
APRIL 10, 2015
MICHIGAN STATE UNIVERSITY
UNIVERSITY UNDERGRADUATE
RESEARCH & ARTS FORUM

AIGA Detroit

AIGA, the professional association for design, is committed to advancing design as a professional craft, strategic tool and vital cultural force.

Christie Evenson, a student member of the AIGA Detroit MSU student group, created the cover design. Inspired by the work presented at UURAF, Christie deconstructed the letterforms to represent the layered research process. As a central image, the Spartan Statue reflects MSU's role as one of the top research universities in the world.

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WELCOME

Welcome to the 17th annual University Undergraduate Research and Arts Forum at Michigan State University. Throughout the day, undergraduate students from diverse academic disciplines will present their outstanding research and creative endeavors. We are pleased to announce that this is the largest Forum in the event's history, with more than 750 students from 14 different colleges participating today. These students were mentored by more than 400 faculty members.

As one of the nation's leading research institutions, MSU offers a breadth of experiences and opportunities that actively engage students in their education. Through undergraduate research and creative activities, students work closely with leading scholars to gain in-depth knowledge about their fields of study and have opportunities to apply classroom learning to real life situations.

Many have contributed to make this growing event a success. We offer special thanks to the UURAF Team, Emily Bank, Aliya Beavers, and Nadeeka Karunaratne, from the Associate Provost for Undergraduate Education's Office, for assisting with the coordination of this event and to the many staff members from across campus who volunteered their time. The cover art was designed by Christie Evenson, '15, who is pursuing a Bachelor of Fine Arts in studio art. Christie is a member of the AIGA Detroit MSU student group.

We acknowledge President Lou Anna K. Simon and Provost June Pierce Youatt's continued support of undergraduate education and research at MSU. UURAF received support, guidance, and planning from Associate Provost Douglas Estry; Dean Cynthia Jackson-Elmoore from the Honors College; several undergraduate associate and assistant deans; Dr. Korine Wawrzynski, Assistant Dean, Academic Initiatives, and Director, Undergraduate Research; and Megan Shannahan, Assistant Director, Undergraduate Research. We thank the many dedicated mentors who guided the research projects and creative activities presented today, the faculty members serving as judges, and the graduate students providing feedback.

We encourage our student participants, research mentors, and other visitors to walk around the forum and learn about the impressive work of our next generation of scholars, performers, and researchers. Thank you for joining us.

MICHIGAN STATE
UNIVERSITY

AWARDS CEREMONY

Please join us at 4:00 PM for the awards presentation in Union Room 50 (located on the Basement Level) during which the prize winners in the various categories will be announced. We encourage all participants to stay for the awards ceremony and to invite their families, friends, mentors, and faculty members to attend.

To recognize exemplary scholarly achievements, monetary prizes will be awarded. One first-place award ($100) will be given in each section. Students working together in groups of four or less will each receive the award money independently. The maximum amount awarded for groups with five or more members will be $400, and the award money will be evenly distributed amongst the group members. Award money will be deposited directly into the student's MSU account.

First-place award recipients will be considered for the grand prize award, which will be announced in early summer. All first-place award recipients will be contacted to submit a brief paper on their UURAF program topic and an electronic version of their poster or oral presentation. Several associate deans as well as the Editorial Board and staff members for the *Red Cedar Undergraduate Research Journal* (*ReCUR*) will review submissions. A total of two grand prizes ($500 each) will be awarded to one program from the science and engineering categories and one program from the humanities, social sciences, and communication arts and sciences categories.

MSU'S BECKMAN SCHOLARS PROGRAM

The Beckman Scholars program cultivates promising research scientists through quality mentoring, unique research experiences, and academic recognition. Beckman mentors and their research teams prepare the scholars for a modern research environment that requires teamwork and multidisciplinary expertise. Each candidate participates in innovative and exceptional training experiences that make them strong candidates for graduate and professional programs. Students' research is conducted in one of four areas: Molecular Metabolism and Disease (MMD), Intestinal microbiome and its role in health and diseases (ERIN), Evolution and big data sets (BEACON), and Neuroscience. Beckman Scholars are selected through a competitive application process in early February. Visit http://bit.ly/1N98psD for detailed information. Dr. Laura McCabe, Professor of Physiology, directs the program. **The Beckman Scholars Program is funded by the Arnold and Mabel Beckman Foundation.**

2015 BECKMAN SCHOLARS PROJECTS

Rebecca Benjamin
Project: COMPARING SEX DIFFERENCES IN ANIMAL MODELS OF POST-TRAUMATIC STRESS DISORDER
Category: Integrative and Organismal Biology, Section 2, Poster 322
Location: Ballroom, 1:00 PM-3:00 PM
Mentor(s): Marc Breedlove (Neuroscience), Cynthia Jordan (Neuroscience), Apryl Pooley (Neuroscience)

Jacob Gibson
Project: DETERMINING THE EFFECTS OF PSEUDOMONAS AERUGINOSA BIOFILMS ON WOUND HEALING IN A DIABETIC MURINE MODEL
Category: Microbiology, Immunology, and Infectious Disease, Section 4, Poster 387
Location: Ballroom, 1:00 PM-3:00 PM
Mentor(s): Julia Busik (Physiology), Christopher Waters (Microbiology and Molecular Genetics)

Sarah MacLachlan
Project: LION AND HYENA INTERACTION
Category: Integrative and Organismal Biology, Section 1, Poster 318
Location: Ballroom, 1:00 PM-3:00 PM
Mentor(s): Kay Holekamp (Zoology), Kenna Lehmann (Zoology), Tracy Montgomery (Zoology)

TABLE OF CONTENTS

SCHEDULE OF EVENTS

All events occur in the MSU Union

TIME	EVENT	LOCATION
MORNING REGISTRATION, 8:00-9:00 AM		
8:00-8:45 AM 8:15-9:00 AM	Morning oral presentations Morning poster presentations	2nd Floor Concourse
ORAL PRESENTATIONS, SESSION 1, 9:00-11:00 AM		
8:30-9:00 AM 9:00-11:00 AM	Download PowerPoint presentations onto room computers Presentations delivered throughout session	Lake Erie Room Lake Michigan Room Lake Ontario Room Lake Superior Room MSU Room
POSTER PRESENTATIONS, SESSION 1, 9:00-11:00 AM		
8:30-9:00 AM 9:00-11:00 AM 11:00-11:15 AM	Set up posters in assigned locations Display and judging time for posters Students take down their posters	Ballroom Engagement Center Lake Huron Room Mosaic Multipurpose Room 2nd Floor Concourse 3rd Floor Hallway
ORAL PRESENTATIONS, SESSION 2, 11:00 AM - 1:00 PM		
10:30-11:00 AM 11:00 AM - 1:00 PM	Register and download PowerPoint presentations onto room computers Presentations delivered throughout session	Lake Erie Room Lake Michigan Room Lake Ontario Room MSU Room
AFTERNOON REGISTRATION, 12:00-1:00 PM		
12:00-12:45 PM 12:15-1:00 PM	Afternoon oral presentations Afternoon poster presentations	2nd Floor Concourse
ORAL PRESENTATIONS, SESSION 3, 1:00-3:00 PM		
12:30-1:00 PM 1:00-3:00 PM	Download PowerPoint presentations onto room computers Presentations delivered throughout session	Lake Erie Room Lake Michigan Room Lake Ontario Room Lake Superior Room MSU Room Tower Room
POSTER PRESENTATIONS, SESSION 2, 1:00-3:00 PM		
12:30-1:00 PM 1:00-3:00 PM 3:00-3:15 PM	Set up posters in assigned locations Display and judging for posters Students take down their posters	Ballroom Engagement Center Lake Huron Room Mosaic Multipurpose Room 2nd Floor Concourse 3rd Floor Hallway
AWARDS CEREMONY, 4:00-5:00 PM		
4:00-5:00 PM	All UURAF participants, faculty, and guests are encouraged to return for the awards ceremony.	Room 50, Ground Floor (Basement)

POSTER PRESENTATION LOCATIONS

MORNING POSTER PRESENTATIONS

These posters will be displayed 9:00-11:00 AM

CATEGORY	SECTION	LOCATION
Agriculture & Animal Science	1 & 2	Ballroom
Anthropology	1	Ballroom
Biochemistry & Molecular Biology	1 & 2	Lake Huron Room
Business	1	3rd Floor Hallway
Cell Biology, Genetics, & Genomics	1 & 2	Mosaic Multipurpose Room
Communication Arts & Sciences	1 & 2	Ballroom
Education	1	Ballroom
Engineering, Computer Science, & Mathematics	1 & 2	Ballroom
Environmental Science & Natural Resources	1 & 2	Ballroom
Epidemiology & Public Health	1	2nd Floor Concourse
Graphic Design	1	Lake Huron Room
Humanities & Performing Arts	1	3rd Floor Hallway
Kinesiology	1	Lake Huron Room
Microbiology, Immunology, & Infectious Disease	1 & 2	Mosaic Multipurpose Room
Neuroscience	1, 2, & 3	Ballroom
Physical Sciences	1 & 2	Lake Huron Room
Psychology	1 & 2	Lake Huron Room
Social Science: General	1 & 2	2nd Floor Concourse
Social Work	1	Engagement Center

AFTERNOON POSTER PRESENTATIONS

These posters will be displayed 1:00-3:00 PM

CATEGORY	SECTION	LOCATION
Agriculture & Animal Science	3	Mosaic Multipurpose Room
Biochemistry & Molecular Biology	3	Mosaic Multipurpose Room
Business	2	3rd Floor Hallway
Cell Biology, Genetics, & Genomics	3 & 4	Ballroom
Communication Arts & Sciences	3 & 4	Mosaic Multipurpose Room
Education	2 & 3	2nd Floor Concourse
Engineering, Computer Science, & Mathematics	3, 4, & 5	Ballroom
Environmental Science & Natural Resources	3	Ballroom
Epidemiology & Public Health	2 & 3	Lake Huron Room
Graphic Design	2	Lake Huron Room
Humanities & Performing Arts	2	Lake Huron Room
Integrative & Organismal Biology	1 & 2	Ballroom
Kinesiology	2	Lake Huron Room
Linguistics, Languages, & Speech	1	Ballroom
Microbiology, Immunology, & Infectious Disease	3, 4, & 5	Ballroom
Neuroscience	4	Lake Huron Room
Physical Sciences	3	Lake Huron Room
Plant Sciences	1 & 2	Engagement Center
Psychology	3 & 4	Ballroom
Social Science: General	3	Lake Huron Room
Social Work	2	2nd Floor Concourse
Toxicology	1	3rd Floor Hallway

NOTE: Room locations and presentation times are subject to change. Please check the registration area for the most accurate program information. A map of the Union is located on the inside back cover.

ORAL PRESENTATION LOCATIONS

MORNING ORAL PRESENTATIONS, SESSION 1

This session begins at 9:00 AM and runs continuously until 11:00 AM

CATEGORY	SECTION	LOCATION
Business	1	Lake Michigan Room
Digital Media	1	Lake Ontario Room
History, Political Science, & Economics	1	Lake Erie Room
Humanities & Performing Arts	1	Lake Superior Room
Social Science: General	1	MSU Room

MORNING ORAL PRESENTATIONS, SESSION 2

This session begins at 11:00 AM and runs continuously until 1:00 PM

CATEGORY	SECTION	LOCATION
Digital Media	2	Lake Ontario Room
History, Political Science, & Economics	2	Lake Erie Room
Integrative & Organismal Biology	1	Lake Michigan Room
Kinesiology	1	MSU Room

AFTERNOON ORAL PRESENTATIONS

This session begins at 1:00 PM and runs continuously until 3:00 PM

CATEGORY	SECTION	LOCATION
Agriculture & Animal Science	1	Lake Michigan Room
Biochemistry & Molecular Biology	1	Tower Room
Digital Media	3	Lake Ontario Room
Humanities & Performing Arts	2	Lake Erie Room
Neuroscience	1	Lake Superior Room
Social Science: General	2	MSU Room

NOTE: Room locations and presentation times are subject to change. Please check the registration area for the most accurate program information. A map of the Union is located on the inside back cover.

