoni
Mentor: Anne Galbraith, Microbiology

SK-03-92 is a compound developed by researchers at UWL in collaboration with scientists at UW-Milwaukee. Using a ROS specific stain and fluorescence microscopy, it was determined that yeast cells treated with SK-03-92 produce ROS (reactive oxygen species) that may be responsible for the inhibitory effects of SK-03-92 on yeast growth. This led to the question of whether antioxidants could ameliorate the effects of SK-03-92 on yeast cells. The first antioxidant tested was ascorbic acid at two different concentrations. Yeast cultures were treated with either DMSO (control), SK-03-92, ascorbic acid, or ascorbic acid + SK-03-92, and samples were taken after various times of treatment and spotted onto a YPD plate to determine the extent of yeast growth. Ascorbic acid did not appear to prevent the effects of SK-03-92 on yeast cells. In fact, the combination of SK-03-92 and a high concentration of ascorbic acid appeared to enhance the kill after 24 hours. The second antioxidant tested was melatonin, again using two different concentrations. Contrary to the ascorbic acid results, melatonin did appear to ameliorate the effects of SK-03-92 after 24 hours of treatment.

DP.U.20 Fascism's Failure in Interwar France: An Analysis of France's Reactions to Counter Fascism.

Stephen Schallert
Mentor: Regina Goodnow, Political Science & Public Administration

During the Interwar years, new ideologies began to form and take hold in countries around the world; one such ideology was fascism. Fascism was different depending on the country that it was adopted by, but generally it had strong anti-communist sentiment. With the economic downturn of the world economy, and the damage of the First world war in Europe Fascism (Italian fascism) took hold of the Italian government as Mussolini became the prime minister in 1922 and a dictator in 1925, and Germany also became fascist as Hitler and the Nazi party took the chancellorship in 1933 and became a dictatorship in 1934. Both countries saw the fascists/Fascists going against communists in the politics of the country. However, despite France's weakened stability and communist and socialist parties, the fascist were unable to gain power There were fascist parties in France during the interwar period such as the Croix de Feu (Cross of Fire); however, they were unable to gain control and were, along with other fascist parties, staved off by the French Popular Front, a coalition of parties against fascism. Fascist would not control France until after the establishment of Vichy France as a puppet of Nazi Germany during World War Two. This research was aimed at explaining why fascism failed in France despite succeeding to take hold in Italy and Germany.

DP.U.21 Ancient Palestinian 3 Child Jar Burial: Migration, Diffusion, or Local Conception?

Olivia Schauls

Mentors: Amy Nicodemus, Archaeology & Anthropology; Mark Chavalas, History

This research examines the mortuary practice of jar burials during the Middle Bronze Age in Ancient Palestine. Questions, such as, “where did the influence of jar burial mortuary practices start” and “why is a jar burial containing three children so special”, are at the fore-front of this analyzation.

DP.U.22 “We Are Like Feminist Heroes Right Now”: A Study of Female Sexual Empowerment Communication for Female-Identifying Viewers of *Broad City*

Samantha Stroozas

Mentor: Evan Brody, Communication Studies

Viewers are never passive in their engagement with media. For female-identifying viewers, media that interacts with sexual elements is often limiting and counter-productive, only permitting them to exist in realms of hyper sexualization or puritan innocence. This study aimed to further expand the narrative of female-identifying viewers and their relationship with female sexual empowerment communication, specifically with the Comedy Central show *Broad City*. This study used semi-structured interviews to further uncover the role that issues such as sex positivity, masturbation, feminism, orgasms, and more play in female sexual empowerment communication between viewers of *Broad City*.

DP.U.23 College Classroom Participation: Understanding Student Participation in the Classroom

Kyle Tanis

Mentor: Michael Tollefson, Communication Studies

The purpose of this study was to gain a better understanding of the reason’s college students participate in whole classroom discussions, including how factors in the classroom and their relationship with their instructor influence their reasons. Thirteen students gave their own definitions, examples, and perceptions on participation in the college classroom through this study’s method of conducting semi-structured interviews. Students reviewed the costs and benefits they experience in their relationship with their professors through the lens of social exchange theory. The results from this study defined participation in the college classroom as students being active and attentive in class through various activities. Factors such as class size, silence, student and instructor engagement, and how well students feel comfortable in their class can influence whether they participate or not. Students look to gain benefits including various rewards and knowledge when engaging with their professors and want to avoid negative interactions with their instructors including being shut down by their instructors and being negatively judged.

DP.U.24 Comparing Interstellar Shells with Two Datasets

Owen Thompson, Alex Conley, and Raffy Traas

Mentor: Shauna Sallmen, Physics

Space is not empty; the interstellar medium (ISM) is the diffuse material between stars. Dying stars are known to push off large amounts of gas into the ISM. Neutral hydrogen (HI) in this gas emits 21-cm radio waves, revealing shell-like shapes in the ISM. These shells expand, cool, and interact with one another, affecting the evolution of our Milky Way Galaxy. However, a complete and unbiased sample of galactic HI shells does not exist, so these processes are not understood in detail. One recent catalog utilized Search for ExtraTerrestrial neutral hydrogen (SETHI) data to identify 74 previously unknown HI shells. Recently, new 21-cm data from the Galactic Arecibo L-band Feed Array (GALFA-HI) became available at a much greater angular resolution. While searching the GALFA-HI data, it became evident that being able to view more detail could lead to shell measurements that conflicted with those made using previous data. In particular, some simple-looking shells from the SETHI catalog appear to be complex interacting structures in the GALFA-HI data. To investigate how differences in data affect estimates of a shell’s properties, we and others have examined the 74 SETHI shells in both data sets. We will present our results of the comparison.

DP.U.25 Analysis of DcrB Protein Mutations in Bacterial Copper Resistance

Isaac Trocinski

Mentor: John May, Chemistry & Biochemistry

Salmonella enterica is a common bacteria responsible for many foodborne illnesses in the world today. In order for organisms to protect themselves against such harms, many cells will release copper, a metal, to prevent the growth of such pathogens. However, *S. enterica* interacts with copper in a way to decrease its toxicity and survive in normally deadly environments. In past experiments, I have performed tests on how one gene, *dcrB*, influences the ability of *S. enterica* to resist copper. These tests demonstrated significant differences of bacterial growth in copper when the gene is present versus when it is absent, indicating *dcrB* plays a vital role in copper resistance within a cell. In subsequent research, the stability of a formerly mutated DcrB protein was tested in a copper solution in order to discover specific interactions through thermofluor assays. The results demonstrated the protein was nonfunctional in both control and copper settings. Thus, in order to test for only copper-specific interactive sites on DcrB, nearby locations on the gene were selectively mutated by site-directed mutagenesis. These new mutants suggested these sites may be involved in copper resistance. The knowledge gained from this research is important in the development of future antibiotics against *S. enterica* that target specific copper resistance.

UNDERGRADUATE ORAL PRESENTATION ABSTRACTS

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

BO.U.42 Targeting Aid During Economic Downturn: Examining the Impact of the Hardest Hit Fund on Homeownership Rates and the Effectiveness of Economic Crisis Programs

Benjamin Taft

Mentors: Ming Tsang, Finance; Mary Hamman, Economics

This research aims to examine the impact of the Hardest Hit Fund on homeownership rates, following the U.S. financial crisis of 2008. The Hardest Hit Fund is part of the Troubled Asset Relief Program and aimed to provide funding to states “hit hardest” by the housing market and economic downturn. The purpose behind this research is to understand whether the eighteen states awarded funding under the Hardest Hit Fund were able to grow homeownership at a faster rate than the remaining states that did not receive or accept funding. Using American Community Survey data from the U.S. Census Bureau and the Bureau of Labor Statistics, this project will apply widely used techniques from econometrics to estimate policy impact. I hypothesize home ownership rates will grow at a greater rate in states that were awarded funding under the Hardest Hit Fund than in states that were not awarded funds, and rates of growth will be proportionate to funding received. These findings will provide insight into the structural benefit of federally sponsored economic programs and inform future policy programs.

BO.U.43 People, Space, and Death: The Changes of Mortuary Practices in Neolithic China

Hui Xin Wong

Mentors: Amy Nicodemus, Archaeology & Anthropology; David Anderson, Archaeology & Anthropology

“Seeing death as seeing life” is a fundamental view of burying the deceased in ancient China. Thus, funerary treatments of the dead represent the society at specific points in time, reflecting their social life and social organization. This research focuses upon the changes in mortuary practices during Neolithic China. Mortuary data are drawn from archaeological sites of the Yangshao culture and the Longshan culture along the Yellow River Valley in China. The research characterizes the changes in mortuary practices throughout the Neolithic China and examines how these correlates with broader changes in Neolithic society. Mortuary practices are studied by analyzing burial patterns, grave dimensions, grave goods, and how these relate to age, gender, status, and other social rules. In addition, GIS applications are used to map the spatial relationship between settlements and cemetery sites, which illustrates the connection between the living and the dead. Overall, comparison of mortuary practices as well as the spatial relation of human settlements and cemetery sites are expected to show distinct patterning across space and time that is associated with the development of more complex societies in ancient China.

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

CO.U.46 The Social Memory of the Chilean Protests of 2019: International Students’ Interpretation

Haylee Meyer

Mentor: Vincent Her, Archaeology & Anthropology

My name is Haylee Meyer. I am an undergraduate student who is completing the Archaeological Studies Major: Cultural Anthropology Emphasis capstone. I am enrolled in honors thesis which allows me to conduct my own research. My research examines the social memory of international students’ experiences during the Chilean protests of 2019. The purpose of this research is to analyze each individual story of Chile’s history during this time provided by the participating students. How did one student understand, feel, interpret this situation compared to another student based on their social, cultural, political and economic background? Does it affect their understanding of the situation that is occurring in Chile? These factors will be the basis of the research. I will present my findings at the Symposium. These

findings between international students' experiences will not only shed a light to what students experience while abroad, but also shed a light to what is not being talked about enough in our world.

CO.U.47 Cost of Chronic Pain

Rachel Selepa

Mentor: Mary Hamman, Economics

This research will look at how paid sick leave laws affect income levels and employment status for those with chronic pain. Paid sick leave policies have the potential to mitigate the assumed negative impact chronic pain has on one's income and ability to work. Data for this project comes from the Behavioral Risk Factor Surveillance Survey and the Federal Reserve Economic Data. Analysis will use multiple and generalized difference-in-difference regressions. We hypothesize that in states with paid sick leave laws, the difference in income level and employment status between those who suffer from chronic pain and those that do not is less than the difference between chronic pain sufferers and non-sufferers in states without paid sick leave laws. Our findings support that there is a negative correlation between income and employment and the number of days of poor physical health. These findings have the potential to support additional paid sick leave laws at the state or federal level.

Oral Session D

12:05-1:00 pm

DO.U.11 Combining Digital Methods for Archaeological Documentation: A Case Study from the Mut Temple Precinct

Sofia Kinzer

Mentors: David Anderson, Archaeology & Anthropology; Amy Nicodemus, Archaeology & Anthropology

By its very nature, archaeology is a destructive science. The data that we as archaeologists use in our analyses exists in the artifacts recovered during excavation and in the documentation that we keep during field seasons. In recent years, the methods which archaeologists use to document excavations have shifted toward the use of digital technologies such as 3-D photogrammetry, rather than hand drawings. Despite these advances, the dynamic nature of the excavation environment can still pose challenges in this area. Stark changes in light and rapid drying processes can greatly affect the visibility of features and stratigraphy, making them difficult to document. In order to combat this issue, research was done using data from the Mut Temple Precinct excavation in Luxor, Egypt to test a complementary method which combines the benefits of rapid capture offered by 3-D photogrammetry with the increased clarity provided by digital image enhancement techniques. The proposed method can help to combat the loss of information which results from the effects of the natural environment. While this method was tested using data from excavations at the Mut Temple Precinct, it may be broadly applied to other excavations where similar environmental challenges are presented.

DO.U.39 The Craft and Community of Reed Making

Alison Obright

Mentor: Johnathan Borja, Music

Within every great bassoonist, there lies an unknown but diligent reed maker. For players of double-reed instruments like the oboe and bassoon, the two carefully crafted pieces of cane that make up a reed are vital to beautiful tone and responsive performance. Methods and techniques of this craft are often passed down from teachers to their students, each musician changing the process to fit their specific needs, available materials, and personal superstitions. To learn these methods, I traveled to international bassoon camp Brooke Valley Bassoon Days in Lanark, Ontario to learn from professional, pre-professional, and amateur bassoonists about their unique approaches to bassoon reeds. The goal of my project is to better understand the craft of reed making to inspire musicians to take up the craft and inspire an appreciation for this often-hidden aspect of music performance. In my oral presentation, I will outline the process of bassoon reed making, explain how reeds work, and describe the important role community plays in the development of young musicians.

UNDERGRADUATE EXHIBIT PRESENTATION ABSTRACTS

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

BE.U.100 Recreating Ancient Egyptian Bronze Figurines Using Lost Wax Casting

Alydia Downs

Mentors: David Anderson, Archaeology & Anthropology; Brad Nichols, Art

3D printed replications of artifacts are useful for education but producing them has several complicating factors. The rows of plastic build-up are clearly visible, details are lost in the scanning process, and the plastic used to print is different in density and texture from the original artifact, which limits educational value. In order to experiment with making accurate replicas, I used 3D printed models of Ancient Egyptian artifacts provided by the Minneapolis Institute of Art to cast bronze replicas in the lost wax method. Different methods were explored to reproduce the original detail in the artifact: 1) casting the 3D printed plastic model as is into bronze 2) carving detail into the printed plastic before casting, and 3) dipping the plastic into wax first for easier sculpting before casting into bronze. By combining copper, tin, and lead, I produced a bronze alloy to more accurately recreate the historic artifact. I have evaluated these methods of production and have identified best practices, methodology, and a bronze alloy for casting 3D printed models of artifacts. Making models that are true to the original artifact in texture, weight, material, and detail will enhance the educational value of models and recreations, providing students with a hands-on approach to artifacts without using a real antique.