ABSTRACTS

Abstracts are organized by discipline and then by presentation time or poster number within each category. Oral presentations are listed first followed by poster presentations.

AGRICULTURE & ANIMAL SCIENCE

ORAL PRESENTATIONS, SECTION 1
LAKE MICHIGAN ROOM, 1:00-2:45 PM

PATHOTYPING CURRENT MAREK'S DISEASE VIRUS FIELD STRAINS IN ORDER TO PREDICT VIRULENCE
William Ratledge
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 1:00 PM-1:15 PM
Mentor(s): Catherine Ernst (Animal Science)

Marek's disease (MD) is a lymphoproliferative disease of chickens caused by Marek's disease virus (MDV). Its tendency to evolve toward greater virulence poses a major challenge to the poultry industry. The increased use of highly protective vaccines has successfully prevented Marek's outbreaks, but a comprehensive assessment of MDV field strains has not been conducted since 1999. We hypothesize that increased use of Rispens vaccine and improved poultry genetics have contributed to, and are masking, an increase in MDV virulence since 1999. This project intends to help the industry prepare to control future MD outbreaks by providing data on the virulence of contemporary MDV strains and by molecular characterization of these strains within individual and between neighboring farms. Current strains will be evaluated by pathotyping 18 MDV field isolates from six farms in at least two separate geographic locations; selection will be based on current MD outbreaks and availability of past isolates. Phenotypic and genotypic analysis of virulence will be conducted in order to pathotype the 18 field isolates selected. If MDV pathogenecity has increased since 1999, we expect to see virulence scores matching or exceeding MDV isolate 686, the most virulent strain in our virus collection. Findings from this study will ideally help establish alternative methods of determining MDV pathotype by providing evidence on the prevalence of MDV sequence variation. Determining the effect of genetic background of chickens on the molecular epidemiology will contribute to the improvement of MD genetic resistance.

STUDY OF EQUINE GENE UGT1A1 IN ASSOCIATION WITH GILBERT'S SYNDROME
Ashley Foley
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 1:15 PM-1:30 PM
Mentor(s): Susan Ewart (Large Animal Clinical Sciences)

BACKGROUND: The UGT1A1 gene is part of the UDP glucuronosyltransferase family, which is a group of genes that catalyze a glucuronidation reaction. The UGT1A1 gene encodes for polypeptide A1, which conjugates bilirubin (a byproduct of heme catabolism) to a hydrophilic molecule that can be excreted into bile. When not functioning properly, there are high levels of unconjugated bilirubin present (hyperbilirubinemia). The human condition Gilbert's Syndrome is characterized by unconjugated hyperbilirubinemia due to mutations in the UGT1A1 gene. We studied a horse with clinical characteristics of Gilbert's Syndrome. We hypothesized that mutation(s) in the UGT1A1 gene or it regulatory sequence are present in this horse. METHODS: The UGT1A1 coding sequence containing five exons and 4kb of the upstream regulatory sequence were evaluated for mutations. Amplification primers were designed using Primer3 software. The DNA from the affected horse and from two unaffected horses (controls) was sequenced, aligned, and compared to the reference equine genome EquCab2 assembly as well as 36 horses sequenced by another lab. RESULTS: The affected horse has a unique 18 basepair insertion that is not a clean repeat that was not found in the control horses, the reference sequence, or the additional 36 horses. No other differences found between the DNA sequences were unique to the case horse. CONCLUSIONS: The unique insertion is located in an area with no known transcription factors and is in a very repetitive region. A next step is to obtain a sample from another case horse presenting with the same symptoms.

THE INFLUENCE OF AVIARY RAISED PULLETS PLACED IN CONVENTIONAL HOUSING ON BONE STRUCTURE
Natalie Smith
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 1:30 PM-1:45 PM
Mentor(s): Darrin Karcher (Animal Science)

Housing systems for laying hens have been a concerning topic to the public and the industry. This study used alternative systems to understand the importance of pullet housing on adult laying hens by analyzing the hen's bone formation and resorption. In order to obtain a greater understanding of the housing effects on pullets, Lohmann White pullets were moved from an aviary system at 19 weeks of age to either an aviary hen system (AV) or conventional cages (CC) as part of the Coalition of a Sustainable Egg Supply research project. There were 120 hens at week 77 that were euthanized from each system and the right and left Tibiae and Humeri were collected and analyzed. All samples went through Quantitative Computed Tomography in order to analyze their structure. The acquired images were then reconstructed and analyzed using MIMICS (Materialise® Inc.) Software. Humeri and Tibiae of AV hens had greater cortical thickness and density compared to AC hens ($P < 0.05$). The cortical area of the AV hens was also larger when contrasted to the AC hens ($P < 0.05$). These findings indicate that hens moved to an AV system with moderate mobility had increased measurements of bone parameters, while AC hens with restricted movement had a loss of bone mass and density.

SPATIAL, TEMPORAL, AND COHORT-RELATED VARIATION OF WILD CHINOOK SALMON IN LAKE MICHIGAN
Shane Flinn
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 1:45 PM-2:00 PM
Mentor(s): Michael Jones (Fisheries and Wildlife)

Chinook salmon (Oncorhynchus tshawytscha) also called King salmon, were introduced into the Great Lakes in the 1960s, as a means of predatory control for the invasive alewife (Alosa pseudoharengus) population. Since their introduction, they have been stocked extensively, and have substantially changed the pelagic fish community of Lake Michigan. Chinook salmon in Lake Michigan now support a multi-billion dollar sport fishing industry. Recently has been suggested that natural recruitment of Chinook salmon in Lake Michigan accounts for about half of all year-1 salmon and that wild salmon may have a higher survival rate than hatchery-reared fish. To further understand natural recruitment of Chinook salmon in Lake Michigan, from 2006-2010 all hatchery fish were dosed with oxytetracycline, (OTC) before being released in Lake Michigan, which creates a fluorescent mark on their vertebrae. Chinook salmon were collected from Lake Michigan anglers between 2007-2013 and analyzed for the presence or absence of the OTC mark to determine their origin (wild or hatchery). The objectives of this research project are to analyze these data to determine the proportion of hatchery and wild salmon in Lake Michigan for the 2006-2010 year classes, and to identify temporal, spatial, and age-related trends in these proportions, and also for differences in biological trends, such as growth and survival, between hatchery and wild salmon. Trends in the relative composition of wild and hatchery-reared Chinook salmon are important for fisheries managers to understand in order to make informed decisions about salmon stocking rates into Lake Michigan in the future.

ELUCIDATION OF THE SCOPOLAMINE BIOSYNTHETIC PATHWAY IN ATROPA BELLADONNA
Joseph Uebler
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 2:00 PM-2:15 PM
Mentor(s): Cornelius Barry (Horticulture)

Alkaloids are an abundant and heterogeneous group of specialized metabolites, characterized by the presence of a basic nitrogen atom (O'Connor, 2010). Many alkaloids possess pharmacologically significant effects, including caffeine, morphine, cocaine, and scopolamine. In particular, the tropane alkaloids hyoscyamine and scopolamine, which are produced by specific members of the Solanaceae family, including Atropa belladonna, Hyoscyamus niger, and Datura stramonium, are noted for their anticholinergic effects. The pathway and enzymes involved in hyoscyamine and scopolamine biosynthesis are not fully elucidated (O'Connor, 2010; Jirschitzka 2013) although transcriptome sequencing of A. belladonna has illustrated the potential of this technology in identifying the missing components and has recently been used to discover a novel, root-specific, phenylalanine aminotransferase, AbArAT4, which carries out the first dedicated step in the conversion of phenylalanine to phenyllactic acid, a precursor of scopolamine (Bedewitz et al. in revision). Condensation of phenyllactic acid with tropine to form littorine, currently also represents an unknown step in scopolamine biosynthesis that has been proposed to occur through the action of coenzyme A dependent BAHD type acyltransferases (Jirschitzka et al. 2013). An alternative acylation pathway also operates in plant specialized metabolism through the action of plant-specific serine carboxypeptidase-like (SCPL) acyltransferases that catalyze glucose ester-dependent transacylations, which require glucosyltransferases (GTs). Root-specific BAHDs, GTs, and SCPLs have been identified in the A. belladonna transcriptome. This research explores the nature of involvement by opposing BAHD dependent and SCPL dependent acylations of the tropine ring.

COMPETITION BETWEEN OSTRACODS AND FILTER-FEEDING ZOOPLANKTON
Kathryn Heffernan
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 2:15 PM-2:30 PM
Mentor(s): Scott Peacor (Fisheries and Wildlife)

Ostracods, commonly known as seed shrimp, are part of the class Crustacea. They are bottom-feeding organisms, typically about 1 mm in size. They are known to be a common species in lakes and ponds, yet little research has been done on their ecology. We were intrigued by their high densities in experiments conducted in 2013 and 2014, in which we examined effects of fish on zooplankton, tiny organisms that float freely in water. We were unsure as to how Ostracods were interacting with filter-feeding zooplankton, but we hypothesized that they may be competing with them for the same resources. In order to make this interaction more clear, we conducted a feeding experiment to see if Ostracods were eating phytoplankton, or microalgae, which is a main food source for other zooplankton. We found that Ostracods do in fact eat phytoplankton, and this reduction in phytoplankton indicates that there could be competition between the two. This is important in nature because zooplankton are a large part of the diet of fish, therefore Ostracods could affect the entire food web by consuming the same resources. The next step in our research would be to study the extent of this competition between Ostacods and filter-feeding zooplankton in a more natural environment.

ATTACKS FROM BELOW: UNEARTHING THE IMPACTS OF BELOWGROUND HERBIVORES ON FOLIAGE FEEDER SUCCESS
Jessica Kansman
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room
Time: 2:30 PM-2:45 PM
Mentor(s): Jared Ali (Entomology)

Research focused on the interplay of herbivores feeding above and belowground in agricultural systems is a sparsely inhabited field with major implications. Root herbivory can have major effects on the types of chemicals induced within a plant's volatile profile, along with the amount of vegetation produced at the surface. Limited vegetation and induced plant defenses influence herbivore success aboveground. Likewise, the presence of herbivores on the leaf surface impacts host-plant choice for root feeders. Herbivores belowground locate their host-plants utilizing chemical cues given off by plants. These volatiles can be masked by plants in response to stress, like that associated with leaf feeding, making the plant seem less desirable to root feeders. In this project, we observed how aboveground herbivory influenced plant preference of root feeding larvae, wireworms (Limonius californicus), in corn systems. We also examined whether root feeding impacts the success of aboveground foliage feeders, Beet Armyworm (Spodoptera exigua). The effects of these root feeding herbivores is significant for agriculture, but the nature of these pests is far less well known than that of foliage feeders. Understanding the effects of belowground herbivores on crop systems and their aboveground pests will be very important for the development of pest control strategies in agriculture.

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

SAVING CIVILIZATION ONE TOMATO AT A TIME
Colleen Otte
Category: Agriculture and Animal Science, Section 1
Poster: 1
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Bonnie Bucqueroux (Journalism)

The purpose of this research is to build a foundation for the eBook Saving Civilization One Tomato at a Time by Bonnie Bucqueroux. The project offers practical approaches to building a civilized food future in the face of climate change and economic instability, and encourages people to be conscientious of human and environmental values – rather than just corporate values – in producing and consuming food. By examining the history of crops like the widely-consumed tomato and analyzing past events such as the formation of the Enclosure Acts, Agricultural Revolution and ensuing Industrial Revolution in England, the project allows for a better understanding of the food system's current state of affairs and forms a basis for more accurate projections of the future of food.

BEYOND THE MONETARY VALUE OF OUR LANDS
Zhulieta Stoyanova
Category: Agriculture and Animal Science, Section 1
Poster: 3
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Scott Swinton (Agricultural, Food, and Resource Economics)

As our reliance on energy increases faster than ever before, new research is looking for ways to expand the potential of growing bioenergy crops for fuel. Remote sensing is used to search for how much land is available to grow crops that can be made into biofuels, but the GIS satellites that display the data do not take into account the preferences of the landowners. The

problem created is that landowners might not agree to set aside all or even part of their marginal land for bioenergy production. My research will focus on how willing landowners actually are to rent their land for bioenergy crops if they use it for recreational purposes compared to income generating purposes. This poster will focus on data collected from surveys sent out to Michigan and Wisconsin landowners who have either agricultural cropland, farmable non-crop land or forested land in order to demonstrate that there is an intrinsic value to the land and often the type, amount and especially purpose of use affect decision making more than money. Often, people act differently than predicted and in order to receive accurate results there needs to be work with both the technological aspect of data, such as remote sensing techniques, but also the social aspect, such as these surveys.

ACUTE AND PROLONGED EFFECTS OF VIBRATING PLATFORM TREATMENT ON HORSES: A PILOT STUDY
Chelsea Nowlin
Category: Agriculture and Animal Science, Section 1
Poster: 4
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Brian Nielsen (Animal Science), Hal Schott (Large Animal Clinical Sciences)

Emerging anecdotal evidence on EquiVibe vibrating platforms and their success with healing injuries and improving performance in horses has prompted a study hypothesizing that various physiological parameters will be altered due to EquiVibe treatment as compared to horses in a control group. Six aged-Arabian horses known or suspected of having gait deficits will have their stride lengths measured and will undergo lameness evaluations by a licensed equine practitioner, to document and score any potential lameness, gait deficits, or limited flexibility. Age, gender, total lameness scores, and stride lengths will be used to stratify and pair-match horses before placing them on one of two treatments – EquiVibe (EV) or control (CO). The EV horses will stand on a turned-on platform for 30 minutes, and CO horses will stand on a turned-off platform for 30 minutes. In order to determine the acute response to the treatment, horses will undergo a second lameness evaluation within 30 minutes by the same veterinarian who previously scored them, and who will remain blinded to the treatment. Stride length and heart rate will also be reevaluated. Horses will remain on their respective treatment for 6 weeks, and treatment (either EV or CO) will take place five days per week to evaluate the prolonged effects of treatment. Similar tests will be conducted at the completion of the six-week period. Differences in pre- and post- treatment will be compared between EV and CO groups. This study will commence in March with acute responses being reported at the forum.

SOIL MOISTURE YIELD ON WOODY BIOFUELS
Tara Murray
Category: Agriculture and Animal Science, Section 1
Poster: 5
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Stephanie Grand (Forestry)

Currently there is a big demand for sustainable fuels, we are specifically interested in biofuels. The demand for nutrient rich soil is high for consumption crops so we looked at using woody crops such as willow and poplar trees, for the use of biofuels. They are able to grow on less nutrient rich soils so that they wouldn't be competing with land for other crops. We had planted these trees at different sites in Michigan and Wisconsin and had come up with varying results on tree growth and had unexplained inconsistencies between the varying plots. So we began to look into how the soil moisture could be affecting these crops and if this was resulting in the inconsistencies. To test this we had 6 different field sites in northern Michigan and collected soil samples from each site at different depths, 0-10 cm, 10-25 cm up to 1 meter. We used a correlation and regression analysis to study the relation of moisture and productivity of the trees at the field sites. We found that the deep soil moisture at these sites were major predictors to the productivity of the crops, such that at sites with a lot of clay and high moisture in the soil, such as Escanaba, that this would lead to lower productivity in the woody crops. This has major importance for assessing soil conditions to predict a sites success in being a biofuel plantation.

ASSOCIATIVE LEARNING: COGNITIVE EVOLUTION IN SYMPATRIC FISH
Peter Vites, Clayton Batko
Category: Agriculture and Animal Science, Section 1
Poster: 6
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Janette Boughman (Zoology), Jason Keagy (Zoology)

Our understanding of how cognitive abilities evolve is incomplete. The ability of an organism to associate events and modify its behavior accordingly is integral to being able to adapt in an ever-changing environment. Previous research on learning in fish has heavily focused on foraging ability and predator avoidance. However, research has largely ignored variables such as the largest amount of time between two events that can be successfully associated, or how long a learned association can be retained for. These variables are fundamental to learning and provide rudimentary understanding that is necessary to explain

complex learning phenomena. Our research takes advantage of divergent adaptation to open water habitat versus near-shore habitat in Three-spined sticklebacks (Gasterosteus sp. complex). For benthic fish the complexity of their near-shore environment creates diverse associative challenges, for example, using discrete landmarks for navigation. For limentics, shoaling and thus social learning is crucial for obtaining food and for reduced predation.. Differences in habitat and selection have likely caused these differences. We plan to test the associative learning capacity of both species using an appetitive-conditioning paradigm in which a light stimulus precedes the dispensing of food. Fish will receive a food/light pairing four times per day seven days per week during the training period. Once an association has been made, one control will be subject to differing latencies between light and food presentation and the other will receive only the light stimulus. By doing this we hope to gain an improved understanding of basic learning phenomena.

POSTER PRESENTATIONS, SECTION 2
BALLROOM, 9:00-11:00 AM

A GRADUATE-UNDERGRADUATE SEMINAR ON THE SOILS OF SOUTHWESTERN MICHIGAN: IN THE FIELD, THE LAB AND USING A GIS
Marie Holler, Elin Thorlund
Category: Agriculture and Animal Science, Section 2
Poster: 9
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Randall Schaetzl (Geography)

Soils on many of the outwash plains in southwestern Michigan have loamy upper profiles, despite being underlain by coarse, sandy sediment. The purpose of this study is to analyze the spatio-textural characteristics of these loamy-textured sediments in southwestern Michigan, in order to ascertain their origin(s). The textural curves of this material have distinct bimodality, with clear silt and sand peaks. Because the sand peaks align with those in the outwash below, we concluded that the upper material has experienced pedoturbation, forming loamy textures from an initially siltier sediment. By applying a textural filtering operation to the data, we determined its original textural characteristics. Filtered data indicated that nearly all of the soils had silt loam upper profiles, typical for loess. Field data showed that the upper, loamy material is thickest slightly east of a large, broad, N-S trending valley (the Niles-Thornapple Spillway) that once carried glacial meltwater. The loamy sediment gets thinner, better sorted, and finer in texture moving east from this channel and toward the east. We conclude that the loamy mantle on many of the adjacent outwash plains is silt-rich loess that was derived from the Niles-Thornapple Spillway and its major tributary channels. The Spillway was active for approximately 500 years, between ca. 17.3 and 16.8 kcal. yrs ago. At this time, a large network of tunnel channels was forming beneath the stagnant Saginaw lobe. Meltwater from these channels mined the silt-rich Saginaw lobe till, funneling silt into the Spillway, making it a prodigious silt source.

EFFECTS OF OBSERVATION UNCERTAINTY ON HARVESTING RISKS FOR WILD TURKEYS
Sydney Manning
Category: Agriculture and Animal Science, Section 2
Poster: 11
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Bryan Stevens (Fisheries and Wildlife), David Williams (Fisheries and Wildlife)

Wild turkeys (Meleagris gallopavo) across North America are managed to maintain populations and sustain recreational harvests. Population models are used to determine harvest rates that allow for sustainable exploitation, yet uncertainties common to management create risks of overharvesting. Current models assume the exact population size is known prior to harvest, yet this assumption is never true; this condition is known as observation uncertainty. Without accounting for observation uncertainty the true risks of a given harvest rate are unknown, and the consequences of harvesting can be undesirable. Therefore, our objective was to evaluate the effects of observation uncertainty on harvesting risks for wild turkey populations. We used stochastic population and harvest simulations to evaluate harvest risks. We compared simulations with four different models of observation uncertainty: 1) no observation error, 2) unbiased estimates of spring population sizes, 3) constant proportional indices of spring populations, and 4) constant proportional indices of spring and fall population sizes. We demonstrate that harvesting using common population indices can result in greater risk of overharvesting turkey populations. This analysis demonstrates the importance of accounting for observation error when developing harvest simulations, and how harvesting risks for turkeys can be misjudged when key uncertainties are not considered. Moreover, this research shows that ongoing efforts to develop new methods for accurate abundance estimation will be directly beneficial to turkey management. This benefit will allow wildlife managers to make more informed decisions about target harvest rates for reaching local population objectives.

VARIATION OF UTERINE ENDOMETRIAL EPITHELIAL CELLS THROUGHOUT THE ESTROUS CYCLE IN WILD AND DOMESTIC CATS
Olivia Child

Category: Agriculture and Animal Science, Section 2
Poster: 12
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Dalen Agnew (Pathobiology and Diagnostic Investigation)

When examining microscopic samples of the feline uterus, an understanding of normal morphology is necessary to determine variations from normal. This is complicated because normal morphology of the uterus varies as hormone levels vary during the estrous cycle, otherwise known as the heat cycle. In the realm of felines, very few studies have been conducted to identify these important pieces of information from uterus samples. The goal of this project is to compare domestic cats in different stages of the estrous cycle by microscopically measuring the inner uterine lining (endometrial epithelial cells) seen in histologic cross-sections from the uteri of healthy cats which were spayed for population control. Using ImagePro® software, each cross-section slide will be examined to find the average epithelial height, which will then be compared to that of cats in the same and different stages of the estrous cycle. This will establish a reference which could be applicable to future studies not only with house cats, but also with larger felines, such as lions or tigers. In this poster presentation, the methods used to explore the variation in cat uteri will be visually displayed and the implications of the results will be discussed. The accurate determination of a cat's estrous stage will be extremely helpful in feline reproductive and contraceptive studies; in turn, this will improve our ability to manage and control the reproductive cycles of cats, both big and small.

DNA-BASED MARK-RECAPTURE ABUNDANCE ESTIMATE OF URBAN WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS) IN MERIDIAN TOWNSHIP, MICHIGAN, U.S.A.
Jennifer Hollen
Category: Agriculture and Animal Science, Section 2
Poster: 13
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): William Porter (Fisheries and Wildlife), Kim Scribner (Fisheries and Wildlife)

White-tailed deer populations have increased throughout the Eastern and Midwestern United States within the past several decades. This increase has led to human-deer conflicts in urban areas. To better manage these problems, accurate estimates of abundance for urban white-tailed deer populations are necessary. I hypothesized that mark-recapture using non-invasive DNA samples could be a reliable method for deer populations in urban areas. I used fecal pellets collected August – October 2013 from private and public lands in Meridian Township located in central Michigan, USA. I extracted DNA from 528 pellet groups and genotyped samples at 6 microsatellite loci using Polymerase Chain Reactions (PCR) and then visualized PCR products on a 6.5% acrylamide gel. Alleles were scored twice by 2 independent researchers to ensure consistent scoring. I calculated measures of genetic diversity including number of alleles, allele frequencies, and the average and expected heterozygosities for each locus. Then, I used the program GeneCap to identify individuals and a likelihood based single-sample estimator to estimate population size within the study area. My research suggests that microsatellite-based mark-recapture has the potential of being a reliable, cost-effective, non-invasive way to estimate deer population size. These results also will help guide management plans intended to reduce human-deer conflicts.

GROWING BIOFUELS IN MICHIGAN AND WISCONSIN: EXAMINING THE FACTORS IMPACTING LANDOWNERS' LAND USE DECISIONS
Michaela Palmer
Category: Agriculture and Animal Science, Section 2
Poster: 14
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Scott Swinton (Agricultural, Food and Resource Economics)

Due to increasing political controversy surrounding foreign oil, there has been an expansion of research surrounding alternative energy sources. Bioenergy, renewable energy made available from materials derived from biological sources, is being explored as a viable alternative to fossil fuels. In conjunction with the Department of Energy and The Great Lakes Bioenergy Research Center, researchers at Michigan State University and University of Wisconsin sent out a survey to approximately 2,000 landowners, who owned more than 10 acres, in the Michigan and Wisconsin area to determine landowner's thoughts on bioenergy and their willingness to grow biofuels, fuel derived from organic matter. The objective of my research is looking at what factors cause landowners to view cropland and forested land differently. I anticipate the results from my research will offer an explanation as to why survey participants were willing to grow biofuels on some types of land and not others. Methods involved in this research include investigating dependent variables, such as land type, that can affect how landowner's view their land. Comparing variables in the survey in common with those researched, I will then perform a regression analysis comparing the dependent variables against the casual variable of whether the survey participant said yes or no to growing biofuels. This analysis will show how different variables are able to affect people's decisions. Understanding the correlation between these variables is important because the ability to produce bioenergy is contingent on people's willingness to grow

biofuels on their property.