BE.U.101 Environmental Preservation through Photographic Recreation: Studying the Photography of Ansel Adams and Allen Smith in a Modern Context

Sydney Smith

Mentor: Kathleen Hawkes, Art

The culmination of my research, a series of 10 photographs, is a close study of changing landscapes. I studied the works of two photographers, Ansel Adams and Allen Smith, my grandfather. I returned to the locations they photographed, National Parks in the American West, to observe how these locations have changed over decades. This body of work inspires an appreciation for the natural world. During my travels park rangers inspired me with their devotion to preserving the natural landscape. *Photography* by Ansel Adams and Allen Smith were shot on film and printed in a chemical darkroom. I shot my pieces with a digital camera, but I rendered them in black and white to mimic the original works. Black and white photography focuses light as subject matter and transforms the landscape more easily into abstract compositions capturing the majesty of the natural world.

GRADUATE STUDENT ABSTRACTS

Poster Session A
8:50-9:45 am

AP.G.22 Child and Adolescent Perspectives on Relationships with Teachers and Caregivers

Anthony Bacchi
Co-author: Rob Dixon
Mentors: Rob Dixon, Psychology

This project aims to examine differences in child and adolescent perceptions of student-teacher relationships from an attachment theory perspective. Students' experiences within their caregiver-child relationships can predict their expectations and future interactions within student-teacher relationships. The current study looks at students' perceived relationships with their primary caregivers and favorite teachers to assess similarities and differences between fifth and eighth students and how we can better foster positive relationships with adults.

AP.G.23 The Acute Effects of Leg Press with Lower Extremity Vibration on Balance, Strength, and Gait in Adults with Parkinson's Disease

Laura Berry, Nicole Bogenreif and Megan Siekert
Co-authors: Inga Cluppert and Kristin Greany
Mentor: John Greany, Health Professions

Purpose: The aim of this study was to investigate the acute effects of a semi-recumbent therapeutic vibration system on balance, strength, and gait variables in subjects with Parkinson's Disease (PD). Subjects: Sixteen community-dwelling adults (7 males and 9 females, 74.9 ± 7.6 years) with a diagnosis of PD. Participants were recruited from a community based physical activity program. Methods: Participants completed one ten-minute session on a therapeutic vibration system. Pre-posttest measures were recorded for balance, functional strength, and gait. These were assessed using a force platform, Four-Square Step Test (FSST), Five Times Sit-to-Stand Test (5XSTS), 13-Step Stair Climb, and an electronic walkway sensor mat. Results: A single session of therapeutic vibration did not produce differences ($p > 0.05$) in any of the three domains of interest. There were no differences in any variables of balance ($p > 0.05$). Functional strength tests did not show any differences; the mean time to complete the 5XSTS was 11.1 ± 4.8 sec for the pretest and 10.8 ± 4.4 sec for the post ($p = .46$). A similar pattern was noted for the stair climb test ($p = 0.57$). Finally, temporal and spatial characteristics did not show any differences ($p > 0.05$). Effect sizes were small for all measures ($< .20$). Conclusion: One session of a therapeutic vibration system did not impact balance, functional strength, or gait characteristics in a population of community dwelling elderly with PD.

AP.G.24 Physical Activity: The Impact on Mental Wellness in Adolescence

Melissa Brant
Co-author: Jocelyn Newton
Mentor: Jocelyn Newton, Psychology

As need for mental wellness increases, it is important that schools have resources to support students. One way that school psychologists can promote students' mental health is by investigating the positive effects of physical activity. This study investigates the predictive relationship of physical activity on general life satisfaction. With this knowledge, schools may be able to incorporate physical activity into mental health interventions.

AP.G.25 Effects of Four Weeks of Active Seated Leg Press Vibration on Balance in Healthy Young Adults

Ashley Butalla, Kirstin Klemp, and Matthew Weinhold
Co-author: Steni Sackiriyas
Mentor: Steni Sackiriyas, Health Professions

Objective: Most vibration studies required participants to stand while receiving vibration in the past. Our purpose was to examine the effects of four weeks of seated leg press vibration on balance. We hypothesized that static and dynamic balance would improve. Methods: Sixteen participants received ten minutes of vibration to their feet in a seated position, twice a week for four weeks. We measured movement velocity, maximum excursion, and directional control to test dynamic balance. For static balance, subjects stood on one leg with eyes open and closed on a force platform. We measured the Center of Pressure (COP) variables - 95% confidence ellipse, average velocity, and standard deviation of COP in the X and Y directions. Results: There were significant differences in measures of directional control ($p=0.010$), maximum excursion ($p=0.016$), and average velocity ($p=0.049$) over time. This increase suggests an improved control in dynamic balance. The static balance measures of COP were not significant over time ($p > 0.05$). Conclusion: Dynamic standing balance may be improved with seated leg press vibration. Static balance may not improve with this protocol; however, it is not detrimental.

AP.G.26 Impact of Trauma Training on Preservice Teachers' Knowledge and Attitudes

Joel Delwiche
Co-author: Betty DeBoer
Mentor: Betty DeBoer, Psychology

Childhood trauma is associated with many negative consequences that impact a child in the classroom. While many current teachers receive trauma-informed care (TIC) training, it may be more beneficial to provide this training to preservice teachers. The purpose of this study is to examine the impact of TIC training on preservice teachers' knowledge and attitudes towards TIC. The implications for school psychologists' roles as consultants will be discussed.

AP.G.27 Angular Relationship between the Anterior and Posterior Cruciate Ligaments of the Knee

Kayla Goetz, Hannah Knutson, Mary Parrott, Andrew Schmalz, Alex Weidbusch, and Kyle Zychowski
Co-author: Thomas Greiner
Mentor: Thomas Greiner, Health Professions

Background: The goal of this study was to determine the angular relationship between the anterior cruciate ligament (ACL) and posterior cruciate ligament (PCL) of the knee. Previous research has identified an average ACL-PCL angle of 61° at 90° ($\pm 2^\circ$) knee flexion. Methods: Dissected knee joints measured to 100-105 degrees of flexion, identified the medial edge of the anterior and posterior ligaments and digitized their proximal and distal attachments. Converted vectors were used to calculate the cross products to determine the angular relationship of ACL and PCL. Results: A mean angle between the ACL and PCL of 60.89° was measured. Discussion: Overall, the results show that variability of the ACL/PCL angle exists between subjects and side to side within subjects. The relationship between these essential ligaments directly affects the stability of the knee joint. Clinically, it may be important to consider the shear and rotational forces of both the ACL and the PCL collectively when rehabbing individuals with knee ligament injuries.

AP.G.28 Sense of Belonging: Impacts on Students of Color

Jordan Jozefacki
Co-authors: Dan Hyson and Jocelyn Newton
Mentors: Dan Hyson, Psychology; Jocelyn Newton, Psychology

Previous studies have demonstrated the powerful impact of belonging on educational, psychological, and social outcomes for students. These implications are found to be especially impactful for students of color when compared to White peers. Further, belonging is found to be a predictor of well-being for students. The present study seeks to investigate the effects of sense of belonging on overall well-being for students of color, as well as discuss implications to practice for practitioners.

AP.G.29 The Impact of Children's Mental Health Training on Paraprofessionals

Ryan Kruser

Co-author: Betty DeBoer
Mentor: Betty DeBoer, Psychology

Mental health is an important component of trauma informed care in schools, with student mental illness being linked with poor child outcomes. Research shows that teachers and paraprofessionals do not receive adequate training and lack confidence in supporting students with mental health difficulties. The results of this study will show the effects of mental health training on paraprofessional knowledge and self-efficacy. This will help inform school psychologists in future mental health training in schools.

AP.G.30 Development of a Serum-Antibody Test Specific to a Bacterium Associated with Rheumatoid Arthritis

Andrew LeSage
Mentor: Bernadette Taylor, Microbiology

Rheumatoid arthritis (RA) is an incurable inflammatory autoimmune disease of synovial joints that affects nearly 1% of the global population and an estimated 1.36 million Americans. The disease has significant economic impacts—resulting in annual healthcare expenses totaling \$19 billion annually. Pathogenesis is driven by a complex interplay between genetic and environmental factors. Recent literature suggests the presence of microbial communities in synovial joints and further analysis has revealed several species of bacteria of synovial microbiome that are almost exclusive to RA patients, suggesting involvement of the synovial microbiome in the pathogenesis of RA. This project aims to develop an assay capable of detecting an immune response to differentially expressed bacterium of the synovial microbiome of RA patients. Such an assay would prove invaluable to current diagnostic capabilities and warrants consideration.

AP.G.31 Ambrosia of Aztalan: A Targeted Paleobotanical Examination

Abraham Packard
Mentor: Joan Bunbury, Geography & Earth Science

Change in the concentration of environmental Ambrosia (ragweed) pollen has been used as a bioindicator of human activity and was examined for the area near the archaeological site of Aztalan, Wisconsin. As Ambrosia pollen concentration can be positively correlated with land clearance and disturbance such that an increase in pollen concentration indicates an increase in nearby land use by humans, the relative Ambrosia pollen concentrations over time indicate changes in land use by humans in the vicinity of the archaeological site of Aztalan. The largest increase in Ambrosia pollen should mark the beginning of land use by Euro-American settlers while there is an interesting potential to see change caused by the inhabitants of Aztalan, a site considered to be a satellite settlement of Cahokia, North America's largest single archaeological site and possibly only state-level society. This targeted paleobotanical pollen examination was made on a Mud Lake core (collected July 2019), three miles from Aztalan State Park and the corresponding archaeological site. The Mud Lake core samples were processed as per University of Ottawa LPC's Preparation of organic sediments for pollen analysis with hydrofluoric acid and acetolysis, mounted on slides, and pollen counts were taken in transects spaced 2 mm apart.

AP.G.32 Habitat Use, Thermal Distribution, and Diets of Brook Trout (*Salvelinus fontinalis*) as Affected by Interspecific Competition with Non-native Brown Trout (*Salmo trutta*) in the Driftless Region of Southwest Wisconsin

Kristina Pechacek
Co-authors: Eric Strauss, Jordan Weeks (Wisconsin DNR) and Kirk Olson (Wisconsin DNR)
Mentor: Eric Strauss, Biology

Brook Trout (*Salvelinus fontinalis*) and Brown Trout (*Salmo trutta*) are the two dominant salmonid species within the Driftless region of Wisconsin. Brook Trout and Brown Trout require cold, highly oxygenated water and are often found in stream headwaters. Brown Trout, a species introduced to the region in 1887, compete with Brook Trout due to similar habitat requirements. Brown Trout generally are the dominant competitor, but questions remain about how the two species interact in different habitats in the Driftless region. Therefore, the overall objective of the research project is to determine how interspecific competition affects Brook and Brown Trout thermal distribution, habitat use, and diet in

two Wisconsin Driftless region streams. This study will examine a treatment stream (Maple Dale Creek) with Brown Trout removal and a reference stream (Cook Creek) with no fish removal. Data collection will occur in southwestern Wisconsin Driftless region during the summer of 2019 and 2020 using the Before and After Control Impact Design (BACI). We expect the removal of Brown Trout will reduce competitive pressure on Brook Trout, resulting in a shift in habitat use, diet, and thermal distribution. Significant shifts from interspecific competition within the food web will be measured using stable isotope analysis before and after the removal of Brown Trout. This research will provide predictive responses for future Brown Trout removal projects. Bringing light to adverse impacts of interspecific competition from Brown Trout on streams with similar characteristics in the Driftless region of southwest Wisconsin.

AP.G.33 High Intensity - Low Frequency Inspiratory Muscle Training for Adults with Neuromuscular Disorders

Kelly Riesgraf and Haley Bock
Co-authors: Megan Siekert and Kristin Greany
Mentor: John Greany, Health Professions

Introduction/Purpose: Inspiratory muscle training (IMT) for the diaphragm and intercostal muscles can improve maximal inspiratory pressures (MIP) for those with neuromuscular disorders (NMD). The aim of this study was to determine if high intensity – low frequency IMT can improve MIP in individuals with NMD. **Subjects:** Thirty-eight individuals (71.3 ± 11 yrs.) were recruited from La Crosse, WI and randomized into two groups (17 intervention and 20 control). Diagnoses included multiple sclerosis (n=2), Parkinson's (n=25), cerebrovascular accident (n=10), and ataxia (n=1). **Methods:** MIP values (cm H₂O) were measured at baseline and 12 weeks. Subjects in the intervention group used an inspiratory muscle trainer set at 50% of baseline MIP and progressively increased. Sixty repetitions twice a week were completed in addition to the exercise program. ANOVA and t-tests (SPSS v26) were used to evaluate MIP changes. **Results:** MIP improved (6.8 + 10.1 cm H₂O) with training. The intervention group's pre-test mean was 63.5 + 23.5 cm H₂O and post-test mean was 72.8 + 21.4 cm H₂O; p=0.002. The control group's (n=20) pre-test mean was 60.9 + 18.0 cm H₂O and post-test mean was 59.9 + 17.5 cm H₂O; p>0.05. **Conclusion:** Current recommendations suggest daily low-intensity IMT to increase MIP. These results suggest that high-intensity low frequency IMT also improves MIP in individuals with NMD participating in exercise.