POSTER PRESENTATIONS, SECTION 3
MOSAIC MULTIPURPOSE ROOM, 1:00-3:00 PM

EVALUATION OF AMARANTHUS HYPOCHONDRIACUS GERMPLASM FOR LODGING AND SHATTER RESISTANCE TRAITS
Nicholas Boerman
Category: Agriculture and Animal Science, Section 3
Poster: 17
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mitch McGrath (Plant, Soil, and Microbial Sciences)

Cultivated by the Aztecs for its high quality grain, Amaranthus hypochondriacus is rich in protein, amino acids, and essential vitamins and minerals. A replicated field trial of several outstanding accessions from our germplasm to identify short statured plants that remain standing after seed set, emerge well and grow in dense stands was conducted. Thirty-two accessions were selected based on notes of the previous three years' plantings, as compared to the commercial variety Plainsman. The trial was conducted using a randomized complete block design. Eight accessions plus the Plainsman control were hand harvested after evaluation of lodging, shattering, height, and uniformity. Results indicate that there is statistical significance for lodging resistance when being compared to the Plainsman control also for shatter weights, statistical significance was shown at an alpha level of 0.05, indicating a higher rate of shattering for entry number 17 when compared to the other eight entry numbers. Entry 17 was selected for its short stature, lodging resistance and stand density. While the largest gains were in reduction of lodging, grain loss from shattering has shown little difference in overall yield within the advanced material as compared to Plainsman. Future work should consist of conducting more replicated trials on the material advanced, and the parental lines to further evaluate the lines for lodging and shatter resistance and possible germplasm release.

DOES BLACK CARBON AROMATICITY VARY WITH POSITION WITHIN A BURNED TREE?
Dominic Uhelski
Category: Agriculture and Animal Science, Section 3
Poster: 18
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Jessica Miesel (Forestry)

Black carbon (BC) is produced by the charring of biomass during forest fires; it has a unique chemical structure that is highly aromatic, which may make it more resistant to decomposition than other forms of organic matter. Our objective was to determine the mass and chemical composition of charred bark produced at different positions within a tree by a stand-replacing fire. We hypothesized that BC produced at the base of the tree will be more aromatic than BC produced at the top of trees, and that BC on outer fine branches of the tree crown will be less aromatic than BC on the main tree stem. To test these hypotheses, we collected five whole trees from a high severity prescribed burn in jack pine (Pinus banksiana Lamb.) forest, which took place on May 24, 2014. We removed the charred bark and preformed elemental analysis on the samples to determine ratios of carbon, hydrogen, nitrogen, and oxygen for the base and top of the stem and the outer branches. Preliminary results show that variability exists in the characteristics of BC produced during high-severity fire. Elemental ratios of charred bark collected <1.37 m above ground level were 0.43, 0.06, and <0.01 for H:C, O:C, and N:C, respectively. Differences in elemental ratios based on position within the tree will be presented. Understanding differences in BC chemical characteristics and the conditions of its formation is important because it has implications for soil and water quality as well as carbon storage.

TRACKING THE EFFECTS OF DIFFERENT FOOD RATIONS GROWTH AND REPRODUCTION ON INDIVIDUAL COMMON ENVIRONMENT-RAISED LAKE TROUT FROM DIFFERENT POPULATIONS: A 6 YEAR STUDY
Rachel Preuss
Category: Agriculture and Animal Science, Section 3
Poster: 19
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Cheryl Murphy (Fisheries and Wildlife)

Basic life history theory suggests that organisms allocate available energy to maximize lifetime reproductive success, and such allocations are based on the prevailing environmental conditions. We investigated whether four different lake trout stocks from very different environments would maintain the same energy allocation decisions as their wild counterparts when raised in a common environment. Reproductively mature, common-environment raised females were given different food rations and we monitored lipid levels in the body using a non-invasive fatmeter, along with measuring growth and egg production (size and number) for 6 years. Results suggest that lake trout from different stocks show different energy allocation patterns within the common environments and these allocations patterns change as the lake trout ages. Long lived fish show gradual increases in

egg production over time, while shorter lived fish maximize egg production at ages that are consistent with mortality schedules of wild fish. Egg size gradually increased as fish aged, and egg size was generally consistent with wild counterparts, but hatchery raised fish from longer lived stocks showed sensitivity to food rations. These results have implications for rehabilitation of lake trout populations in the Great Lakes using stocked fish.

ARE PORCINE EPIDEMIC DIARRHEA VIRUS (PEDV) EXPOSED GILTS AND SOWS FARROWING PROBLEMS IMPROVED BY VITAMIN E?
Roel Becerra
Category: Agriculture and Animal Science, Section 3
Poster: 20
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Gretchen Hill (Animal Science)

Porcine Epidemic Diarrhea Virus (PEDv) is a coronavirus that infects epithelia cells lining the small intestine of pigs. It is believed that sows exposed to PEDv have a longer farrowing duration and an increased number of stillborn pigs, especially in litters of greater than 10 piglets. Since vitamin E (E) is important in reducing oxidative stress and improving immunity, our objective was to determine if E increases survivability of offspring and reduces farrowing duration in PEDv exposed sows. Following confirmation of pregnancy, 91 PEDv exposed sows were injected with 5 ml of Vital E Repro or saline 7 days before farrowing. Sows were observed during farrowing and time of birth for each pig was recorded. Pigs were weighed at birth and weaning. Sow parity and body condition score did not differ between treatments ($P < 0.25$). Farrowing duration did not differ ($P = 0.86$) for sows injected with E vs. saline (201 vs. 205 min), respectively. Number of pigs born to sows injected with E was not different ($P = 0.43$) than those injected with saline (12.2 vs.12.8). Similarly, number of live births was not different (11.3 vs. 11.9, $P = 0.40$). Pigs born to sows injected with E grew faster than pigs from saline injected sows (21 day weight = 6.8 vs. 5.8 kg in E vs. saline, respectively, $P < 0.01$). This weight increase of 1 kg at weaning translates to decreased total days on feed and ultimately more money for the producer.

EVALUATION OF ACUTE TRANSPORTATION STRESS ON MEAT QUALITY OF PIGS
Haley Mae Danks, Nathan Bagnall, Sierra Bailey, Kara Ernst, Christopher France, Abigail Kalahar, Melody Marzjarani, Michael Rankin, Jason Sammut, Rhiannon Sehl
Category: Agriculture and Animal Science, Section 3
Poster: 21
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Catherine Ernst (Animal Science), Janice Siegford (Animal Science)

The main objective of the meat production industry is to produce the best quality of meat possible. This study explored how an acute transportation stress on living pigs affected meat quality after the pigs were slaughtered. The subjects of this study were castrated male pigs (n = 63). To assess the stress levels of the pigs, their salivary cortisol levels were measured. The salivary cortisol levels were taken twice: in home pens for baseline measure (pre-transport) and after transport to the slaughter facility (post-transport). At slaughter, measures of meat quality likely to be affected by stress were collected, such as pH, drip loss, and meat color. The lower the L* value, a measure of lightness of the longissimus muscle, the higher the meat quality. Lower drip loss, a measure of how much moisture muscle loses, is ideal. Ideal pH range is approximately 6.2-6.3. Mean cortisol level was significantly greater for the post-transport samples than the pre-transport samples (2239.97 ± 1935.78 pg/mL, 484.82 ± 388.47 pg/mL, respectively. $p = 0.002$). Mean drip loss was 0.0843 ± 0.0429 g, L* mean was 55.92 ± 3.77, and mean pH decline was 0.5805 ± 0.312. Transportation was therefore perceived as stressful by the pigs. Meat quality data was perceived as normal. Future analysis will relate cortisol levels to meat quality parameters to determine if the perceived stress translates to reduced meat quality.

MAPPING OF HEREDITY EQUINE REGIONAL DERMAL ASTHENIA
Miranda Rogers
Category: Agriculture and Animal Science, Section 3
Poster: 23
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Patrick Venta (Microbiology and Molecular Genetics)

Heredity Equine Regional Dermal Asthenia (HERDA) is an autosomal recessive disease in horses. The primary features are hyper-extendable joints and lesions due to loose or stretchy skin. This phenotype is similar to specific subtypes of Ehlers-Danlos Syndrome (EDS), a connective tissue disorder in humans caused by mutations in collagen genes. We hypothesized that HERDA is caused by mutations in one of the collagen genes analogous to those seen in EDS. To test this hypothesis, we are performing homozygosity mapping. We selected genetic markers near the collagen genes and performed PCR-based genotyping for each of the markers. Under the assumption that HERDA is caused by a Founder event, heterozygosity for the marker excludes a gene as being causative. A gene for which the associated marker is homozygous for the same allele across all affected horses is not

excluded and may be tested further to see if it is the causative gene. Locating the gene responsible for HERDA will allow a DNA-based test to be developed to allow horse breeders to avoid mating two carriers therefore decreasing the chance of having horses who are affected with HERDA.

ANTHROPOLOGY

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

MISSISSIPPIAN LANDSCAPES: A STUDY OF THE RELATIONSHIP BETWEEN NATURAL LANDSCAPES AND THE FORMATION AND MODIFICATION OF CULTURAL LANDSCAPES AT MAJOR MISSISSIPPIAN SITES, 800 TO 1300 CE
Joshua Schnell
Category: Anthropology, Section 1
Poster: 26
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Lynne Goldstein (Anthropology)

The Aztalan site sits on the banks of the Crawfish River in Jefferson County, Wisconsin. Excavations here have uncovered two distinct sculpted landscapes. Both features consist of deep storage pits dug into sand and gravel, and one of them shows evidence of being used for processing human remains. They are both similar in structure and placed at opposite and complementary corners of the site, something that is certainly not coincidence. This project was born out of a desire to investigate whether not what we are seeing at Aztalan in terms of these sculpted ritual landscapes is unique to the site or if it is similar or analogous to what we can learn about ritual and modified landscapes from other sites of similar size and structure. We are particularly interested in the presence and/or utilization of gravel at these other sites, something previously only associated with Aztalan. We have selected 12 other Mississippian sites of similar size and structure to Aztalan to investigate their natural and cultural landscapes. We are concerned with the soil makeup within a 5 mile radius of each site and the available water resources within a 2.5 mile radius of the site. This data was collected, organized into a workable database, and subjected to basic statistical analysis to reveal any similarities or differences in the landscapes of our sample. Future work for this project might involve turning this process into a model that can be applied to any collection of archaeological sites for landscape comparison.

3D SKULLS: A COMPARATIVE STUDY OF 3D MODEL GENERATION TECHNIQUES AND THEIR RELATIVE ACCURACY FOR DIGITAL CRANIAL OSTEOMETRY
Joshua Schnell
Category: Anthropology, Section 1
Poster: 27
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Gabriel Wrobel (Anthropology)

The recent proliferation of three-dimensional scanning devices and model generation techniques has made the use of 3D models in bioarchaeological research a reality. Despite the numerous applications of 3D modeling both in the field and in the lab, the existing body of research and published literature about constructing, analyzing, and sharing these models within archaeology is slim. The primary goal of this study is to test the accuracy of two of the most popular techniques for creating 3D models in regards to taking osteometric measurements from the models. A sample of crania was digitized using a NextEngine 3D Laser Scanner and 3D models were created with the accompanying ScanStudio HD software. The same crania were then modeled via photogrammetry (photo-stitching) using Agisoft PhotoScan software. Standard measurements were taken from each of the models after generation according to major osteometric cranial measurements and subsequently compared to results taken from the original crania using traditional osteometric instruments. We present the results of these comparisons and discuss the relative utility and efficiency of each technique.