AP.G.34 Genomic Insights into Successional Patterns and Reproductive Strategies of Fire-associated Morchella

Annie Schauster
Co-authors: Todd Osmundson and Tom Volk
Mentors: Todd Osmundson, Biology; Tom Volk, Biology

Burn morels are found in montane, conifer forests in the NW United States in the years immediately following a fire. They are one of the earliest emerging organisms in fire-disturbed habitats, often occurring in very large numbers. While these mushrooms have economic and ecological importance, little is known about many aspects of their basic biology, including how many years they reproduce sexually after fires and the relative importance of sexual vs. asexual reproduction between fire events. To address their fruiting duration, in 2019 we collected 2nd year post fire specimens from sites where wildfires occurred in 2017 and burn morel species were collected in 2018. New specimens were identified using DNA sequencing to determine whether burn morels continue to reproduce or whether succession of non-fire-associated morel species predominate in the second-year post-fire. To address their reproductive styles, we surveyed 1st year post-fire sites and are using genomic data to reveal the spatial extent of genetic individuals in order to determine population genetic structure within and between sites. Preliminary results demonstrate a species shift from burn to non-burn morels in as early as the second year after a wildfire. Species distribution patterns in first-year wildfire sites suggest multiple genets are present, but genomic comparisons are still needed. Results from this research will create a better understanding of these commercially and ecologically important mushrooms.

AP.G.35 Running in the Wild 2020: Effect of Increasing Running Cadence of Force in an Outdoor Environment

Karissa Schewecke, Adrienne Tryan, and Drew Rutherford
Mentor: Drew Rutherford, Health Professions

High impact forces, occurring during foot strike, are one proposed mechanism for common injuries occurring in 56% of recreational runners. Previous studies found a low step rate (cadence) while running on a treadmill is associated with

higher impact forces. Therefore, increasing cadence while maintaining a consistent speed is an effective way to lower impact forces, thus reducing risk for injuries. Purpose: The purpose of this study was to examine effects of increased cadence on peak impact force in an outdoor setting to better simulate a natural running environment compared to a treadmill. It is hypothesized as cadence increases peak force will decrease. Methods: Peak force measurements were collected from 14 healthy recreational runners during two 2-mile outdoor runs. Peak force was measured using in-shoe pressure sensors during a baseline trial (participant-selected pace and cadence) and follow-up trial (set at 10% above baseline cadence with baseline pace). Pace and cadence were set and measured using a GPS watch and metronome. Results: Peak force within time and within runs will be analyzed using a repeated measures analysis of variance. Preliminary analysis suggests participants had good compliance with maintenance of pace while varying cadence from baseline to follow-up trials.

AP.G.36 Inspiratory Muscle Training in Adults with Neuromuscular Disorders: A Randomized Control Trial

Megan Siekert
Co-author: Kristin Greany
Mentor: John Greany, Health Professions

Introduction/Purpose: The aim of this study was to assess the effectiveness of inspiratory muscle training (IMT) on measures of strength and functional performance in individuals with neuromuscular disorders (NMD). Subjects: Thirty-seven community members (70.7 ± 11 yrs; 21 females; 16 males) were recruited from La Crosse, WI and randomized into two groups (18 intervention and 19 control). Methods: Maximum inspiratory pressure (MIP), 6 Minute Walk Test (6MWT), 5 Time Sit to Stand test (5STS), Timed Up and Go test (TUG), 10 meter walk test and Functional Gait Assessment (FGA) were measured at the beginning and end of a 12-week program. All subjects participated in biweekly supervised exercise with the experimental group also performing IMT (60 IMT repetitions twice a week). T-tests were used to evaluate within and between groups changes. Results: There were significant between group differences for the MIP, 5STS, and TUG outcome measures. MIP differences (within group) were only noted for the experimental group. Both groups demonstrated notable within group improvements for the 6MWT and FGA. Conclusion: Improvements in MIP and performance of functional tests were observed in people with NMD after a 12-week exercise program including IMT. The experimental group produced larger gains in MIP, 5STS, and TUG outcomes than the control group. IMT combined with exercise may be used to improve both MIP and performance of several functional outcome measures.

AP.G.37 The Effects of SK-03-92 Treatment on *Saccharomyces cerevisiae* Meiosis, Sporulation, and DNA Integrity

Aaron Simoni and Anne Galbraith
Mentor: Anne Galbraith, Biology

The global prevalence of fungal infections creates a significant burden on healthcare providers. While effective treatments exist, resistance to antifungals is increasing and the need for novel antifungal compounds becomes more important. A novel antimicrobial compound, SK-03-92, has been shown to effectively kill several groups of microbes, including Gram-positive bacteria and yeast. Results from an RNASeq analysis showed dysregulation of a number of genes in response to SK-03-92 treatment, including genes involved in meiosis and sporulation. The dysregulation of some of these genes was confirmed by qPCR, suggesting that the process of meiosis and sporulation is involved in the response of yeast cells to SK-03-92. In addition, SK-03-92 was shown to delay sporulation in treated yeast cells compared to wild-type cells. However, the spores produced appear to be as viable as wild-type cells. RNASeq analysis also showed that genes involved in the DNA damage response and oxidative stress were dysregulated. A TUNEL assay indicated that treated cells are positive for DNA damage. In addition, cells treated with SK-03-92 tested positive for increased levels of reactive oxygen species. Our findings provide additional insight into the mechanism of action for the novel antimicrobial compound, SK-03-92.

AP.G.38 Qualitative Application of the Theory of Planned Behavior to Alcohol Consumption in Undergraduates

Mariah Welke
Co-authors: Sarah Pember and Emily Whitney
Mentor: Sarah Pember, Health Education & Health Promotion

Background: Alcohol consumption is a concern in La Crosse County. Overall, 68% of college students in La Crosse reported drinking alcohol in the past month, with 16% of males and 6% of females reporting binge drinking during the past two weeks (Rooney, Herlitzke, & Kohlbeck, 2017). The purpose of this study was to investigate college students' alcohol-related beliefs, normative perceptions, intentions, and behavior. This information may support the development of more effective alcohol education programs on campus. Methods: Four focus groups were conducted with undergraduate students (n =16). The study population included students who identified as both regular consumers and non-consumers of alcohol. Audio recordings were transcribed verbatim, then coded and analyzed using thematic analysis (Braun & Clarke, 2006). Results: Themes emerged that included: the pressure of external demands, positive and negative influences, age-related perceptions, safety, cost, and self-control. Discussion & Recommendations: Findings indicate that alcohol education programs on college campuses should be less didactic and unrealistic, focusing instead on supporting skills for addressing the multidimensional nature of the decision to participate in risky drinking behaviors. These factors include perceptions of peer and societal norms, the desire to be included in college student life, and the ability to set healthy limits for alcohol consumption.

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

BP.G.32 Microplastic Abundance in the Water Column among Habitat Strata of the Upper Mississippi River

Courtney Baker
Co-author: Eric Strauss
Mentor: Eric Strauss, Biology

In 2019, microplastics were listed as one of the top 12 emerging threats to freshwater biodiversity. Microplastics are in the size range of 0.3-5.0 mm, allowing them to integrate into tissues once ingested. The presence of microplastics has been documented in several tributaries of Lake Michigan, raising the question of whether the same threat existed in the Upper Mississippi River (UMR). A possible source of these microplastics are wastewater treatment plants because the small particles are not filtered out of the treated effluent being released. This project aimed to quantify the abundance of microplastics in the surface waters upstream and downstream of where the La Crosse Wastewater Treatment Plant's effluent enters the UMR. Microplastics were found upstream and downstream of the plant and in the backwater samples as well, but no significant difference in concentration was found between all three sampling locations. Most of the microplastics were identified as fibers that likely originated from clothing. In addition, I will also be reporting on the findings of a pilot study examining surface water samples collected in September 2019 from three habitat strata of the UMR (main channel, side channel, and backwater). Confirmation of microplastics in the UMR raises concerns for aquatic organisms and demands that we continue to research this new threat.

BP.G.33 Running with a Higher Cadence Decreases Joint Loading and Increases Stride-to-Stride Loading Variability

Renee Dade, Anna Lowery, and Kimberly Ross
Co-author: Thomas "Gus" Almonroeder
Mentor: Thomas "Gus" Almonroeder, Health Professions

Background and Purpose: Runners frequently experience lower extremity overuse injuries. Adopting a higher cadence may reduce lower extremity joint loading and increase loading variability, which could be beneficial from an injury risk perspective. However, this has not been fully examined in previous literature. The purpose of this study is to investigate how cadence manipulation changes hip, knee, and ankle loading and stride-to-stride loading variability in female recreational runners. **Methods:** 14 uninjured female runners ran on an instrumented treadmill with 3-D motion capture at their preferred cadence, followed by a cadence increase of 7.5%. Joint loading was estimated via inverse dynamics. Paired samples t-tests were used to determine differences in peak lower extremity joint loading and stride-to-stride variability. **Results:** Joint loading decreased and stride-to-stride variability increased at both the ankle ($p \leq .01$) and knee joints ($p < .001$) when runners ran with a higher cadence. Increasing cadence did not affect hip loading ($p = .81$) or stride-to-stride variability in hip loading ($p = .58$). **Discussion:** Because both increased moment variability and decreased joint loading are associated with lower injury risk, clinicians may consider recommending an increase in cadence to lessen stress placed on the ankle and knee structures.

BP.G.34 School-Based Anxiety Interventions: Support Begins with the Adults

Katie Fischer
Co-author: Jocelyn Newton
Mentor: Jocelyn Newton, Psychology

The steps schools are taking to implement mental health interventions are valuable and encouraging. Still, schools must understand caregiver perspectives regarding school-based interventions, as youth rely on adult help to access services. This study will investigate how caregivers' perceptions of their adolescent's anxiety, along with socioeconomic status, impact acceptability of school-based anxiety interventions. Findings will address school psychologists' understanding of caregiver attitudes regarding interventions, therefore improving family-school consultation relationships and increasing student utilization of services.

BP.G.35 The Effects of Incremental Changes in Load Carriage on Lower Extremity Mechanics during Ruck Marching

Lauren Harding and Brooke Seubert
Co-author: Thomas “Gus” Almonroeder
Mentor: Thomas “Gus” Almonroeder, Health Professions

Background & Purpose: Many military recruits report injuries each year, partly due to the sudden increase in volume and intensity of load-bearing ruck marches. Background & Purpose: Many military recruits report injuries each year, partly due to the sudden increase in volume and intensity of load-bearing ruck marches. Increased load carriage is related to increased knee moments, but research hasn’t looked at subtle changes in loading. This study compared the effects of subtly different body borne loads on knee loading during marching. Methods: Eighteen Army ROTC cadets completed a ruck march on an instrumented treadmill with loads of 35 (light), 45 (moderate), and 55 lbs (heavy). During marching, kinematic data were recorded via a multi-camera system, and the instrumented treadmill recorded forces. Joint moments were calculated from the kinematic and force data using inverse dynamics. The peak knee extensor moments from the first half of stance were compared using a repeated measures ANOVA and post hoc tests. Results: There was a difference among the conditions for the peak knee extensor moments ($p < .001$). Knee extensor moments were greater for the moderate ($p = .003$) and heavy conditions ($p < .001$) vs. the light condition and greater for the heavy vs. the moderate condition ($p < .001$). Conclusion: Subtle changes of 10 lbs can make a difference on knee loading during ruck marching, potentially reducing knee injury risk.

BP.G.36 Brief Coping Cat: Intervention Effectiveness for Students and Anxiety

Ashley Haut
Co-author: Jocelyn Newton
Mentors: Jocelyn Newton, Psychology

Approximately one in five youth experience mental health disorders, with anxiety disorders being the most frequent in children (NAMI, 2019). The purpose of this study is to analyze the impact of the Brief Coping Cat intervention on students with varying levels of anxiety symptoms. This research will further support the role of school psychologists in advocating for and implementing mental health interventions in the school.

BP.G.38 Load Carriage Increases Leg Stiffness During Running

Waheed Momoh and Lauren Ehlinger
Mentor: Thomas “Gus” Almonroeder, Health Professions

Background & Purpose: Musculoskeletal injuries are common among military personnel, who are often required to carry body borne loads during military training. Load carriage may increase leg stiffness during running, which could increase injury risk. However, the effects of load carriage on leg stiffness is not fully understood. The purpose of this study was to determine whether differences in leg stiffness exist between unweighted and various body borne loaded conditions during running. Methods: Twenty ROTC cadets performed running trials with varying loads (unweighted, 35, 45, 55 lbs) in a randomized order. Cadets ran at their typical speed on an instrumented treadmill that recorded forces, while joint motion was captured via a multi-camera system. Leg stiffness (k) was calculated by dividing peak force by the pelvis center of mass displacement during early stance. Higher k values indicate heightened leg stiffness. Results: There was a difference in leg stiffness among the conditions ($p < .001$). Leg stiffness was greater for all loaded conditions vs. the unweighted condition ($p < .001$). Leg stiffness was also greater for the 45-lb and 55-lb conditions vs. the 35-lb condition ($p < .01$). Conclusion: Running with greater load increases leg stiffness, which may contribute to musculoskeletal injuries in military personnel.

BP.G.39 Professional Development: Effects of Mandated Training on Teachers’ Perceived Competency

Kayla Scheevel
Co-author: Robert Dixon
Mentor: Robert Dixon, Psychology

Teaching is an ever-changing profession with fluctuations in laws, policies, and even student demographics impacting daily instructional practices. It is widely accepted that professional development can promote improvements in teaching. The purpose of this study is to replicate the 2006 APA Teacher Needs Survey to evaluate teachers' perceived competence in four areas (i.e., classroom management, instruction, diversity and outreach) and compare perceptions between mandated professional development and a state that provides a lifetime license.

BP.G.40 The Impact of a Schoolwide Calming Space on Teacher Self-Efficacy

Jenna Sether

Co-author: Betty DeBoer

Mentor: Betty DeBoer, Psychology

Many students are exposed to trauma, impacting their ability to self-regulate. Teachers who do not feel equipped to manage challenging behaviors experience decreased teaching efficacy. In an effort to shift to trauma-informed practices, one school implemented a schoolwide calming space as a place for students to regulate their behavior. This study examines the effects of a schoolwide calming space on teachers' self-efficacy. Results will inform school psychologists of the impact of this positive behavior support.