DETERMINING SEX USING DISCRIMINATE FUNCTIONING OF THE HUMAN MANDIBLE
Taylor Flaherty
Category: Anthropology, Section 1
Poster: 28
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Gabriel Wrobel (Anthropology)

Using a small sample of mandibles from the Caesarea collection in the bioarchaeology lab at Michigan State University, discriminate functions have been developed with the data from predetermined measurements of various skeletal markers. All

measurements were taken with a standard Vernier Caliper. The individuals which were used were sexted based on the field notes and sex classifications given by previous archaeologists and handlers of the collection. The purpose of this study is to test whether the male and female mandibles have enough differentiating factors that they can indeed be used to determine the sex of both prehistoric and modern human remains.

PATHWAYS BETWEEN FOOD INSECURITY AND SERUM FOLATE STATUS THROUGH COPING STRATEGIES: A CASE STUDY AMONG BREASTFEEDING WOMEN IN DROUGHT STRICKEN NORTHERN KENYA
Allison Apland
Category: Anthropology, Section 1
Poster: 29
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Masako Fujita (Anthropology)

Food insecurity is a time of stress when people must use coping strategies to try and ameliorate hunger. These coping strategies help people survive, but can compromise dietary quality and micronutrient health. We hypothesized that folate health would be negatively impacted by coping strategies of food stretching, where energy dense food is favored over foods containing micronutrients such as folate. This study examines the hypothesized pathways from food insecurity to compromised folate status via coping strategies of sacrificing folate-rich foods (milk and beans), using 2006 data from breastfeeding Ariaal women experiencing droughts in Kenya. A food insecurity index was created from interview data on nutritious foods that were not physically or financially accessible to the women. Women missing milk or pulse in 24-hr dietary recalls were considered coping. Serum folate receptor (FOLR1) was assayed and used as a reverse marker of folate status, where high FOLR1 indicates low status. We created structural equation models using -ln(FOLR1) as the outcome and controlling for BMI and postpartum time. We found that food insecurity predicted sacrificed dairy intake and pulse intake. For the subsequent pathway, pulse was not predictive of folate status, but dairy was. These findings support our hypothesis because milk folate is highly bioavailable and would have a greater impact on folate status than folate found in pulses, which is less bioavailable, especially when cooked as is common in this community. Our findings indicate that improved access to milk is important to enhancing folate health in the face of food insecurity.

PATTERNS OF CHANGE
Kyla Cools
Category: Anthropology, Section 1
Poster: 30
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Marsha MacDowell (Art History and Visual Culture)

Traditional Native American craftwork is often distinguished by regional and tribal variations. Woven pieces, beadwork, and pottery specifically tend to have recognizable materials and patterns which distinguish work from one tribe to another. But do these tribal variations occur in more recent types of craftwork introduced through colonization? Native American quilts offer a valuable wealth of information with which to address this question. Quilts, as material evidence of social practices of sharing and replication, and as forms of memorialization, have the ability to illustrate cross-cultural contact and exchange. By utilizing Michigan State University's Great Lakes Quilt Center database-as well as the extensive North American Indian, Alaskan Native, and Native Hawaiian quilt collection at the Michigan State University Museum (formed beginning in the 1980s as part of a research and exhibition collaboration with the National Museum of the American Indian) -an analysis of patterns, geography, and purpose will be performed on roughly 130 samples to understand the nuances and variations present in Native American quilting. By mapping out where and why these quilts were made, pattern concentrations (and potentially additional concentrations such as color choices, sewing methods, etc.) will become visible. This will help further scholarly research in a variety of fields understand and recognize how aspects of cultural identity evolve, are represented, and maintained through quilting traditions.

BURNT TO A CRISP - USING CHARRED FOOD REMAINS ON POTTERY TO RECONSTRUCT THE PLANT DIET OF MIDDLE WOODLAND POPULATIONS IN MICHIGAN'S UPPER PENINSULA
Rebecca Albert
Category: Anthropology, Section 1
Poster: 31
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): William Lovis (Anthropology)

When there are limited macro-floral remains at an archaeological site, phytolith analysis can be used to analyze the burned food residue on sherds of pottery. The analysis reported here is being done on sherds from the Winter Site, in the Upper Peninsula of Michigan, to determine what kinds of plants the local populations were cooking 2000 years ago. Although phytolith analysis has been performed on many different assemblages in the United States, including Michigan, this is one of the first analyses of

phytoliths for early pottery from the Upper Peninsula. This analysis could give some insight into how early corn and rice was being instituted into the diets of native populations. After recording characteristics of the pottery and the locations of burned food remains, samples of charred material from 16 ceramic sherds were collected. The samples were processed using the digestion procedure designed by the Archaeometry Laboratory at the University of Minnesota – Duluth to digest any material other than phytoliths. The samples have not yet been analyzed; however potential outcomes are phytoliths of species including Zea Mays (corn), Chenopodium (goosefoot), Cucurbita (squash), Zizania (rice), and Fabaceae.

BIOCHEMISTRY & MOLECULAR BIOLOGY

ORAL PRESENTATIONS, SECTION 1
TOWER ROOM, 1:00-2:45 PM

REGULATED TURNOVER OF RETINOBLASTOMA PROTEIN: STRUCTURAL DETERMINANTS AND GOVERNANCE THROUGH PHOSPHORYLATION
Zachary Penrod
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 1:00 PM-1:15 PM
Mentor(s): William Henry (Biochemistry and Molecular Biology), Satyaki Sengupta (Biochemistry and Molecular Biology)

Deregulated proliferation of cells is a hallmark of human cancers. Tumor suppressor proteins tightly control cellular proliferation in normal cells. The Retinoblastoma (RB) family proteins exemplify one such kind of tumor suppressor. The first goal of our project is to identify the specific regions in RB proteins that target them for degradation. As phosphorylation of various other proteins has been shown to modulate their stability, we propose that phosphorylation events within the RB are key to its destruction. To this end, our second aim is to study the effects of phospho-mimetic and phospho-resistant mutations on RB family destruction. Lastly we are studying the role of p107 and p53 in response to DNA damage induced by exposure to UV light. Taken together these studies will help us in resolving the mechanisms that govern the function of this important tumor suppressor family in cancer.

MODULATION OF GENE EXPRESSION IN METABOLIC TISSUES BY DIETARY FATTY ACIDS
Emily Davidson
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 1:15 PM-1:30 PM
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)

Chronic inflammation is a risk factor for several chronic diseases. The polyunsaturated omega-3 fatty acids, docosapentaenoic acid (DHA) and eicosapentaenoic acid (EPA) have potent immunomodulatory properties. While the effects of EPA and DHA on markers of inflammation are well described in mouse models of disease, the effects of EPA and DHA on markers of inflammation in normal mice are poorly described. In this study, we sought to determine the effect of dietary omega-3 fatty acids on cytokine gene expression in fatty acid metabolic tissues: liver, muscle, and adipose. At five weeks of age, mice were placed on either a control or an EPA+DHA enriched fish oil diet and fed for 5 weeks. Mice were euthanized according to IACUC standard protocol and tissue was collected. RNA was extracted from mouse tissues using TRIzol. The resulting RNA was reverse transcribed to cDNA. Using quantitative-real-time PCR, TNFα, IL-1β, and IL-6 expression were analyzed. Gene expression was compared by delta delta CT method. Dietary fish oil enriched in DHA+EPA did not affect expression of TNF-α, IL-1β or IL-6 in the liver or adipose tissue. However, TNF-α gene expression increased in muscle. We had hypothesized that the expression of inflammatory cytokines would decrease in the dietary presence of fish oil enriched with DHA and EPA. On the contrary, we observed that dietary fish oil enriched with DHA+EPA did not reduce the expression of tissue cytokines in healthy mice.

PREBIOTIC PEPTIDES
Andrew Baker
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 1:30 PM-1:45 PM
Mentor(s): Robert Root-Berntein (Physiology)

Since Stanley Miller first demonstrated amino acids could be synthesized using primordial earth conditions, many people have hypothesized about the next step. How do these molecules come together to form peptides and proteins used in organisms today? Many authors have formed peptides under prebiotic conditions. They have used coupling reagents such as carbonyldiimidazole, carbonyl sulfide, and adenylates and clay (Hill 1996 and Leman 2004, and Paecht 1970) but these reagents were used in high concentrations, decomposed rapidly, or required very specific conditions. Rode and authors (1999) used a

simpler system to create peptides, comprised of copper chloride, sodium chloride, clays, and cycles of wetting and drying. However, these authors usually used binary systems, not exploring mixtures of many amino acids. In conjunction with peptide synthesis research, there are authors that have made self-replicating peptides (not prebiotically) (Lee 1996). What many of these self-replicating peptides have in common is that a template directs the elongation by stabilizing the reactants in the correct positions to react. This idea is carried out further in this study, creating peptides that bind to specific molecules. Using these molecules as a template to build the peptides on.

CHARACTERIZATION OF FUNCTIONAL SIRNA ASYMMETRY
Rebecca Carlson, Kwasi Adu Berchie
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 1:45 PM-2:00 PM
Mentor(s): S Patrick Walton (Chemical Engineering and Materials Science)

RNA interference (RNAi) is a native eukaryotic pathway through which small RNA molecules silence genes by degrading of complementary mRNAs. Leveraging what we know about the native mechanism we can design short interfering RNAs (siRNAs) to enact targeted gene silencing for therapeutic and research purposes. siRNAs enter the RNAi pathway as a double-stranded structure; one strand is selected by the pathway to form the RNA-Induced Silencing Complex (RISC) while the other strand is degraded. The mechanism by which strand selection occurs remains unsolved. We are developing two assays, one of which measures the relative activity of each strand within an siRNA using a chemiluminescent reporter system in cultured cells, while the other directly measures the amount of each siRNA strand incorporated into RISC via quantitative PCR. In particular, we are examining two variables we know to be highly predictive of siRNA activity: the relative terminal hybridization stability of the siRNA and its terminal nucleotide sequence. Our results indicate the relative activity of each strand of our chosen siRNAs, demonstrating which qualities determine the asymmetric character of siRNAs. By improving our understanding of the RNAi pathway and the selection of the guide strand, we will be able to design better siRNAs.

MUTANT FLIES: GENOME-WIDE EFFECTS OF RB MUTATION IN DROSOPHILA DEVELOPMENT
Irina Pushel
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 2:00 PM-2:15 PM
Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

The retinoblastoma (Rb) family of proteins plays an essential role in controlling cell growth and division. As transcriptional regulators, these proteins affect the expression of genes important for normal, healthy development. When mutated or misexpressed, Rb proteins can cause developmental abnormalities and diseases such as cancer. Using the fruit fly Drosophila melanogaster, we can begin to understand how a given mutation leads to these aberrant phenotypes. Previous work in the Arnosti lab characterizing Rb family proteins has established the effects of a number of mutations on the stability and activity of these proteins, as well as demonstrating their effects on several genes involved in the cell cycle and apoptosis. Using a system in which wild-type and mutated protein expression can be induced via heat shock, we can assess the downstream effects of mutation in fly development, including changes in gene expression, binding of Rb family proteins, and chromatin state on a genome-wide scale. By developing an understanding of the differences in function of wild type and mutated proteins, we gain a glimpse into what is happening in human cancers, and potential targets for the development of future therapies.

ENVIRONMENTAL EFFECTS ON FITNESS OF PHAGE LAMBDA
Rachel Sullivan
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 2:15 PM-2:30 PM
Mentor(s): Alita Burmeister (Microbiology and Molecular Genetics)

Bacteriophage were discovered 100 years ago this year, yet in that time almost all phage ecology has focused on the interactions with host cells, with very few studies investigating the relationship between phage their environment. As semelparous organisms, lytic phage reproduce only once, introducing vast numbers of offspring into the environment, and then die. However, most progeny will not successfully navigate their environment to access host cells and complete their life cycles. We propose that the extracellular environment produces a veritable asteroid field capable not only of stymieing phage, but also of inducing nonadaptive adsorption to cellular debris. To test this, we observed decay rates of phage Lambda over two weeks in environments with varying levels of phage-inhibiting cellular debris and shaking regimes in the absence of host cells. Our work will give insight into how the environment affects phage fitness, and our method will be useful in future work to assess genotype-by-environment interactions. These interactions will be particularly interesting in the context of phage evolution, where selection for increased host adsorption rate may result in increased rate of nonadaptive attachment to environmental debris.

ELUCIDATING THE MOLECULAR MECHANISM OF THE EGF-CFC FAMILY PROTEIN CRYPTIC

Jake Reske
Category: Biochemistry and Molecular Biology, Section 1
Location: Tower Room
Time: 2:30 PM-2:45 PM
Mentor(s): Erik Martinez-Hackert (Biochemistry and Molecular Biology)

The 223-residue peptide Cryptic is a member of the EGF-CFC family of proteins, known to play a role in transforming growth factor beta (TGFbeta) signaling as co-receptors. EGF-CFC proteins are a group of epidermal growth factors found in vertebrates that contain a homologous region specific to the family. Both of the members found in mammals, Cryptic and Cripto, have four distinct amino acid domain sequences, though there have been no finite connections about the roles of these domains' in vivo functionality. Current research involves designing mutant constructs of Cryptic to determine roles in binding of the various residue domains, and expression and purification of these mutant constructs in mammalian platforms. Gaining a more holistic understanding of biochemical mechanisms behind these interactions will facilitate the advancement of experimental approaches.

POSTER PRESENTATIONS, SECTION 1
LAKE HURON ROOM, 9:00-11:00 AM

HISTONE VARIATIONS IN HEMATOPOIETIC CELLS
Tyler Miksanek
Category: Biochemistry and Molecular Biology, Section 1
Poster: 34
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Monique Floer (Biochemistry)

For years, the genetic code written in our DNA was held to be the ultimate determinant of our physical traits. However, epigenetics, or the study of regulated changes of gene expression within the cell, has become crucial to our understanding of cellular development in recent years. Differential gene expression plays just as important a role within an organism as gene diversity does in a community of organisms. At the core of epigenetics is the role of chromatin, the intracellular agent that both packages DNA and determines epigenetic expression. Chromatin is comprised of histones, which are proteins that form complexes called nucleosomes within the cell. The percent of nucleosome occupancy in a specific region of a chromatin helps determine gene expression along that segment of DNA. Since epigenetic changes in nucleosomes and chromatin binding play a key role in cell differentiation within an organism, we can hypothesize that as cellular differentiation occurs, histone changes will result as well. My work attempts to quantify histone changes during cellular development in vitro using differentiated and undifferentiated hematopoietic Mus musculus cells.

THE EFFECT OF GLUCOSE CONCENTRATION IN STORAGE ENVIRONMENTS ON MEMBRANE PROTEIN EXPRESSION IN RED BLOOD CELLS
Laura Hesse
Category: Biochemistry and Molecular Biology, Section 1
Poster: 35
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Kristen Entwistle (Chemistry), Dana Spence (Chemistry)

Storage of red blood cells (RBCs) for use in transfusions is a process that is critical to modern medicine. The current method involves storing the RBCs in an additive solution (AS-1) that has a glucose concentration of 40 mM, nearly 10 times the glucose concentration in the blood of a healthy adult (4-6 mM glucose). Previous research from the Spence lab has shown that cells stored in high glucose environments release less ATP than cells stored in normoglycemic AS-1 (AS-1N, glucose concentration 5 mM). This project is exploring whether the glucose concentration of the storage environment also affects the proteins found in the cell membrane of the RBCs. ATP release has been linked with cystic fibrosis transmembrane conductance regulator (CFTR), one of the cell membrane proteins we will be measuring. Glucose transporter 1 (GLUT-1), the other protein included in our study, is responsible for transporting glucose across the cell membrane and into the cell. Blood will be drawn three different times from three different donors, then the RBCs will be stored in AS-1 and AS-1N solutions. Sodium dodecyl sulfate polyacrylamide gel electrophoresis and western blot techniques will be used to measure the GLUT-1 and CFTR levels in the stored blood over a 5 week period.

INVESTIGATING THE ROLE OF BACTERIOPHAGE TAILS IN HOST CELL ATTACHMENT
Sophia Sdao
Category: Biochemistry and Molecular Biology, Section 1
Poster: 36
Location: Lake Huron Room

Time: 9:00 AM-11:00 AM
Mentor(s): Kristin Parent (Biochemistry and Molecular Biology)

Bacteriophage attachment to the host is critical for infection. The phage P22 utilizes the lipopolysaccharide (LPS) of its host, Salmonella typhimurium to reversibly bind to the outer membrane. Similarly, bacteriophage Sf6 also binds reversibly to the LPS of its host, Shigella flexneri. Sf6 then uses the outer membrane protein A (OmpA) on Shigella flexneri as a secondary receptor to irreversibly bind to the host membrane. Conversely, not much is known about the phage proteins used to initiate attachment to the host receptors. This project seeks to analyze protein-protein interactions between tail needle proteins on bacteriophages SfF6 and P22 and OmpA, the known bacteriophage receptor of Sf6's host, Shigella flexneri.

REPURPOSING AN AMINOMUTASE FROM TAXUS PLANTS: STEREO- AND REGIOSELECTIVE AMINATION OF CINNAMATE EPOXIDES PRODUCES RING-OPENED ERYTHRO-PHENYLSERINES
Olivia Goethe
Category: Biochemistry and Molecular Biology, Section 1
Poster: 37
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Nishanka Dilini Ratnayake (Chemistry), Kevin Walker (Chemistry)

The antineoplastic, natural product paclitaxel has nineteen chiral centers. The stereochemistry of the phenylisoserine side chain of paclitaxel accounts for two stereocenters that are important for its efficacy. The side chain is derived from R-β-phenylalanine, the stereoselective product of an aminomutase (TcPAM) that isomerizes an S-α-phenylalanine substrate. Earlier studies showed that TcPAM functions as a transaminase and ring-opens cinnamate epoxides to erythro-phenylserines. Additionally, meta-substituted cinnamate epoxides with bromo-, chloro-, and nitro-substituents were tested as substrates for TcPAM using styrylalanine as the amino group source in the transamination reaction. LC-MS revealed masses that were predicted for aminated, ring-opened products. To solve the absolute stereochemistry of the biosynthetic phenylserines, we used the stereospecific L-threonine aldolase (from Escherichia coli) to assess the D- or L-stereoisomerism of the erythro-products. The aldolase cleaves the Cα-Cβ bond of a [2S, 3S] stereoisomer, producing benzaldehyde and glycine. Mass spectrometry will help discern which molecules are present before and after incubation with the aldolase. An authentic standard of a D/L-racemate of erythro-phenylsenine will be derivatized with a chiral auxiliary before and after treatment with the aldolase. The derivatized stereoisomer with a reduced peak intensity will help assign the erythro-L-isomer. The biosynthetic sample eluting at the same retention time and showing fragment ions identical to that of the L-stereoisomer in the standard would support the absolute stereochemistry of the erythro-phenylserine product as [2S, 3S].

REGULATION OF THE INSULIN RECEPTOR IN DROSOPHILA
Andrew Ingersoll
Category: Biochemistry and Molecular Biology, Section 1
Poster: 38
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

The Insulin/Insulin-like peptide Signaling (IIS) pathway is a central regulator of nutrient dependent growth in metazoans. In Drosophila melanogaster, the Insulin Receptor (Inr) protein binds to Insulin-like peptides and signals through the Insulin signaling pathway. Expression of Inr is crucial to signaling and is regulated by cis-regulatory elements (CRE) associated with the gene. The Retinoblastoma-like family protein (Rbf) has been shown to be associated with CREs upstream of Inr. In order to identify whether Rbf directly regulates Inr expression in vivo, we are using the CRISPR-Cas9 technology to generate transgenic flies lacking the Rbf binding sites. We injected specific guide RNAs targeting the Rbf binding region in embryos expressing Cas9. Screening of progeny will be carried out by PCR to identify mutant flies with mutations in the Rbf binding region. Our future studies will be focused on using these transgenic flies to study the phenotypic effect of a lack of Rbf regulation on Inr expression.

S. CEREVISIAE TOLERANCE OF REACTIVE OXYGEN SPECIES IN CO-CULTURE WITH S. ELONGATUS FOR BIOFUEL PRODUCTION
Jenna Chandler
Category: Biochemistry and Molecular Biology, Section 1
Poster: 39
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Daniel Ducat (Biochemistry and Molecular Biology)

A genetically engineered strain of cyanobacteria (Snyechococcus elongatus) has been modified to direct most of its carbon into secreting sucrose. This sucrose is utilized by S. cerevisiae to produce fatty alcohols, a carbohydrate feedstock of biofuels. As a result of its metabolism, cyanobacteria produce reactive oxygen species, namely hydrogen peroxide (H2O2), which is

detrimental to yeast survival. We are examining the tolerance of different yeast strains to H2O2, and exploring different approaches to increase yeast resistance to H2O2. We hypothesized that an evolved strain of S. cerevisiae will demonstrate a higher H2O2 tolerance relative to the parental line. We measured H2O2 tolerance of several S. cerevisiae strains with increasing concentrations of ascorbic acid and H2O2. Cell colony counts were taken to measure growth. We intend to investigate the effects of other antioxidants and enzymes with protective mechanisms against ROS. Furthermore, we will compare ROS tolerance amongst all three S. cerevisiae strains to determine which is the most robust. We expect the evolved strains, Evo1 and Evo2, to demonstrate the highest ROS tolerance. Growing a yeast strain in the presence of cyanobacteria will likely provide a selective pressure, favoring the survival of yeast strains with mutations conferring higher H2O2 tolerance. Selecting a yeast strain with the highest ROS tolerance will enable a more viable environment for the long-term co-culture of yeast and cyanobacteria. A more robust co-culture will allow us to pair the appropriate yeast strain to the sucrose-secreting cyanobacteria, ultimately improving the co-culture's production of carbohydrate feedstock.

LONG DISTANCE LIPID SIGNALING IN PLANTS
Michael O'Keefe
Category: Biochemistry and Molecular Biology, Section 1
Poster: 40
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Susanne Hoffmann-Benning (Biochemistry)

The plant phloem acts as a highway system in plants, facilitating transport of essential nutrients, photoassimilates, and other molecules. These compounds are transported as energy carriers or building blocks but can also serve as signaling molecules. The latter are essential for the plant to respond to environmental changes. One group of components that has not been studied closely is lipids and lipid binding proteins. They may function in a novel long distance signaling path through the phloem and elicit adaptive responses to stress conditions (such as drought) by changing the development of the plant. We are investigating the structure, function and localization of PLAFP (Phloem Lipid-Associated Binding Protein) to better understand this signaling mechanism and its effect on plant development. PLAFP is localized in the periphery of cells which, combined with its small size, suggests ability to move through plasmodesmata and into the phloem. PLAFP-overexpression affects root length. PLAFP transcription as well as Phosphatidic acid (PA) levels increase in response to osmotic stress and ABA. This suggests that PLAFP and PA act together in long distance (drought-) stress signaling through the phloem. I have developed models suggesting PLAFP binds PA, possibly along the whole length of the lipid, pointing to removal of PA from the membrane as a signaling molecule. Acknowledgements: BMB Research Fellowship Award Fall 2014 and CNS Undergraduate Research Support Scholarship Summer 2014 to Mo'K.; NSF grant #1144391 to SHB. Thank you to Dr. Michael Feig for modeling help.