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

CP.G.38 The Effects of Molded vs Metal Cleats across Playing Surfaces on Baseball Biomechanics

Cait Atchison and Brea Stanton
Co-author: Naoko Giblin
Mentor: Naoko Giblin, Exercise & Sport Science

Objective: Prior research shows that there seems to be differences in biomechanical movement patterns on different playing surfaces in many sports, but, little research has been done on the difference between baseball playing surfaces in conjunction with the different cleats utilized in the sport. The objective of the study is to investigate the biomechanical differences during functional movements (batting/drop step) based on type of cleat (metal/molded) and playing surface (turf/grass/sand). Methods: Twenty-three UWL baseball players completed 6 weeks of outdoor data collection during designated team practices. Data collection entailed video-recording the participants perform three trials of specific functional movements on each functional surface as well as in each set of cleats. Hip, knee and ankle joints in different planes were recorded and analyzed, in order to determine which combination of cleats and surface may possibly be the safest. The type of cleat each participant wore was randomized: half the participants were in metal cleats the first three weeks, while the other half were in molded, and then they switched the last three weeks. Data collected was analyzed for any significant findings. Results: There were significant differences between the surfaces, cleats, and cleat-surface interactions on varying joints analyzed within the study. The main significant differences were dependent on the surface types.

CP.G.39 Purification & Characterization of *Staphylococcus aureus* Protein BrpR

Xavier Brandon
Mentors: William Schwan, Microbiology; Daniel Grilley, Chemistry & Biochemistry

The bacterial species *Staphylococcus aureus* causes diseases in humans that range from skin and soft tissue infections to bloodstream and heart valve infections. During tissue-based infections, *S. aureus* will form biofilms within the body of the patient, which shield the bacterial cells from both the immune system and most antibiotics. Because of this, understanding how *S. aureus* cells regulate biofilm production is crucial to the development of new anti-staphylococcal drugs. During previous work by the Schwan lab, it was discovered that treatment with the novel antibiotic SK-03-92 caused transcription of a key biofilm production gene, *srtA*, to become dysregulated in *S. aureus* cells. Dysregulation of *srtA* was found to be correlated with the dysregulation of two as of yet uncharacterized genes named *brpS* (biofilm regulator protein sensor) and *brpR* (biofilm regulator protein response). We hypothesize that BrpS/R are components of a novel two-component regulatory system, which controls expression of *srtA* and, by extension, biofilm production in *S. aureus*. To strengthen this hypothesis, we will use histidine-tag purification to isolate BrpR. BrpR's sequence suggests it is a DNA-binding protein; so, we will confirm its hypothesized structure with circular dichroism spectrography and determine its binding affinity to the promoter region of *srtA* via electrophoretic mobility shift assay.

CP.G.40 Professional Development: The Key Ingredient to Mental Health Literacy

Courtney Lloyd
Co-author: Robert Dixon
Mentor: Robert Dixon, Psychology

One in five youth live with a mental health condition, however, teachers have limited mental health literacy. We will provide results of a study that show how state requirements for professional development impact the mental health literacy of teachers. Practitioners will learn how to appraise their state's professional development requirement in order to formulate a plan for their school in order to increase mental health literacy and improve student academic, behavior and mental outcomes. At the end of the session, participants will be able to describe the impacts of mental health on the school system. At the end of the session, participants will be able to distinguish patterns of mental health literacy based on professional development requirement. At the end of the session participants will be able to develop a plan to address the needs of their school based on their state's professional development requirements.

CP.G.41 Are You an Ally? School Psychologists Support of LGBTQ+ Students

Bobbi Jo Loomis
Co-author: Robert Dixon
Mentor: Robert Dixon, Psychology

All students should have a sense of belonging and acceptance in schools; which is not necessarily the case for students of the LGBTQ+ community today. A supportive adult, or ally, can make all the difference for these students. The present study assesses school psychologist's degree of being an ally to this population and how it might vary in different communities. Implications for advocacy and further professional development for school psychologists will be discussed.

CP.G.42 Autoregulation of the NmpR Two-component System in *Myxococcus xanthus*

Colin McAllister
Mentor: Dan Bretl, Microbiology

Myxococcus xanthus is a soil bacterium that has several complex social behaviors. *M. xanthus* utilizes a high number of two-component systems (TCS) to regulate these behaviors. TCS are utilized by bacteria to respond to stimuli and consist of two proteins: a Histidine Kinase (HK) that recognizes a stimulus and a cognate response regulator (RR) that is phosphorylated by an active HK. The RR then interacts with other proteins or directly with DNA to regulate transcription. *M. xanthus* motility is regulated by at least three TCS. This includes the Nmp TCS which plays a role in modulating the expression of genes important for motility. The stimulus of the Nmp TCS and how NmpR (a RR) binds DNA is the focus of our research. To investigate autoregulation of the NmpR promoter, lacZ reporter fusions were constructed, transformed into various mutants, and LacZ activity measured. Our research showed that changes to the NmpR binding sites decreased LacZ activity even in strains in which NmpR is active. Additionally, the wild-type *M. xanthus* strain doesn't show significant expression under normal conditions. Overall, these results are important in defining important sites in autoregulation of the Nmp system and will further understanding of RR regulation.

CP.G.43 SK-03-92 Treatment of *Saccharomyces cerevisiae* Affects Cell Cycle Progression

Nathan Milanowski
Mentor: Anna Galbraith, Biology

With the growing incidence of resistant microbial strains of bacteria and fungi, research into novel drugs and mechanisms for fighting resistant strains is an integral step in combating this resistance. The promising antimicrobial compound SK-03-92 has been developed and studied at the UWL spanning the Microbiology, Biology, and Chemistry departments in an effort to understand the mechanism behind its effectiveness. Our lab has been looking at various aspects of how SK-03-92 affects the model system *Saccharomyces cerevisiae* (Baker's yeast) which will likely lead to a more solid understanding of how the antimicrobial kills microbes. A large-scale RNA-seq analysis was previously done to determine which transcripts in the Baker's yeast's genome are dysregulated by SK-03-92. Significant dysregulation was found in transcripts related to cyclins involved in cell cycle regulation. With this information, we have further analyzed cyclin transcripts over various time points after SK-03-92 treatment using qPCR and examined possible differences in general protein levels using SDS-PAGE. Observations from the SDS-PAGE have illuminated the possibility of the formation of protein aggregation in SK-03-92 treated cells. Thioflavin S and Proteostat stains were used to confirm protein aggregation in the cells using fluorescence microscopy. In light of these results, we have developed a model for how the SK-03-92 compound may affect yeast cells.

CP.G.44 Effects of Aerobic Exercise Following Motor Learning on Skill Retention in Males

Jessica Treuthardt, Jared Buntin, Alexander Carpenter, Neil Corrigan, Danielle McIntosh, Nicholas Peters, and Alyssa Rotzenberg
Co-author: Patrick Grabowski
Mentor: Patrick Grabowski, Health Professions

Introduction: Aerobic exercise (AE) enhances cognitive and motor learning. This effect has been found in females performing motor tasks including a drop landing with a vertical jump (DVJ) but has not been studied in males. Purpose: To determine if AE enhances DVJ motor learning in males. Methods: 30 males (mean age: 22.1, range: 19-30) attended a 1-hour session, performing 2 DVJs at baseline. Peak vertical ground reaction forces (PVGRF) and hip flexion angles (HFA) at the deepest point of landing were measured with a force plate and 2D motion capture software. Next, they performed 30 DVJs with feedback for enhanced landing mechanics. Participants were then randomized to a group performing 20 minutes of cycling at 55-65% heart rate reserve with 5 minutes for warm-up and cool down (Ex; n=16), or 30 minutes of sham electrical stimulation, control (C, n=14). After 1 week, retention was measured using PVGRF and HFA during 2 DVJs. Results: Baseline performance did not differ between groups (mean HFA angles: C= 88.0 (23.4), Ex: 85.5 (17.1), $p>.05$). Both groups increased HFA after training (C: mean HF angle = 114.7, (15.9), Ex: 111.9 (8.1), $p<.01$). At retention, Ex had more retainers (Relative retention: 2.2 (95%CI 0.9 to 5.4)). PVGRF results demonstrate the same pattern. Conclusion: Males who participate in AE after motor learning may be twice as likely to retain the trained skill compared to males who do not complete AE

CP.G.45 Identifying Pollen Using DNA Barcoding to Determine the Pollinator Network of Plasterer Bees

Dakota Villers

Mentor: Barrett Klein, Biology

There are many terrestrial plants, including crops such as apples and almonds, that require assistance from pollinators to reproduce. Outside of agricultural systems, approximately 80-95% of the plant species found in natural habitats require animal-mediated pollination (Ollerton et al., 2011). When obtaining nectar from a flower after subsequently visiting a different flower, there is a chance that the pollinator will deposit pollen onto the current flower. This deposit of pollen leads to the fertilization of the flower, and the flower can then produce seeds that can develop into new plants once they become deposited in the soil. Pollinator networks are used to understand the mutualistic interactions between plants and their associated pollinators, and they can be used to study how changes in the populations of either the species of plant or their associated pollinator affects each other (Valdovinos et al., 2016). These networks, however, are threatened by global pollinator declines and local extinctions of plant species and biotic invasions, making it critically important to understand the mechanisms that drive network stability (Valdovinos et al, 2016). Plasterer bees, which belong to the family Colletidae, are solitary and live underground for most of the year and will emerge from the ground each spring to reproduce and collect pollen. In April and May, I will be collecting pollen from plasterer bees found on the University of Wisconsin-La Crosse campus to determine what plants the bees are pollinating. We will collect pollen from 110 plasterer bees between two aggregation sites (55 per site). Five samples from each aggregation site will be saved for morphological identification using microscopy, and the other 100 samples will be analyzed using DNA barcoding using Nanopore Sequencing to determine what plants they are pollinating. The objective of my proposal is to determine if there is a difference in the plant diversity of the plants among the different aggregations of plasterer bees based on different blooming times of the year.

CP.G.49 The Comparison between Arterial Stiffness, Metabolic, Body Composition and Performance in UW-La Crosse Students to the Literature

Lao Lee

Co-authors: Ward Dobbs, John Porcari, and Salvador Jamie

Mentor: Salvador Jamie, Exercise & Sport Science; John Porcari, Exercise & Sport Science

Purpose: Past studies have shown that arterial stiffness can predict cardiovascular mortality and morbidity. Being able to detect these early findings can initiate early interventions to improve health. The aim of this study is to compare the arterial stiffness (pulse wave velocity, PWV), glucose and lipid profile, body composition and physical performance in students from University of Wisconsin - La Crosse to their aged-matched counterparts. By comparing this sample size to the literature, we can have a better understanding of how a subset student population in South Western Wisconsin compare to their peers. This can elucidate strengths and weaknesses in this specific population. Methods: Twenty-four healthy, male and female subjects, aged 18-30 were tested following a Physical Activity Index questionnaire. Vascular, lipid, and physical performance (aerobic and strength) indices were measured. These data will be compared to the literature. Results & Conclusion: At this time, we are still comparing the data to the literature.

DP.G.27 Differences in Ground Reaction Force and Movement Patterns during Competition among Female Collegiate Volleyball Players

Emily Anderson and Stephanie Dietrich

Co-authors: Renee Dade, Drew Rutherford, Becky Heinert (Gunderson Health System), and Thomas Kernozek
Mentors: Thomas Kernozek, Health Professions; Drew Rutherford, Health Professions

Based on laboratory settings, poor jumping and landing mechanics with high impact forces have been implicated to injuries in volleyball players; however, few studies have investigated impact forces during game-play. The purpose of this study was to investigate jumping landing movement patterns and vertical ground reaction force (vGRF) among volleyball players during competition. 11 female collegiate volleyball players were tested during a single match. Play was recorded via high speed video and vGRF was measured via insole sensors. 157 jumps during 25.26 person-minutes-of-play were analyzed. The majority of jump landing events were bilateral (n=100), were asymmetrical (25% asymmetry in loading) and had a median jump-height of 0.25 meters (m). Bilateral events were then analyzed for peak vGRF (L=1.90 BW, R=2.09 BW) and loading rate (L=26 BW/sec, R=28 BW/sec). The majority of unilateral events (n=57) resulted in left landings (n=38) with peak vGRF of 3.71 BW, jump-height of 0.28 m, and loading rate of 84 BW/sec. Right unilateral events showed peak vGRF of 2.48 BW, jump-height of 0.07 m, and loading rate of 30 BW/sec. These descriptive provide insight to athletes and coaching staff regarding in-situ jump landings; this understanding may reduce the risk of injury in volleyball players.