CHARACTERIZATION OF THE LACTATE RACEMASE SYSTEM
Allison Brazeau
Category: Biochemistry and Molecular Biology, Section 1
Poster: 41
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Benoit Desguin (Biochemistry and Molecular Biology), Robert Hausinger (Biochemistry and Molecular Biology)

Stereochemical inversion of molecules is carried out by enzymes called racemases. Lactate racemase (Lar), in particular, is a racemase enzyme that catalyzes the inversion of D-lactate and L-lactate. Lactic acid is a common and important molecule that is produced by fermentation and found throughout many systems in prokaryotes and eukaryotes. The lacetate racemase system has yet to be adequately researched and characterized, one of the reasons being its sensitivity to oxidation. The aim of the research is to further characterize the system by observing the system in Lactobacillus plantarum, where this enzyme system is commonly found. Using in vivo and in vitro techniques, it was discovered that the lactate racemase system needs nickel in order to function, and that in order to activate the system, nickel must be delivered to the active site of the apo-enzyme by accessory proteins. It was discovered, using in silico analyses that this nickel-dependent system is found in multiple different prokaryotic species. Complete characterization of the lactate racemase system could show the importance of nickel-dependent enzymes in prokaryotes.

POSTER PRESENTATIONS, SECTION 2
LAKE HURON ROOM, 9:00-11:00 AM

MUTAGENESIS OF THE ESCHERICHIA COLI RNA POLYMERASE BRIDGE HELIX TO ALTER PROTEIN FUNCTIONALITY
Hailey Caudill
Category: Biochemistry and Molecular Biology, Section 2
Poster: 43
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Burton (Biochemistry)

RNA polymerase (RNAP) is an enzyme involved in gene expression and transcription of many organisms. Escherichia coli RNAP is comprised of four important subunits, α, β, β', and ω as well as an associated transcription factor, σ. The bridge helix domain, an alpha helix found between the two large β and β' subunits, has been observed to coordinate the movement of other domains, acting as a hinge. Mutations in the E. coli hinge sequence, GARKGL, directly affect cellular processes such as elongation and fidelity as the bridge helix is involved intimately with RNAP function. Site-directed mutations, specifically in the N-terminal hinge, have the potential to impact the flexibility of the hinge, which may alter various RNAP activities. For the purpose of this study the pVS10 vector which encodes the closely related E. coli RNAP was constructed due to the immense complexity of the RNAP structure. Various mutations, specifically focusing on mutations of the basic lysine residue, will be amplified via polymerase chain reaction as chosen by their ability to alter the flexibility of the hinge. Protein purification can be achieved through Ni-NTA column chromatography followed by heparin column chromatography, in which the final product is dialyzed. Fidelity and transcriptional elongation rates will then be assayed to examine the effects involved in the variation of hinge flexibility. Manipulation of specific hinge residues may alter various cellular functions or prevent gene expression entirely as the bacterial bridge helix plays a central role in RNAP activity.

GLUCOSE 6-PHOSPHATE TRANSPORT ACROSS THE CHLOROPLAST MEMBRANE
Alyssa Schreur
Category: Biochemistry and Molecular Biology, Section 2
Poster: 44
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Thomas Sharkey (Biochemistry and Molecular Biology), Sean Weise (Biochemistry and Molecular Biology)

During the day, triose phosphates are exported from the chloroplast to be used in sucrose synthesis and hexose phosphates are used within the chloroplast for starch synthesis. In C3 plants hexose phosphates, intermediates of both starch and sucrose synthesis, are not normally transported across the chloroplast membrane. However, in C3 Arabidopsis there are two glucose 6-phosphate/phosphate anti-porters in chloroplast membrane. We have over expressed GTP2, which is not normally expressed in green leaves. These over-expressing plants have higher starch accumulation in comparison to controls. From this, we hypothesize that glucose 6-phosphate is being imported from the cytosol, bypassing regulation by PGI to increase the amount of starch synthesized. Because we have disrupted the transport of intermediates of the syntheses of starch and sucrose, we may also have disrupted starch and sucrose partitioning. In order to study starch and sucrose partitioning, radio labeled CO2 was fed to plants at different rates of photosynthesis and the amount of label partitioned to starch or sucrose was determined.

PKC ACTIVATION LEADS TO INCREASED RGS2 PROTEIN LEVELS
Lauren Aschermann
Category: Biochemistry and Molecular Biology, Section 2
Poster: 45
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Richard Neubig (Pharmacology and Toxicology), Benita Sjogren (Pharmacology and Toxicology)

Regulator of G protein Signaling 2 (RGS2) is a member of a family of proteins that regulate G protein-coupled receptor (GPCR) mediated signaling by accelerating GTP hydrolysis on active Gα subunits. RGS2 has been indicated to play an important role in regulating cardiovascular function. RGS2-/- mice are hypertensive, are prone to heart failure and show increased responses to vasoconstrictors, such as Angiotensin II. Strategies to increase RGS2 protein levels could thus be a beneficial therapeutic strategy. More detailed information on how RGS2 protein levels are regulated would facilitate these drug discovery efforts. A previous high-throughput cell-based screen of natural product extracts identified Indolactam V (ILV), a known PKC activator, to selectively increase protein levels of RGS2. Utilizing the PathHunter ProLabel assay; a β-galactosidase complementation assay that measures relative protein levels, we found that ILV, as well as phorbol 12-myristate 13-acetate (PMA), selectively increase RGS2 protein levels in a time and concentration dependent manner. This effect was blocked by PKC inhibitors indicating a mechanism mediated by PKC. Stimulation of a Gq coupled receptor also results in an increase in RGS2 protein, indicating that this could be a novel feedback mechanism for Gq signaling. This study is continuing to dissect the mechanism by which PKC activation leads to increased RGS2 protein levels. Overall, these studies will lead to increased understanding of how RGS2 protein levels are regulated.

***IN VITRO* DYNAMIC DOSING OF *ESCHERICHIA COLI* WITH LEVOFLOXACIN USING A 3D PRINTED MICROFLUIDIC DEVICE CAPABLE OF GENERATING PHARMACOKINETIC (PK) CURVES**
Eric Walton
Category: Biochemistry and Molecular Biology, Section 2
Poster: 46
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Jayda E Meisel (Chemistry), Dana Spence (Chemistry)

The cost of developing one drug ($1.8 billion) has increased demand for an efficient dynamic (i.e. diffusion-based) *in vitro* pharmacokinetic (PK) model that simulates *in vivo* drug loading and clearance in the human body. Current pharmaceutical industry standards (e.g. hollow fiber reactor) utilize large amounts of media and limit access to sample. A 3D printed microfluidic device with cell culture inserts offers a less expensive model for generating PK curves with access to cells and has applications for studying antibiotic-resistant bacteria strains. This project demonstrates that such a device can be used in dynamic drug dosing of bacteria cultures. Liquid *Escherichia coli* cultures with a concentration of approximately 10^7 cells/mL were prepared from *E. coli* stock streaked onto lysogeny broth agar with kanamycin sulfate (50 μg/mL). Trans-well membrane inserts (0.2 or 0.4 μm) were placed into a 3D printed device, consisting of 0.5 mm x 0.5 mm channels, and loaded with purified bacteria. Levofloxacin stock solution (119 μM) was flowed through the device at 10 μL/min and was switched to buffer after 1 hour; a dose curve was generated from liquid chromatography-mass spectrometry measurements of 5 μL samples taken every 30 minutes. Bacteria viability was determined using standard plating methods and flow cytometry. C_{max} was 68 ± 7.1 μM for 0.2 microns and 20 ± 9.4 μM for 0.4 microns; standard plating suggested a complete kill for both samples. However, flow cytometry indicated that 25 ± 19% (0.2 μm) and 59 ± 12% (0.4 μm) of the samples remained alive.

GLYCATION OF INSULIN RECEPTOR FRAGMENTS UNDER HYPERGLYCEMIC CONDITIONS AND EFFECT ON INSULIN BINDING
Tyler Rhinesmith
Category: Biochemistry and Molecular Biology, Section 2
Poster: 47
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Robert Root-Bernstein (Physiology)

Glycation of insulin occurs at 20 mM glucose, a concentration seen in persons with hyperglycemia (Abdel-Wahab, et al. 1997). Glycated insulin has decreased efficacy in lowering blood glucose in animal models (O'Harte et al. 2000). This process has been proposed to be a contributing factor in the development of insulin resistance in patients with chronic high blood sugar (Song et al. 2012). However, the timeframe for significant glycation to occur—several hours to days—is not consistent with the life cycle of insulin, which is degraded within hours of synthesis. Recent evidence has suggested that glucose binds at millimolar affinity to regions of the insulin receptor similar to insulin in sequence (Root-Bernstein et al. 2010). Here, we show glycation of insulin-like fragments of the insulin receptor after incubation in 20 mM glucose for 24 hours. Longer incubation times resulted in greater extent of glycation, similar to previous studies on insulin (Farah et al. 2005). Affinity assays of insulin to the insulin receptor fragments were also performed, demonstrating that some glycated fragments bind glucose with much lower affinity than when unglycated. Because the insulin receptor remains in cell membranes for months, it is a better candidate for significant glycation over many hyperglycemic cycles in diabetics. Such structural alteration may impact the receptor function. Therefore, we suggest that glycation of the insulin receptor may be a causative factor in the occurrence of insulin resistance in diabetics.

ER TO CHLOROPLAST LIPID TRAFFICKING: AN IN VIVO PULSE CHASE STUDY
Austin Katona
Category: Biochemistry and Molecular Biology, Section 2
Poster: 48
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Christoph Benning (Biochemistry)

Lipids are essential molecules in plants as they provide energy storage, and are important building blocks of membranes. In plant cells, major membrane lipids are synthesized in both, the endoplasmic reticulum and chloroplasts. Despite the chloroplast having the ability to synthesize lipids, it is well known that many major chloroplast lipids are synthesized using precursors from the ER pathway. TGD proteins (named for the phenotype of accumulation of the oligogalactolipid, trigalactosyldiacylglycerol) have been well characterized and found to be involved in the transport of lipids into the chloroplast. It is unknown, however, which lipid species is transported. In Arabidopsis thaliana, the fatty acids γ-lineolic acid (GLA) and stearidonic acid (SDA), which both have a Δ6 double bond, are not found naturally in lipids. We use a Δ6 desaturase protein from a moss produced under the control of an ethanol-inducible promoter in Arabidopsis to label various lipids with the fatty acids GLA and SDA. By measuring the change in percentages of fatty acids with this extra double bond in individual lipids over time through analysis by gas chromatography, we are able to detect possible transport intermediates and determine which lipid species enter the chloroplast. This information is important for our understanding of the assembly of the photosynthetic membrane in plants and could have applications in food and biofuel production. More generally, the developed in vivo lipid tagging technology promises to be a useful tool for studying plant lipid dynamics.

THE ORIGINS OF LIFE
Andrew Baker, Tyler Rhinesmith
Category: Biochemistry and Molecular Biology, Section 2
Poster: 49
Location: Lake Huron Room

Time: 9:00 AM-11:00 AM
Mentor(s): Robert Root-Bernstein (Physiology)

In 1953 Miller first demonstrated that an apparatus simulating primordial earth conditions could synthesize important biomolecules (Bada 2013). From then onward research on the origin of life expanded and many similar experiments have been done. Most of which involved changing the gases used in the apparatus, or applying different energy sources such as UV light or heat (Fitz. et al 2007). Most of these changes have only produced amino acids and simple organic molecules (Fitz. et al 2007). In order to evoke new insights, we manipulated variables such as the salt content of the starting solution and the shape of the apparatus. Biomolecules were identified by qualitative tests such as paper chromatography and quantitative analyses such as GC-MS and LC-MS. Results have shown simple sugars, lipids, and amino acids synthesized together. In addition, alcohol and volatile compounds have been produced in adjacent parts of the apparatus. Further quantitative testing is needed to identify the alcohol, volatile compounds and possible nucleotides.