DP.G.28 The Effects of a Dual Task on Lower Extremity Mechanics during a Single Leg Jump Landing in College-Aged Females

Ashley Baugher, Bryce Jenson, and Morgan Glodowski

Mentors: Thomas Kernozek, Health Professions; Drew Rutherford, Health Professions

Females have an increased risk for anterior cruciate ligament (ACL) injuries during non-contact sport movements such as landing. Our purpose was to determine the effects of a cognitive dual task on lower extremity jump landing mechanics. Thirty-three college-aged females participated. Each performed ten single leg jumps at 75% of their maximum horizontal jump for each of three conditions: control without dual-task, dual-task involving digit calculations, and dual-task counting dots. Motion analysis and force platform data were captured and used in a musculoskeletal model to estimate muscle and joint forces. These data were used in a joint specific model to estimate knee kinetics. Knee joint and ACL forces were compared using a three-way repeated measures ANOVA. Forces were higher with digits dual-task when compared to the control for femur/tibia compressive force (9.87 ± 1.41 vs. 9.70 ± 1.41 BW, $p=0.018$), femur/tibia shear force (1.46 ± 0.21 vs. 1.43 ± 0.21 BW, $p=0.018$), and ACL shear force (1.71 ± 0.25 and 1.68 ± 0.23 BW, $p=.014$). Effects sizes were 0.12, 0.02, and 0.12, respectively. Knee joint and ACL shear force were greater with digit-based dual-task. Digits dual-task appears to effect jump landing mechanics in college-aged females more than counting dots or the control. Keywords: ACL, knee, force, compressive, shear

DP.G.29 Social Contact, Social Distancing, and Attitudes Towards LGBTQ+ Individuals: A Study of Differences in College Students in the University of Wisconsin Educational Systems

Karina Billings, Ingrid Van Duyne, and Cali Ogurek

Mentor: Ingrid Van Duyne, Health Professions

The number of people who identify as lesbian, gay, bisexual, transgender, and queer (LGBTQ) is rising. Despite this, prejudice and discrimination remain high. In modern US society, attitudes towards the LGBTQ+ community are widely spread and typically vary based on factors such as gender, religious views, and where a person was raised. The negative effects of these attitudes toward the LGBTQ+ population cannot be denied. This study was the result of a call to develop a greater understanding for more research to explore contact-prejudiced patterns found in collegiate samples as well as perceived discrimination felt by people who identify as transgender. Worthen's (2012) Attitudes Towards LGT People research method was used to assess data from the university's undergraduate and graduate LGBTQ+ student body. The five hypotheses developed in this study were used as a baseline to determine social contact and social

distancing towards people who identify as LGBTQ+. Additionally, the Trans Discrimination Scale developed by Watson et al. (2019) was used to determine the perceptions of discrimination felt by people who are transgender enrolled at a University of Wisconsin system school. Results to come. These findings can be used to encourage universities in Wisconsin (and possibly across the United States) to foster contacts and relationships among all students regardless of sexual orientation with the hopes of seeing an increase in positive attitudes towards the LGBTQ+ community.

DP.G.30 Response of Elm (*Ulmus spp.*) and Ragweed (*Ambrosia spp.*) Densities to Human Intervention

Emilie Clavette

Mentor: Joan Bunbury, Geography & Earth Science

Human modification of the landscape leads to changes in the structure of plant communities, as well as changes in individual populations. Two prevalent examples of this process are the rise of *Ambrosia spp.* that is associated with land clearance and the decreasing density of host species after the introduction of invasive pests, such as changes in *Ulmus spp.* densities in response to Dutch Elm Disease. These changing densities can be identified in paleoecological records by analyzing pollen samples from lake sediment cores. In January 2014, sediment cores were collected from Mud Lake in Jefferson County, Wisconsin and processed for pollen. The sediment cores are currently being analyzed for *Ambrosia spp.* and *Ulmus spp.* to test for changes in concentration after human interventions. From 1000 to 1250 CE, Mississippian people settled in Aztalan. We expect to see an increase in *Ambrosia spp.* after 1000 CE related to land clearance. More recently, Dutch Elm Disease was introduced to Wisconsin in the 1960s. Due to elm being targeted by the pathogen shortly after they are reproductively mature, we expect to see lower concentrations of *Ulmus spp.* after the 1960s.

DP.G.32 Effect of Ankle Cryotherapy on Triple Forward Hop Performance in Healthy College-Aged Participants

Mykala Konradry, Jeremiah Christman, Michael Conway, Jordan Lundberg, Nicholas Vollmer, and Drew Rutherford

Mentor: Drew Rutherford, Health Professions

Background: Ankle sprains are one of the most common injuries that occur during sports participation resulting in proprioceptive changes that can lead to subsequent ankle sprains. The triple forward hop test is a common functional test used to assess readiness to return to sport following lower extremity injury. This test may not be an accurate representation of proprioceptive recovery, leading to athletes returning to sport participation too early. Purpose: The purpose of this study is to determine if triple forward hop test performance is affected by impaired ankle proprioception simulated with cryotherapy. Methods: This study used a repeated measures design. 25 healthy college-aged participants were included in this study. Participants performed a series of triple forward hops before and after 15 minutes of ankle cryotherapy applied by a Game Ready device (combined cryotherapy and compression cuff). Ground reaction force plates and a 15 camera 3-D motion capture system collected landing mechanics data including peak joint flexion and extension moments at the ankle, knee, and hip. Results: Preliminary results showed that the total forward triple hop distance did not decrease with cryotherapy. Future efforts will characterize coordination differences between joint angle and moment patterns.

DP.G.33 Mindfulness and Our Youth: Examining Differences among Gender and Trauma

Theresa Maurer

Co-author: Robert Dixon

Mentor: Robert Dixon, Psychology

Mental health disorders are the most common health issues faced by our nation's school-aged children. Mindfulness has been identified as an effective intervention for improving overall well-being in adults, and research suggests similar benefits for youth. The purpose of this study is to analyze the impact of a six-week mindfulness intervention on gender and adverse childhood experiences (ACE) scores. This research will further support school psychologists' role in supporting student mental health.

DP.G.34 Influence of Flooding and Gap Size on the Fate of UMRS Floodplain Forest Canopy Gaps

Alexandra Oines

Co-authors: Meredith Thomsen and Andrew Meier (US Army Corps of Engineers-St. Paul District)

Mentor: Meredith Thomsen, Biology

Canopy gaps often serve as locations for new tree seedlings to grow. However, adverse environmental conditions (e.g. altered flood regimes, invasive species) may inhibit typical successional patterns and prevent canopy gaps from closing. New plant community types may then become established, which leads to a loss of forest cover over time. The Upper Mississippi River System (UMRS) floodplain forest is showing trends of insufficient natural regeneration. We aimed to determine how the factors of gap size and growing season flood dynamics interact to influence the fate of canopy gaps. We used a spatial dataset developed by collaborators at USGS that identified canopy gaps in the UMRS using LIDAR imagery and were able to sample a total of 20 gaps representing a range of gap sizes and flood conditions. Preliminary analyses have not found statistically significant connections between tree seedling presence and gap size x flood interactions. However, across all surveyed gaps, presence of tree seedlings < 50 cm tall declined as presence of reed canary grass increased. Tree seedlings showed a higher percent cover in the surrounding forest than within the gap interior, suggesting that propagule supply may be an important factor in successful regeneration. Through further analyses and future sampling, we hope to gain increased understanding of drivers of forest regeneration success or failure within the UMRS floodplain forest to support forest management efforts.

DP.G.35 Investigating the Genetic Basis of Resilience to Iron Starvation Using *Chlamydomonas*

Sarah Rand

Co-author: Tony Sanderfoot

Mentor: Tony Sanderfoot, Biology

The world is constantly changing. The means to be able to cope with changes to survive and reproduce have been demonstrated for many years through evolution. Organisms must adapt to changes to survive and reproduce. Resilience is the ability to recover from a stress by an organism before having to compensate or adapt for survival. There are three main types of resilience: environmental, psychological and biological (the main focus in this study). Biological resilience is the ability to recover from a stress at a cellular level, making *Chlamydomonas* (*Chlamy*) a unicellular green alga, a model organism to study resilience. Resilience was studied by limiting the availability of an essential nutrient iron, causing stress to *Chlamy*. Specifically, a screening method was developed to study the growth rate of wild type and mutated *Chlamy* under normal and stressed conditions. This allows for a more focused understanding of the genes involved in resilience.

DP.G.36 In Vitro Effects of Cold-storage on Human and 13-lined Ground Squirrel Platelet Apoptosis

Noah Splinter, Claire White, Katie Krien, and Sarah Lairson

Mentor: Scott Cooper, Biology

Human platelets have numerous uses in healthcare settings including their administration to individuals with thrombocytopenia and patients undergoing chemotherapy. Their storage time is limited at room-temperature due to bacterial contamination, while the potential for cold-storage remains to be unseen as platelets stored at 4oC are rapidly cleared from circulation following transfusion by an unknown mechanism. The platelets of the 13-lined ground squirrels remain in circulation following periods of time when their body temperature drops to temperatures near 4oC, making this organism a novel animal model in this research. To investigate the potential role of apoptosis, programmed cell death, in the rapid clearance from circulation following cold-storage, human and ground squirrel platelets will be stored at room temperature and at 4oC for 0-5 days before being treated with ABT-737 and analyzed by flow cytometry to determine the number of cells undergoing apoptosis. Platelet lysates will be isolated and examined by immunoblot to look at protein levels of numerous apoptotic markers. This data will provide further insight into the potential role of apoptosis in platelet clearance from circulation following cold storage.

DP.G.37 Offloading Effects on Impact Forces and Patellofemoral Joint Loading during Running in Females

Austin Swigart and TJ Campbell

Co-authors: Renee Dade, Stephanie Dietrich, Drew Rutherford, Thomas “Gus” Almonroeder, and Thomas Kernozeck

Mentors: Thomas Kernozeck, Health Professions; Drew Rutherford, Health Professions

Patellofemoral joint pain is a common running-related injury, especially in females. Use of bodyweight support has the potential to reduce loading on the patellofemoral joint during running to augment rehabilitation efforts. Our purpose was to examine differences in patellofemoral joint loading as bodyweight is offloaded in female participants during running. Twenty-eight healthy females free from lower extremity injury were tested. After a habituation period, participants completed four running trials on an instrumented treadmill with varying amounts of bodyweight offloading using a commercially available system that partially supports a runner using elastic cords affixed to a frame and attached to the pelvis and legs via a harness. Kinematic data from a 3D motion capture system and kinetic data from the treadmill were combined in a computer model to estimate patellofemoral joint stress. Peak impact force and patellofemoral joint loading were reduced as the amount of stretch in the elastic band system increased. The greatest amount of stretch reduced peak impact forces ~12% which reduced patellofemoral joint stress by ~25%. The use of bodyweight support appears effective in reducing impact and patellofemoral joint loading. This may augment rehabilitation efforts in the treatment of patellofemoral joint pain in running.

DP.G.38 Effects of Regional Vibration Training on Lower Extremity Power in Healthy Young Adults

Carly Volp and Trace Von Bruenchenhein

Mentor: Steni Sackiriyas, Health Professions

Objective: Previous research has administered vibration while participants statically stand or perform exercises in standing. Research studies have not examined the effects of seated vibration on power. The purpose of this study was to determine the effects of a seated leg press vibration on lower extremity power. It was hypothesized that seated vibration would increase lower extremity power. Methods: Sixteen students (10F, 24.8 ±3.0 years) received ten minutes of vibration to their feet while performing leg press in a seated position twice a week, for four weeks. Lower extremity power was assessed through countermovement jump height and was measured at baseline and 24 hours after the final intervention. A paired sample t-test was used to analyze the data. Results: Average lower extremity power significantly increased from 118.14 W (SD 26.65) to 120.81 W (SD 26.61) ($p=0.011$, $d=0.10$) over time. Conclusion: The statistically significant difference of 2.67 W supports the hypothesis. The small effect size, however, suggests this difference may not be clinically significant in young adults. Further research is required to investigate the effects of regional vibration on at-risk populations experiencing LE power deficits.

GRADUATE ORAL PRESENTATION ABSTRACTS

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

AO.G.40 13-lined Ground Squirrel Platelets Exhibit Rod Conformation that Reduces Rates of Liver Cell Phagocytosis

Austin Mancosky
Mentor: Scott Cooper, Biology

Thrombocytopenia, or low platelet levels in blood, is a symptom of various conditions and is typically treated via platelet transfusions. Donated platelets must be stored at room temperature due to structural damages when chilled, which leads to rapid clearance via liver cells and macrophages post-transfusion. Storage at room temperature leads to a 5-day shelf life, susceptibility to microbial contamination, and limits supply. Hibernating mammals like 13-lined ground squirrels (*Ictidomys tridecemlineatus*) have platelets that are resistant to cold storage lesions and may reduce phagocytosis. Human and ground squirrel platelets were stored in cold and room temperature, exposed to receptor-glycan-specific enzymes, fluorescently labeled, incubated with HepG2 cells, and HepG2 fluorescence was measured via flow cytometry. Long-term-cold-stored ground squirrel platelets were taken up by HepG2 cells at a significantly slower rate than both control ground squirrel platelets and taxol-treated human platelets ($P < 0.01$). Subsequent platelet glycosylation experiments using a FITC-labeled lectin (RCA I) showed that terminal sialic acid residues of ground squirrel platelets remained intact ($P > 0.10$) while sialic acid was lost in human platelets after cold storage ($P < 0.01$). Further sequestration and platelet receptor clustering experiments should be performed to better understand how ground squirrel platelets withstand repeated temperature cycles without rapid clearance post-transfusion

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

BO.G.37 Development of Antiviral Edible Films against Tulane Virus, a Human Norovirus Surrogate, in Selected Food Products

Michelle Malysa
Co-author: Xinhui Li
Mentor: Xinhui Li, Microbiology

Foodborne illnesses are an important public health issue and there are millions of cases a year in the United States. Human noroviruses are the leading cause of foodborne outbreaks and illnesses and are commonly transmitted via fecal-oral route. Common food products associated with human norovirus include shellfish, produce, and fruits. As there is no convenient cell culture system or small animal model to cultivate human noroviruses, most related studies rely on cultivable surrogates, such as murine norovirus and Tulane virus. Interest in antimicrobial edible films has been increasing as they can be coated on food products to control various foodborne bacterial pathogens. However, studies of using antimicrobial edible films to control foodborne viruses in food products are still very limited. The goal of this research is to develop antimicrobial films with antiviral properties to control the Tulane virus in selected food products. The antiviral properties of the edible films against Tulane virus will first be assessed by exposing the virus directly to the films. The films that exhibit antiviral properties will then be tested for the effectiveness in controlling Tulane virus in food products. As food contamination begins at the surface of many food products, the development of antiviral edible films can potentially be applied in the food industry to help prevent the spread of foodborne illness caused by human noroviruses.

BO.G.44 RoloBox: An Image-Aware Mobile Application using the AWS Ecosystem

Hui Li
Co-author: Kenny Hunt
Mentor: Kenny Hunt, Computer Science

Several popular web applications and mobile apps support a feature that scans through a user's photo album and generates a gallery of individual faces. Photos with similar faces are grouped together, but information about the people appearing in the photos is not typically made available. RoloBox is an App that allows users to manage a list of contacts while supporting a photo-based matching feature so that users can upload images of their contacts and, more importantly, identify those contacts at a later time by taking a photo. RoloBox utilizes the Rekognition APIs provided by Amazon Web Services (AWS) to detect and store facial features. Once a person is labeled with contact information in a photo, they will be recognized and automatically labeled when appearing in another photo. The paper presents the design and partial implementation of RoloBox with an emphasis on how AWS Rekognition and S3 services provide foundational support.

BO.G.46 Hypothalamic Control of Feeding Transitions in the Thirteen-lined Ground Squirrel (*Ictidomys tridemcclineatus*)

Khia Yang

Mentor: Christine Schwartz, Biology

The thirteen-lined ground squirrel (*Ictidomys tridemcclineatus*) undergoes natural and extreme changes in feeding behavior, including a six-month fast during hibernation, which occurs over winter. In the spring and summer, ground squirrels increase food intake for fat storage to use for energy during hibernation. In late fall, prior to hibernation, they decrease food intake and become hypophagic, which we have verified in the lab. Previous work investigated mRNA expression in the hypothalamus during the fall feeding transition in the ground squirrel, but showed no change in expression of specific targets that are important for human health, including neuropeptide Y (NPY) and orexin A, which promote feeding, and pro-opiomelanocortin (POMC) and serotonin receptor subtype 2c (HTR2C), which promote satiety and reduced appetite (Schwartz et al 2015). However, protein expression of these targets during the fall transition is not known and will be determined using immunohistochemistry. We expect to see increased expression of NPY and orexin A during hyperphagia and increased expression of POMC and HTR2C during hypophagia.

GRADUATE EXHIBIT PRESENTATION ABSTRACTS

Exhibit Session D
12:05 pm – 1:00 pm

DE.G.100 Evolution of Summated Hazard Score Versus Starting Strategy

Sylvia Binkley

Mentors: Carl Foster, Exercise & Sport Science; Salvador Jamie, Exercise & Sport Science

PURPOSE: During competitive events, pacing strategies are dependent upon how an athlete feels at a specific moment and the distance of the race remaining, the Hazard Score (HS). HS has been shown to provide a measure of how likely an individual is to increase or decrease their power output (PO) at any point during an event. The purpose of this research was to manipulate different starting strategies in order to establish whether the summated HS, as opposed to the momentary HS, will improve prediction of performance during a middle-distance cycling simulated competition. **METHODS:** Seven subjects performed two practice 10-kilometer cycling time trials (TT) followed by three, 10-kilometer time trials with imposed starting (first 3-km) PO ($\pm 5\%$ of mean PO during second practice trial and self-paced). **RESULTS** TT time for fast, self-paced and slow starts varied (xxxxxx), but mean PO was similar (xxxxxxW). The evolution of HS reflected the imposed starting strategy, with a reduction in PO following a fast- start, increased PO following a slow-start with similar HS during the last part of all TT. **CONCLUSION:** The summated HS was higher with a fast start, indicating greater overall effort, with limited time advantage. We would like to submit this abstract as a work in progress. All data should be complete by April

DE.G.101 The Effects of a Proper Cool Down on Potential Detriments from the High-Intensity Resistance Sessions

Elizabeth Schwab

Co-authors: Nicholas M. Beltz (UW-Eau Claire), Ward Dobbs, Carl Foster, and Salvador Jamie

Mentor: Salvador Jamie, Exercise & Sport Science

Purpose: High-intensity resistance exercise (HIRE) is effective to improve muscular function, however its effects on arterial stiffness (pulse wave velocity, PWV) have been controversial. Therefore, the purpose of this study is to examine the effects of common cool down protocols on vascular function following a bout of HIRE. **Methods:** Eight (n=8) recreationally active males completed four different trials following two sessions of familiarization. Participants were measured for body composition, blood pressure (BP) in the brachial and aortic arteries, arterial stiffness parameters, and one-repetition maximum (1RM). After each exercise session, vascular changes were measured for 60 minutes. An analysis of variance with repeated measures was used to determine differences within and between interventions at baseline, immediate post, and in the subsequent timepoints. **Results:** Systolic BP immediately following aerobic training were not significantly different between the cooldown and non-cooldown protocols ($p > 0.05$). PWV was significantly lower in the sprint interval compared to the other two ($p < 0.05$). **Conclusion:** As expected, HIRE elicited a significant detriment to vascular function. Although BP returned to baseline levels relatively quickly following HIRE, regardless of cooldown, arterial stiffness remained elevated. Sprint intervals following HIRE seems to reduce the PWV responses following HIRE, which may highlight its practical use to attenuate arterial stiffening.

FACULTY & STAFF ABSTRACTS

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

AP.F.39 Creative Solutions to Online Experimental Archaeology in ANT / ARC 346

Heather Walder, Signe Aspengren, Josh Courtney, Cody Dobson, Emily Kinney and Lauren Stanley
Co-authors: Zach Bush, Connor Kleinschmidt, Miles Martinez, Teddy Oprzedek, Tim Rasmussen, Maddie Rogin, Brett Sander, Cal Sebranek, and Erin Spierings
Archaeology & Anthropology

Students in the Spring 2020 Ethnoarchaeology and Experimental Archaeology course (ANT/ARC 346) at UW – La Crosse conducted a semester-long experiment investigating how stone tools may have been made and used at archaeological sites where quartz was the primary raw material available for flintknapping. By replicating past human behaviors using quartz flake tools, it is possible to identify diagnostic wear patterns visible at the macroscopic and microscopic scale. Such use wear patterns can then be compared to artifacts from archaeological sites, such as an Archaic through Late Woodland (5000 – 1000 BP) lakeshore occupation in Red Cliff, Wisconsin being investigated in Summer 2020 in collaboration with the Red Cliff Band of Lake Superior Chippewa. Students produced stone tools from quartz beach cobbles collected in northern Wisconsin, using the bipolar percussion method followed by hard hammer and soft hammer reduction with stone, antler, and copper hammers and striking tools. Students used these tools to scrape and cut dry animal hides, scrape and whittle wood, butcher and process meat, work fresh bone, and produce antler tools. Results will be useful in interpreting the possible uses of archaeological artifacts that may have similar abrasions and microwear as those identifiable on the experimental lithic tools produced in this study.

FACULTY AND STAFF ORAL PRESENTATION ABSTRACTS

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

AO.F.41 Societal & Performance Implications of Multinational Corporations' Human Rights Violations

Christine Ascencio

Co-authors: Nitish Singh (Saint Louis University) and Hadi Alhorr (Saint Louis University)

Management

Multinational corporations (MNCs) frequently violate the human rights of individuals across the world as a result of their activities, directly and indirectly, through cooperation with local governments. Unfortunately, the international business literature has not yet addressed these issues. In this paper we develop a framework for identifying and assessing violations committed by MNCs in the dimensions of abuse, development, environment, health, and labor. After testing the validity and reliability of the framework, we use it to assess reported human rights violations by 91 MNCs in the extractives, apparel, and agricultural products industries, between 2007-2017. Our findings highlight violations related to all dimensions, across industries and geographies, and with an alarming number of cases related to abuse. We also find the extractives sector to be particularly liable to all dimensions of violations, and that North American and Western European companies persistently violate the human rights of people in less-developed countries. These findings have important implications for MNCs, policy makers, and academics alike. They help us to understand both the social impact of international business activities on communities around the world, as well as identifying the potential economic repercussions that could result from such violations.

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

BO.F.47 I Am This Widow: Social Support in Friendship after the Loss of a Spouse in Mid-Life

Dena Huisman

Co-author: Allison Lemke (UW-Milwaukee)

Communication Studies

This project elaborates on relational processes of social support after the loss of a spouse in mid-life. It extends knowledge in effective support by examining themes of friendship communication between widow(er)s and their friends rather than widows' individual perceptions, which is the focus of past research. Findings indicate that when social support is constructed between individuals with a focus on the specific relationship, support is highly valued. General support that does not consider the individual or relationship between widow and other is seen as unhelpful. It concludes by suggesting future research on social support take a dyadic approach.

**2019
RECIPIENTS OF
STUDENT
RESEARCH
GRANTS**

**2019 RECIPIENTS OF
UNDERGRADUATE RESEARCH AND CREATIVITY GRANTS**

Name	Department	Mentor	Title
Cade Armstrong	Biology	Jennifer Klein	Calmodulin as a Redox Sensor
Arini Arsana	Chemistry & Biochemistry	Kelly Gorres	Maximizing Overexpression and Solubility of a Protein of Unknown from in Kaposi's Sarcoma-Associated Herpesvirus (KSHV)
Alec Berchem	Theatre Arts	Greg Parmeter	The Bald Soprano: A Student Produced Production
Faith Bergmann	Microbiology	Paul Schweiger	Metabolic Engineering <i>Komagataeibacter</i> for Improved Production of Bacterial Cellulose
Teja Bhimavarapu	Biology	Alder Yu	Circadian Rhythm Effects on Diversity of Gut Bacteria of Fruit Flies (<i>Drosophila melanogaster</i>)
Anna Bower	Biology	Alder Yu	Investigating the Effect of Circadian Rhythm Disruption on USP8 Expression
Ally Brugler	Exercise & Sport Science	Ali Berry	Relationship Between Peak Power and Peak Velocity in a Jump Shrug
Mitch Bunting, Danielle Karch	Biology	Sierra Colavito	Targeted Therapy for Resistant Claudin-Low Breast Cancer Cells
Lauren Carstensen	Microbiology	William Schwan	Transcriptional Analysis of Two <i>Staphylococcus aureus</i> Biofilm-associated Genes in Regulatory Protein Mutant Strains
Olivia Clark	Biology	Anton Sanderfoot	Phototoxic Furanocoumarins of <i>Pastinaca sativa</i> (wild parsnip) as a Chemical Herbicide
Olivia Clark	Biology	Jennifer Klein	Sequencing the Microbiome of <i>Acropora palmata</i> in the Spanish Virgin Islands to find <i>Serratia marcescens</i> , the Bacteria Responsible for White Pox Disease
Alexis Condy, Hannah Bontrager	Psychology	Bianca Basten	Stressed to the Max: How Financial Stress Links to Students' Academic Decision Making
Vanessa Czeszynski	Biology	Eric Strauss	Sedimentation Behavior of Fine Particulate Matter in Lotic Systems: Can Titanium Dioxide be Used as a Predictive Model?

Name	Department	Mentor	Title
Adele Danner	Communication Studies	Sara Docan-Morgan	Pulled in Many Directions: An Exploration of How Emerging Adults Manage Relational and Identity Tensions in the Early Years of Marriage
Jacky Dickman, Alexandria Graeber	Biology	Christine Schwartz	Investigating Presence of Perineuronal Nets Surrounding Paravalbumin Expressing Neurons Seasonally in the Hibernating Ground Squirrel
Justin Donkin, Kyle Pulvermacher	Exercise & Sport Science	Joel Luedke	Comparison of Marc Pro Recovery System vs. PowerDot Recovery System in the Rated Perceived Exertion and Recovery of Athletes in the Quad
Mason Faldet	Physics	Taviare Hawkins	Quantifying Persistence Length Using Distribution of Curvature
Kean Fallon	Mathematics & Statistics	Nathan Warnberg	Rainbow Solutions to Equations
Kean Fallon	Mathematics & Statistics	Nathan Warnberg	Rainbow Solutions to Linear Diophantine Equations: Anti-Schur Numbers
Julie Fleegal	Biology	Jennifer Miskowski	Discovering the Mechanism of Action of CL-5
Emma Freeman	Microbiology	Xinhui Li	Inactivation of <i>Shigella sonnei</i> by a Novel Water Disinfection System Using Plastic Beads Coated with Agricultural Byproducts
Lee Fuller	Chemistry & Biochemistry	Sujat Sen	Synthesis of Copper-Based Catalysts for the Conversion of Carbon Dioxide to Valuable Chemicals
Emma Gavnik	Sociology & Criminal Justice	Nicholas Bakken	“Bro, Can I Hit Your Juul?”: The Social Contexts of Nicotine Addiction in the Age of Salt-Nic Devices
Arika Gehri, Mitch Bunting	Biology	Jennifer Klein	Characterization of the Genetic Diversity in <i>Acropora cervicornis</i>
Sara Gonske	Chemistry & Biochemistry	John May	Exploring Interactions Between Copper Resistance Protein DcrB and Extracellular Amino Acids
Matthew Gottlieb	Microbiology	Peter Wilker	Impact of Repeated Genetic Bottlenecks on the Growth Characteristics of Influenza

Name	Department	Mentor	Title
Samuel Gowan	Microbiology	Bernadette Taylor	Single Session Mindfulness Meditation Effects on Stress, Frontal Lobe Asymmetry, and Salivary Immunoglobulin-Alpha Production in a College Student Population
Sydney Graff	Geography & Earth Science	Gargi Chaudhuri	Mapping Past Mountaineering Fatalities in the Himalayas
Marisa Griesel	Chemistry & Biochemistry	John May	Identification of Protein Targets of Antimicrobial Compounds that Block Salmonella Antibiotic Resistance
Kalei Groshek	Educational Studies	Leslie Rogers	Inclusion: How Prepared are the Preservice Teachers?
Julie Gulling	Archaeology & Anthropology	Elizabeth Peacock	LGBTQ+ Perspectives on Discrimination in Social Services in La Crosse, WI
Jenna Hayes	Chemistry & Biochemistry	Kelly Gorres	Effect of Ornithine on the Lytic Cycle of EBV
Maggie Herms, Lucas Marinack	Psychology	Ryan McKelley	The Relationship between Past Trauma and Coping Strategy Formation
Megan Hickinbotham	Geography & Earth Science	Joan Bunbury	Collection and Analysis of a Lake Sediment Core for Understanding Periods of Floods and Droughts Since the Last Glacial Period
David Holmes	Geography & Earth Science	Niti Mishra	Monitoring Changes in Glacial Mass-balance and Surface Velocity of a Himalayan Glacier Using Unmanned Aerial Systems (UAS) Imagery
Megan Johnson, Nicolle Wein	Psychology	Berna Gercek Swing	Fat Stigma: Do Implicit Biases Lead to Explicit Discrimination in Educational Settings?
Daniel Johnson-Schunk	Geography & Earth Science	Niti Mishra	Mapping Invasive Grasses in a North American Prairie in Wisconsin Using Unmanned Aerial System (UAS) Imagery
Colin Johnson	Chemistry & Biochemistry	Sujat Sen	Surface Modifaction of Substrates with Electrically Conductive Polymers to Prevent Catalyst Erosion
Krista Johnsons, Sam Friederichs	Health Professions	Thomas Greiner	Foot and Ankle Movement Patterns in Humans, Chimpanzees, and Baboons
Jacob Kailing	Biology	Jennifer Klein	Data Collection and Analysis of Calmodulin Oxidation in C2C12 Cells

Name	Department	Mentor	Title
Jacob Kailing	Biology	Jennifer Klein	Calmodulin Redox Sensor Controls Muscle Cell Myogenesis
Ryan Killmer, Ethan Fenelon	Geography & Earth Science	Gargi Chaudhuri	Measuring Accessibility of Public Transit System in the La Crosse-Onalaska WI-MN
Sofia Kinzer	Archaeology & Anthropology	David Anderson	Developing a Protocol for the Documentation of In Progress Archaeological Excavations Using 3D Photogrammetry and Digital Image Enhancement
Jamie Kloehn	Chemistry & Biochemistry	Kelly Gorres	Investigation into a Protein of Unknown Function from Cancer-Associated Murine Herpesvirus 68
Jamie Kloehn	Chemistry & Biochemistry	Kelly Gorres	Structural Studies of a Protein of Unknown Function from Cancer-associated Murine Herpesvirus 68
Devyn Korish	Economics	Mary Hamman	Emissions Permissions: A Study of California's Smog Check Program
Maddy Kromke, Cassidy Fitzgerald	Exercise & Sport Science	Naoko Giblin	The Effect of Antipronation Kinesiology Taping on Running Load and Posture
Nico Lang	Chemistry & Biochemistry	Valeria Stepanova	Microwave-assisted Synthesis of Bidentate Ligands
Nico Lang	Chemistry & Biochemistry	Valeria Stepanova	The Study of the Effect of pH on Product Isolation in the Microwave-assisted Synthesis of Natural and Unnatural Curcumin
Camryn Larson	Biology	Roger Haro	Quantifying Nutrient Microdistribution in the Epizootic Algae on Larval <i>Glossosoma</i> (Trichoptera: Glossosomastidate) Cases
Grant Latus	Theatre Arts	Jeanne Willcoxon	Performing Arts of Our Time
John Lawlis	Political Science & Public Admin	Anthony Chergosky	Voting Against Party Interests: An Analysis of the Wisconsin State Legislature
Travis Leuzinger	Microbiology	Paul Schweiger	Effect of Circadian Rhythm on the Gut Microbiota of Fruit Flies (<i>Drosophila melanogaster</i>)
Jacob Lindstrand	Biology	Anita Baines & Jennifer Klein	Restoration Efforts on Soil Microbiome Diversity in Wisconsin Grasslands

Name	Department	Mentor	Title
Kristyn Loyva, Alix Raymond	Microbiology	Michael Hoffman	Role of the Carboxyl Terminus of the Human Parainfluenza Virus 3 Matrix Protein
Rose Lubinski	Microbiology	Paul Schweiger	Manipulating Gene Regulation to Increase Bacterial Cellulose Production
Ethan Lucas	Geography & Earth Science	Gargi Chaudhuri	Mapping Purple Loosestrife at Lake Neshonoc Using Deep Learning Classification Technique on Drone Imagery
Molly Lyngaas	Exercise & Sport Science	Ali Berry	Relationship Between Peak Power and Peak Velocity in a Jump Shrug
Ryan Maki	Chemistry & Biochemistry	John May	Viability of Fumarase Enzyme as a Target for New Antibiotics
Grace Marco	Communication Studies	Sara Docan-Morgan	The Effects of Managerial Humor on Job Satisfaction, Organizational Commitment, and Proactive Work Behavior: An Application of Leader-Member Exchange Theory
Regan McElfresh	Biology	Jaelyn Wisinski	Involvement of Rap1b in Regulating Megakaryocyte Replication
Lindsay McGovern, Jamie Wessel, Kate Brodigan	Biology	Jennifer Klein	Whole Genome Sequencing of Acropora Palmata with a Focus on Stress and Immune Response Genes
Juliette Moushon	Microbiology	Peter Wilker	Determining Significant Mutational Patterns in the H3N2 Influenza Virus
Kaylee Mulholland	Communication Studies	Uttara Manohar	Viewing Verbal Violence: University Students' Perceptions of Sexual and Non-Sexual Threats in Prison Dramas
Grace Muntifering	Biology	Jaelyn Wisinski	To Proliferate, or Not to Proliferate
Maria Nelson, Lauren Conley	Exercise & Sport Science	Naoko Giblin	It's a Mental Game: The Effects of Imagery on Psychological Factors and Physical Performance after Anterior Cruciate Ligament Reconstruction
Alison Obright	Music	Jonathan Borja	Music of the Misunderstood: A Bassoon Culture Study
Nu Ortiz	Health Education & Health Promotion	Keely Rees	Diabetes in the Ho-Chunk Nation: A Study on the Correlation Between Prevalence of Diabetes Type 2 in Immediate Families,

Name	Department	Mentor	Title
			Related Complications, and Disease Perception
Alyssa Oswald	Mathematics & Statistics	Huiya Yan	An Optimal Design of a New Freeway System
Bailey Parker	Archaeology & Anthropology	Constance Arzigian	Iconography on Tombstones throughout Ireland between the 16 th and 18 th Centuries as it Relates to the Cultural and Societal Changes During that Time
Sophie Pitney, Maren Youngquist	Psychology	Katherine Kortenkamp	Let's Talk about Climate Change—It's a Real Icebreaker
Marc Rademaker, Sadie Gunderson	Biology	Jennifer Klein	Characterizing the Microbiome of <i>Acropora cervicornis</i> , a Reef-building Coral
Kaitlyn Robbeloth, Morgan Brzank, Jenna Lee, Ashley Smits, Alexa Thurmes	Management	Christa Kiersch	Developing a Human Resource Toolkit for Nonprofit
Alexander Robbins	Chemistry & Biochemistry	Kelly Gorres	Structural Properties and Enzymatic Activity of dUTPase from Epstein-Barr Virus
Alexander Robbins	Chemistry & Biochemistry	Kelly Gorres	Effects of Three Conserved Residues in dUTPase from Epstein-Barr Virus on Enzyme Activity and Substrate Specificity
Patrick Robbins	Marketing	Marco Vriens	Return on Investment in Social Media
Bailey Ronnestrand, Lucas Anderson	Psychology	Michael Wong	The Effects of Meditation and Video Games on Stress Reduction: An Examination of Neural and Physiological Markers of Stress
Carly Rundle-Borchert	Art & English	Kathleen Hawkes & Kelly Sultzbach	Communicating Green
Jenna Sandstrom	Sociology & Criminal Justice	Carol Miller	Gender as a Moderating Variable in Undergraduate Study Abroad Participation and Advanced Degree Attainment
Veronica Sannes	Biology	Eric Strauss	Microplastic Concentrations in Upper Mississippi Tributaries

Name	Department	Mentor	Title
Stephen Schallert	Political Science & Public Admin	Regina Goodnow	The Rise of Fascism in the Interwar Years: A Case Comparison of Interwar Italy and France
Morgan Scheider, Megan Frueh, Tyler Tatro, Briana Nelson	Exercise & Sport Science	Naghmeh Gheidi	The Effect of Visual Feedback Concerning Dynamic Stability on Female Landing Mechanics
Pauline Schlais	Health Education & Health Promotion	Karen Skemp	Effects of a Plant-Based Diet and Intermittent Fasting Diet on Body Composition and Metabolic Markers in Overweight Individuals
Lillian Schulte	Microbiology	William Schwan	Role of MW2284 and MW2285 Proteins in Regulating <i>S. aureus</i> Biofilm Production
Rachael Selepa	Economics	Mary Hamman	Cost of Working with Chronic Pain
Sydney Smith	Art	Kathleen Hawkes	Environmental Preservation through Photographic Recreation: Studying the Photography of Ansel Adams and Allen Smith in a Modern Context
Alex Sonnek, Stacey Smith, Marin Bernhagen	Art	Lisa Lenarz	Testing Creative Lines of Inquiry in the Art Classroom
Fernando Souza	Microbiology	Michael Hoffman	The Role of the Matrix Protein N-Terminus on HPIV3 Budding
Joah Strauss	Physics	Taviare Hawkins	Microtubule Segmentation and Persistence Length Analysis
Samantha Stroozas	Communication Studies	Evan Brody	We Are Like Feminist Heroes Right Now: A Study of Female Sexual Empowerment Communication for Female-Identifying Viewers of Broad City
Lindsey Strzyzewski, Kambrie Haas, Veronica Eilers, Ally Gesteland, Colm Alba, Emma Hedding, Abby Stellmacher	Educational Studies	Heather Linville	Study of Migration on Education: Global Comparison between Japan and the US

Name	Department	Mentor	Title
Benjamin Taft	Finance	Ming Tsang	Targeting Aid During Economic Downturn
Ger Thao	Biology	Anne Galbraith	Effects of the Stilbenoid Compound CL-5 on <i>Saccharomyces cerevisiae</i>
McKenna Theine	Chemistry & Biochemistry	Kelly Gorres	The Effect of the Metabolic Pathway of Ornithine on the Epstein-Barr Virus Lytic Cycle
Michaela Thielen	Chemistry & Biochemistry	John May	Testing of Potential Antibiotic Molecules against Additional Stress Defense Systems of <i>Salmonella</i>
Isaac Trocinski	Chemistry & Biochemistry	John May	Analysis of DcrB Protein Mutations in Bacterial Copper Resistance
Kassidy Veness, Katrina Weltcheff	Psychology	Michael Wong	Mindful or Mind Full?
Gina Wade	Chemistry & Biochemistry	Daniel Grilley	Modeling the Hemolytic Function of Hpma within the Defined Functional Domain
Megan Wallen	Sociology & Criminal Justice	Carol Miller	What do Community Partners Want Out of the J-1 Visa Experience in Wisconsin Dells, WI?
Matthew Waller	Psychology	Alexander O'Brien	Sticking with It: Adherence to a Home-based Exercise Program
Carter West, Marc Rademaker	Biology	Sierra Colavito	Resistance in Triple Negative Breast Cancer: Biological Assays
Hannah Wheaton	Chemistry & Biochemistry	Kelly Gorres	Purification of the His-tagged ORF48 Protein Found within the KSHV Virus from Inclusion Bodies via Column Chromatography
Hannah Wheaton	Chemistry & Biochemistry	Kelly Gorres	Refolding of His-tagged ORF48 Protein Found within the Kaposi's Sarcoma-Associated Herpesvirus using Dialysis and Circular Dichroism (CD)
Leah Williams	Theatre Arts	Greg Parmeter	The Voice of the Silenced: Ethically Creating a Theatre Performance about Human Trafficking

Name	Department	Mentor	Title
Ashley Woltmann	Exercise & Sport Science	Naghmeh Gheidi	The Effect of Body Weight, Velocity, and Incline on Knee and Ankle Joint Kinematics
Hui Xin Wong	Archaeology & Anthropology	Constance Arzigian	Pottery Analysis at Yangganzhai, China: The Relationship between Pottery Inscriptions and the Possible Origins and Development of Chinese Characters
Lucas Wyrembeck	Philosophy	Samuel Cocks	Tolkien's Forms of Power: A Nietzschean Anti-moral Ontology of Middle-Earth

**2019 RECIPIENTS OF THE GRADUATE RESEARCH,
SERVICE, AND EDUCATIONAL LEADERSHIP AWARDS**

Name	Program or Department	Faculty Sponsor	Title
Josafat (Jay) Alessandri Chavez	Clinical Exercise Physiology	Salvador Jamie	Comparison of Muscle Oxygenation between Treadmill vs. Cycling Incremental Exercise Tests
Cait Atchison	Athletic Training	Naoko Giblin	Comparison of Knee Biomechanics during Baseball Batting with Different Footwear Conditions in College Athletes
Sylvia Binkley	Clinical Exercise Physiology	Carl Foster	Effects of Starting Strategy and Hazard Score on 10 km Cycling Performance
Xavier Brandon	Microbiology	William Schwan	Purification of the <i>Staphylococcus aureus</i> BrpR Protein and Confirmation of its DNA-Binding Ability
Cydney Byington	Athletic Training	Naoko Giblin	The Effect of Anti-Pronation Kinesiology Taping on Running Load and Posture
Jeremiah Christman, Michael Conway & Mykala Konrardy	Physical Therapy	Drew Rutherford	The Effect of Ankle Cryotherapy on Triple Forward Hop Performance in Healthy College-aged Participants
Christopher Cobus	Athletic Training	Cordial Gillette	Comparing the Effect of a Neuromuscular Training Program Completed in a Cool Down or Warm-up on the Incidence of Ankle Injuries
Stephanie Dietrich	Physical Therapy	Tom Kernozek	Differences in Ground Reaction Force and Movement Patterns During Competition Among Female Collegiate
Kathryn Fischer	School Psychology	Jocelyn Newton	School Based Anxiety Interventions: Support Begins with the Adults

Name	Program or Department	Faculty Sponsor	Title
Xaarki Ann Gamerdinger	Physical Therapy	Michele Thorman	Pelvic Health Physical Therapy Level 1 Advanced Certificate
Ashley Haut	School Psychology	Jocelyn Newton	Brief Coping Cat: Intervention Effectiveness for Students and Anxiety
Jeff Henderson	Biology: Aquatic Science	Meredith Thomsen	The Role of Large Wood in the Restoration of Habitat in the Upper Mississippi River System
Lao Lee	Clinical Exercise Physiology	Salvador Jamie	The Effects of High Intensity Boot Camp on Arterial Stiffness, Metabolic, Body Composition, and Performance
Andrew LeSage	Microbiology	Peter Wilker	The Effects of Repeated Bottlenecks on Influenza A Virus
Michelle Malysa	Microbiology	Xinhui Li	Development of Antiviral Edible Films Against Tulane Virus, a Human Norovirus Surrogate, in Selected Food Products
Austin Mancosky	Biology	Scott Cooper	13-Lined Ground Squirrel Platelets Exhibit Rod Formation that Leads to Cold Storage Lesion Resistance
Danielle McIntosh	Physical Therapy	Patrick Grabowski	The Effect on Motor Learning and Retention of a Drop Vertical Jump Landing Strategy in Males
Nathan Milanowski	Biology	Anne Galbraith	Expression of Cell Cycle Genes in Response to SK-03-92 Treatment of <i>Saccharomyces cerevisiae</i>
Amanda Milanowski	Athletic Training	Naoko Giblin	Injury Susceptibility Related to the Mental Health Status of Division III Athletes
Layne Nowlin	Human Performance	Glenn Wright	Soccer Player 80 Meter Sprint Performance
Alexandra Oines	Biology	Meredith Thomsen	Canopy Gap Dynamics in the Upper Mississippi River System Floodplain Forest

Name	Program or Department	Faculty Sponsor	Title
Kristina Pechacek	Biology: Aquatic Science	Eric Strauss	Habitat Use, Thermal Distribution, and Diet of Brook Trout (<i>Salvelinus fontinalis</i>) as Affected by Interspecific Competition with Non-Native Brown Trout (<i>Salmo trutta</i>) in the Driftless Region of Southwest Wisconsin
Bryana Petersin	Clinical Exercise Physiology	Salvador Jamie	Talk Test as a Measure of Exercise Intensity in Children
Annie Schauster	Biology	Todd Osmundson	Biology of Post-fire Regeneration in Ecologically and Commercially Valuable Morel Mushrooms
Elizabeth Schwab	Clinical Exercise Physiology	Salvador Jamie	The Effects of a Proper Cool Down on Potential Detriments from the High-Intensity Resistance Sessions
Dakota Villers	Biology	Barrett Klein	The Effect of Sleep on the Memory and Ability to Learn in <i>Apis mellifera</i>
Gregory Winkelman	Athletic Training	Cordial Gillette	Short-Term Effects of Kinesiology Tape on Force and Performance in Basketball-Related Dynamic Jumps
Khia Yang	Biology	Christine Schwartz	Hypothalamic Control of Feeding Behavior in the Thirteen-Lined Ground Squirrel

Presenter Index

P= Poster; O=Oral Presentations; E=Exhibits

F=Faculty & Staff; G=Graduate Students; U=Undergraduate Students

NAME	ABSTRACT(s)	NAME	ABSTRACT(s)
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Andersen,Maura	AP.U.1	Condy,Alexis	DP.U.3
Anderson,Emily	DP.G.27, DP.G.31	Conley,Alex	CP.U.8, DP.U.24
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Baugher,Ashley	DP.G.28	Downs,Alydia	BE.U.100, DP.U.4
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Berry,Laura	AP.G.23	Engholdt,Kaelan	AP.U.6
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Billings,Karina	DP.G.29	Ferrier,Kate	BP.U.1
Binkley,Sylvia	DE.G.100	Fischer,Katie	BP.G.34
Bock,Haley	AP.G.33	Fleegal,Julie	BP.U.6
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Bontrager,Hannah	DP.U.3	Friederichs,Sam	DP.U.10
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Buss,Anna	CP.U.7	Graff,Sydney	BP.U.8, CP.U.11
Butalla,Ashley	AP.G.25	Griesel,Marisa	BP.U.9
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Carpenter,Alexander	CP.G.44	Haas,Kambrie	CP.U.13
Carstensen,Lauren	AP.U.5	Haas,Raven	BP.U.10
Castle,Haley	BP.U.2	Hackel,Taylor	CP.U.14
Christman,Jeremiah	DP.G.32	Halley,Austin	CP.U.26
Clavette,Emilie	DP.G.30	Harding,Lauren	BP.G.35
Clement,Melissa	BP.U.4	Haut,Ashley	BP.G.36
Hed,Mikayla	CP.U.15	Hayes,Jenna	AP.U.7

NAME	ABSTRACT(s)	NAME	ABSTRACT(s)
Henderson,Jeffery	AP.U.8	Loyva,Kirstyn	BP.U.16
Hoffman,Nathaniel	DP.U.8	Lucas,Ethan	AP.U.9
Holmes,David	CP.U.16, DP.U.16	Lundberg,Jordan	DP.G.32
Huisman,Dena	BO.F.47	Lynch,Ryan	DP.U.14
Jaeger,Johnathon	CP.U.17	Lyngaas,Molly	AP.U.3
Jensen,Jillian	BP.U.11	Ma,Yuanman	CP.U.23
Jenson,Bryce	DP.G.28	MacDonald,Ryan	DP.U.14
John,Kadin	BP.U.12	Maki,Ryan	AP.U.10
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Johnson,Megan	AP.U.18	Martin,Joel	DP.U.15
Jozefacki,Jordan	AP.G.28	Martinco,Carly	CP.U.24, DP.U.16
Karch,Danielle	AP.U.4	Mauch,Emily	CP.U.25
Kiefer,Jasper	CP.U.18	Maurer,Theresa	DP.G.33
Kilmer,Ryan	CP.U.26	McAllister,Colin	CP.G.42
Kinney,Emily	AP.F.39	McIntosh,Danielle	CP.G.44
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Kolly,Amy	CP.U.20, DP.U.4	Moore,Taylor	CP.U.27
Konrardy,Mykala	DP.G.32	Mori,Danielle	CP.U.26
Korish,Devyn	CP.U.21	Moushon,Juliette	BP.U.17
Krien,Katie	DP.G.36	Mulholland,Kaylee	BP.U.18
Kruser,Ryan	AP.G.29	Muntifering,Grace	BP.U.19
Krzykowski,Kadie	CP.U.28	Muzi,Antoinette	CP.U.27
Kucksdorf,Jordan	BP.U.13	Myhrwold,Kaleb	BP.U.19
Laffin,Carley	BP.U.4	Nelson,Briana	DP.U.5
Lairson,Sarah	DP.G.36	Nisius,McKenzie	BP.U.4
Langer,Dylan	DP.U.14	Obright,Alison	DO.U.39
Larson,Merissa	BP.U.14	Ogurek,Cali	DP.G.29
Lee,Jenna	BP.U.3	Oines,Alexandra	DP.G.34
Lee,Lao	CP.G.49	O'Leary,Matigan	BP.U.22
Lee,Paul	BP.U.15	Osterhaus,Asthon	CP.U.35
LeSage,Andrew	AP.G.30	Oswald,Alyssa	AP.U.11
Leuizinger,Travis	BP.U.2	Ott,Sam	CP.U.17
Li,Hui	BO.G.44	Packard,Abraham	AP.G.31
Lindstrand,Jacob	DP.U.12	Paisley,Laura	BP.U.20
Lloyd,Courtney	CP.G.40	Palmer,Mycaiah	AP.U.12
Loomis,Bobbie Jo	CP.G.41	Parker,Bailey	BP.U.21
Lowery,Anna	BP.G.33	Parrott,Mary	AP.G.27
Peters,Nicholas	CP.G.44	Pearson,Brianna	BP.U.22
Petrie,Zachary	CP.U.1	Pechacek,Kristina	AP.G.32
Pitney,Sophie	BP.U.23, DP.U.16	Peplinski,Rebekah	DP.U.17

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Prill, Taylor	DP.U.4	Stanton, Brea	CP.G.38
Pulvermacher, Kyle	AP.U.13	Stellmacher, Abby	CP.U.13
Rademaker, Marc	BP.U.24	Stroozas, Samantha	DP.U.22
Rand, Sarah	DP.G.35	Strzyewski, Lindsey	CP.U.13
Reissner, Zoe	DP.U.4	Swigart, Austin	DP.G.37
Riesgraf, Kelly	AP.G.33	Taft, Benjamin	BO.U.42
Robbeloth, Kaitlyn	BP.U.3	Tanis, Kyle	DP.U.23
Robbins, Alex	BP.U.25	Tatro, Taylor	DP.U.5
Rohman, Ellie	BP.U.26	Thao, Ger	CP.U.32
Ronnestrand, Bailey	CP.U.1	Theine, McKenna	CP.U.33
Ross, Kimberly	BP.G.33	Thielen, Michaela	AP.U.17
Rotzenberg, Alyssa	CP.G.44	Thompson, Kimberly	CP.U.34
Rozek, Ellen	BP.U.41	Thompson, Owen	DP.U.24
Ruetten, Laik	AP.U.14	Thurmes, Alexa	BP.U.3
Rutherford, Drew	AP.G.35, DP.G.32	Tousey, Dylan	CP.U.35
Ruzicka, Adrea	CP.U.28	Trass, Raffy	CP.U.8, DP.U.24
Ryan, Jennifer	AP.U.15	Treuthardt, Jessica	CP.G.44
Salas, Rosa	DP.U.19	Trocinski, Isaac	DP.U.25
Sannes, Veronica	BP.U.27	Tryan, Adrienne	AP.G.35
Schallert, Stephen	DP.U.20	Van Duyne, Ingrid	DP.G.29
Schauls, Olivia	DP.U.21	Vanselow, Mathew	CP.U.36
Schauster, Annie	AP.G.34	Veness, Cassidy	AP.U.19
Scheevel, Kayla	BP.G.39	Villers, Dakota	CP.G.45
Scheider, Morgan	DP.U.5	Stanton, Brea	CP.G.38
Schmazl, Andrew	AP.G.27	Stellmacher, Abby	CP.U.13
Schmidt, Sara	AP.U.16	Stroozas, Samantha	DP.U.22
Schulte, Lillian	BP.U.28	Strzyewski, Lindsey	CP.U.13
Schwab, Elizabeth	DE.G.101	Swigart, Austin	DP.G.37
Schwecke, Karissa	AP.G.35	Taft, Benjamin	BO.U.42
Sebranek, Katie	CP.U.29	Tanis, Kyle	DP.U.23
Selepa, Rachael	CO.U.47	Tatro, Taylor	DP.U.5
Sether, Jenna	BP.G.40	Thao, Ger	CP.U.32
Seubert, Brooke	BP.G.35	Theine, McKenna	CP.U.33
Siekert, Megan	AP.G.23, AP.G.36	Thielen, Michaela	AP.U.17
Simoni, Aaron	AP.G.37	Thompson, Kimberly	CP.U.34
Smith, Sydney	BE.U.101	Thompson, Owen	DP.U.24
Smits, Ashley	BP.U.3	Thurmes, Alexa	BP.U.3
Souza, Fernando	CP.U.30	Tousey, Dylan	CP.U.35
Splinter, Noah	DP.G.36	Trass, Raffy	CP.U.8, DP.U.24
Stachow, Haylee	BP.U.29	Treuthardt, Jessica	CP.G.44
Stacy, Shianna	BP.U.2	Trocinski, Isaac	DP.U.25
Stanley, Laura	AP.F.39	Tryan, Adrienne	AP.G.35
Van Duyne, Ingrid	DP.G.29	Welke, Mariah	AP.G.38
Vanselow, Mathew	CP.U.36	Weltcheff, Karina	AP.U.19
Veness, Cassidy	AP.U.19	Wernimont, Calvin	BP.U.12
Villers, Dakota	CP.G.45	West, Carter	BP.U.24

NAME	ABSTRACT(s)	NAME	ABSTRACT(s)
Vollmer,Nicholas	DP.G.32	Wheaton,Hannah	AP.U.20
Volp,Carly	DP.G.38	White,Claire	DP.G.36
Von Bruenchenhein,Trace	DP.G.38	Wichlacz,Jordyn	BP.U.31
Vue,Gaoying	CP.U.35	Wilson,Jamin	DP.U.2
Walder,Heather	AP.F.39	Woltmann,Ashley	AP.U.21
Waller,Matthew	BP.U.30	Wong,Hui Xin	BO.U.43
Weidbusch,Alex	AP.G.27	Yang,Khia	BO.G.46
Wein,Nicolle	AP.U.18	Young,Kieran	CP.U.36
Weinhold,Matthew	AP.G.25	Youngquist,Mari	BP.U.23
Weiss,Carly	BP.U.1	Zinnel,Laura	CP.U.37
Weiss,Susan	AP.U.21	Zychowski,Kyle	AP.G.27

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