CONFIRMATION OF ALKBH1 DEFICIENT STRAINS IN HEK293 CELLS
Mario Aliaj
Category: Biochemistry and Molecular Biology, Section 2
Poster: 50
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Robert Hausinger (Microbiology and Molecular Genetics), Tina Mueller (Microbiology and Molecular Genetics)

The human protein Alkbh1 is one of nine mammalian homologs of the *Escherichia coli* AlkB protein. AlkB is involved in direct DNA repair and removes alkylation damage on DNA bases. Alkbh1 possesses two enzymatic activities *in vitro*: it demethylates 3-methyl cytosine in single-stranded DNA and cleaves DNA at apurinic/apyrimidinic sites. In order to study Alkbh1's cellular role *in vivo*, HEK293 cells lacking Alkbh1 protein were created by deleting exons 1, 3, or 6 using the CRISPR/Cas9 method. In order to confirm the *alkbh1*$^{-/-}$ genotype, we utilized two different approaches. First, our immunoblot confirmed that the protein was not expressed. Second, we isolated genomic DNA, amplified specific exons, cloned the fragments, and verified the frame shift by sequencing. To conclude, HEK293 cells with a deletion in exon 1, 3, or 6 of *alkbh1* were confirmed successfully. Exposing the wild-type and Alkbh1-deficient cells to DNA damaging agents will hopefully help us deduce its role in mammalian cells in the future.

POSTER PRESENTATIONS, SECTION 3
MOSAIC MULTIPURPOSE ROOM, 1:00-3:00 PM

PLIN2 ABLATION PROTECTS AGAINST HIGH CARBOHYDRATE DIET-INDUCED OBESITY
Mohammad Aljazi
Category: Biochemistry and Molecular Biology, Section 3
Poster: 52
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Barbara Atshaves (Biochemistry)

When chronic over-nutrition occurs, excess lipids are stored in lipid droplets, unique organelles composed of a phospholipid monolayer and a neutral lipid core. Lipid droplets have been linked to several diseases including obesity and type II diabetes. However, while a link between excess lipids and aberrant glucose metabolism has been recognized, little is known regarding the role lipid droplets and their associated proteins including Perilipin 2 (Plin2), play in the progression of these diseases. In the current study Plin2 ablated and wild type mice were challenged with a high carbohydrate diet (HCD) for four weeks. Mice on the HCD exhibited elevated levels of fat tissue mass, increased body weight, and increased liver weight, but these effects were blunted in the Plin2 null mice. Additionally, histology showed evidence of hepatic steatosis and elevated insulin levels in HCD fed wild type mice, but ablation of Plin2 reduced hepatic steatosis and resulted in little to no change in insulin levels. Taken together, these results indicate Plin2 ablation alleviates HCD-induced obesity and improves insulin sensitivity when excess lipids are present.

THE EFFECTS OF ACTIVATION CONDITIONS ON THE SOLUBLE UREASE ACCESSORY PROTEIN COMPLEX
Evan Hsueh
Category: Biochemistry and Molecular Biology, Section 3
Poster: 53
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Robert Hausinger (Biochemistry and Molecular Biology)

Urease is a nickel-metalloenzyme with implications in medicine and agriculture. Studies using the model urease system from Klebsiella aerogenes identified a several accessory proteins (UreD, UreF, UreG, and UreE) that are required for the proper insertion of nickel into the active site in a GTP-dependent manner. A stable, soluble accessory protein complex containing a

maltose-binding protein UreD fusion (MBP-UreD), UreF, and UreG (MBP-UreDFG) has been identified but it was unknown what effect activation conditions would have on the stability of the complex in the absence of urease. Using affinity pull-down and size exclusion chromatography, it was found that UreG separated away from the MBP-UreDFG complex in the presence of nickel, with the expulsion enhanced with the addition of GTP and Mg2+. Removing Mg2+ from the reaction resulted in decreased UreG separation. Size-exclusion analysis of the quaternary state of UreG ejected from the complex revealed it as a dimer, while purified UreG is known to exist as a monomer. These results have strengthened our understanding of how these accessory proteins interact during in the presence of urease activation conditions independent of urease.

BIOINFORMATIC ANALYSIS OF GENE REGULATION BY RETINOBLASTOMA IN DROSOPHILA MELANOGASTER DURING DEVELOPMENT
Allison Gennety
Category: Biochemistry and Molecular Biology, Section 3
Poster: 54
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

Retinoblastoma (Rb) is a tumor corepressor which plays important roles in various cellular processes including proliferation, differentiation and apoptosis. Rb mutations have been associated with various human cancers. Previous studies have identified a region in the C-terminus of RBF1, the drosophila Rb homolog, termed the “instability element” (IE) which is important for RBF1 stability as well as repression activity. Misexpression of RBF1- ΔIE in wing imaginal discs of flies results in increased adult wing size and inhibition of apoptosis, whereas misexpression of K774A-RBF1 (point mutation within the IE) results in very small distorted wings with abnormal morphology and increased apoptosis. RNA-seq was performed to study gene regulation after overexpression of RBF1-WT, RBF1- ΔIE and K774A-RBF1 in wing imaginal discs. Results show significant differences in gene regulation by the three RBF1 isoforms. Bioinformatic analysis is being conducted to identify motif enrichments in differentially regulated genes which aims to understand the function of RBF1 and the instability element at a molecular level.

OMEGA-3 AND OMEGA-6 FATTY ACIDS ARE ASSOCIATED WITH PRO- AND ANTI-INFLAMMATORY CYTOKINES
Karen Matsuo
Category: Biochemistry and Molecular Biology, Section 3
Poster: 56
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)

Chronic low-grade inflammation is associated with several chronic diseases including cardiovascular disease and obesity. Inflammatory responses are mediated by signaling molecules such as lipids and cytokines. Specifically, polyunsaturated fatty acids (PUFAs) are ligands for cells and nuclear receptors to control inflammatory cytokine production. Humans lack the ability to biosynthesize omega-3 and omega-6 essential PUFAs. The ratio of omega-3 and omega-6 fatty acids has been a frequent topic of research. The disproportionate ratio of PUFAs is associated with chronic inflammatory diseases, with omega-3s being considered anti-inflammatory and omega-6s being pro-inflammatory. Our hypothesis is PUFAs in human plasma are associated with changes in pro- and anti-inflammatory cytokine presence. The study population consisted of 126 healthy Caucasian males between 48 and 65 years of age. Plasma samples were stored at -80 degrees Celsius until analysis. PUFAs were analyzed as fatty acid methyl esters (FAMEs) by gas chromatography, after modified Rose and Folch lipid extraction and acidified methyl esterification to form FAMEs. A multiplexed bead array kit was used to quantify plasma cytokines. Using Pearson correlations and polytomous logistic regressions, we expected to identify associations between cytokine tertiles and PUFAs in human plasma. In our results, anti-inflammatory cytokines IFN-λ and IL-10 were actually correlated with higher odds of certain omega-6s (AA, linoelaidic, GLA). In pro-inflammatory cytokines, higher levels of MIP-1α had a significantly higher n6n3 ratio. Establishing and understanding the links between significant PUFAs and cytokines will lead to a better understanding of PUFAs and inflammation.

COMPREHENSIVE ANALYSIS OF INSULIN SIGNALING IN DROSOPHILA MELANOGASTER
Kelly Montgomery
Category: Biochemistry and Molecular Biology, Section 3
Poster: 57
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

Insulin signaling is vital for regulating critical cellular energy functions such as glucose and lipid metabolism. Insulin elicits a diverse array of biological responses by binding to its specific receptor, the insulin receptor (InR). Improperly regulated insulin signaling can facilitate numerous human diseases including cancer and diabetes. Using Drosophila melanogaster as a model system, we study the transcriptional regulation of InR to comprehensively survey the cis-regulatory elements responsible for inducing gene expression in-vitro. Understanding the influence of regulatory elements on the activation and repression of D.

melanogaster InR (DInR) will provide greater insights into eukaryotic gene regulation and gene maintenance in correlation to human disease. Previously studies in the Arnosti lab have shown InR to differentially interact with elements critical for maintaining reproduction, metabolism, and immunity (FOXO and Ecdysone) in a cell-type specific manner. The aim of the project is to elucidate the internal elements vital for 20E and FOXO induced gene expression. Utilizing site-directed mutagenesis, I have developed a knockout mutant library of InR to comprehensively survey its functional modulators. Additionally, I study the effects of caffeine, the most widely consumed xenobiotic, on gene expression.

BUSINESS

ORAL PRESENTATIONS, SECTION 1
LAKE MICHIGAN ROOM, 9:00-10:15 AM

STUDENT MINDSET OF SERVICE MANAGEMENT: A TWO PHASE STUDY IN THE UNDERGRADUATE CLASSROOM
Ryan Hemingsen
Category: Business, Section 1
Location: Lake Michigan Room
Time: 9:00 AM-9:15 AM
Mentor(s): Mi Ran Kim (Hospitality Business)

The hospitality industry is distinct from other industries. It is labor-intensive, and the quality of services and products depends upon employees' quality of service and efficiency. In order to meet the various needs of the hospitality industry and to be successful managers in the future, hospitality education is a critical part in any aspiring hospitality business professional's career. The primary objective of this study is twofold: (1) to understand hospitality students' perception on the definition of service management, and (2) to identify the differences, changes, and effect of the service management course on the students' perceptions in understanding of the term "service management." An exploratory qualitative study was conducted and a paper survey was distributed to hospitality students who were taking a service management course at Michigan State university during Fall semester of 2014. In this study, a two phase (Phase 1: in the beginning of the course, Phase 2: in the end of the course) study was designed and in each phase, the students were asked to answer the same question: "what is your own definition of service management?" Results of this study show that there was a significant shift between the two data sets. From the first set of data, words like "management," "oversight," and "satisfaction" were often used, while for the second data set, we found more words such as "raving fans," "internal and external customers," and "memorable experiences." This study can provide great insights for hospitality educators in developing curriculum programs.

THE MOBILE E-COMMERCE LIFE CYCLE
Christopher Ryan
Category: Business, Section 1
Location: Lake Michigan Room
Time: 9:15 AM-9:30 AM
Mentor(s): Chen Lin (Marketing)

Commerce has changed indefinitely over the past two decades. With the rise of the internet and eventually mobile platforms, our methods of purchase and review have dramatically changed. This project will dive into the mobile e-commerce life cycle, including key parts, "The Set-Up", "The Move", "The Push", "The Play", "The Wrap" and "The Takeaway".

MONETARY POLICY & THE FOMC
James McKillop
Category: Business, Section 1
Location: Lake Michigan Room
Time: 9:30 AM-9:45 AM
Mentor(s): Hayong Yun (Finance)

A examination of past, present, and future economic issues related to the FOMC and their direction with Monetary Policy. Using historical and contemporary analysis of the economy and capital markets, we seek a suggestion as to what monetary policy is appropriate in the present and going forward.

EXAMINING FACTORS TO INFLUENCE RESTAURANT TIPPING BEHAVIORS: A PILOT STUDY
Allison Kubek, Emily Mielke
Category: Business, Section 1
Location: Lake Michigan Room
Time: 9:45 AM-10:00 AM
Mentor(s): JaeMin Cha (Hospitality Business), Seung Kim (Hospitality Business)

The practice of paying for gratuities of services is a widely-adopted custom in many parts of the world. In particular, tipping

servers a post-meal gratuity has become a salient element of the restaurant industry. Much research has been conducted about specific factors that may drive customer tipping behavior. These factors include both server-driven behaviors and environment influences outside of the servers' control. The main purpose of this study is to examine what specific servers' behaviors influence restaurant diners' tipping behaviors. In particular, we are interested in discovering the impact of various methods of suggestive selling on diners' tipping behaviors. We propose to employ an online survey, targeting different age groups, to collect the data. In addition to the scenario-based and Likert scales, the online survey also would include the open-ended questions to explore other specific servers' specific behaviors. We hope that the findings of our study are utilized for training service staff and increasing the restaurant performance.

BAND SUCCESS & STATUS INEQUALITY
Manny Alalouf
Category: Business, Section 1
Location: Lake Michigan Room
Time: 10:00 AM-10:15 AM
Mentor(s): Nicholas Hays (Finance)

The success of a band has much to do with the talent of the members within it. Sometimes, however, the longevity of the band's success can be disrupted by disputes among the members. Certain bands show a higher likelihood of disruption, and through our research we will attempt to illustrate that a common theme lies among the bands that falter. Just as in any team, if the status among the team members is unequal, disputes arise. Through queries that determine the relative popularity of each band member, and cross-references with album sales data, tour longevity data, and overall success of the band, we should be able to determine the correlation between status inequality of the members within the bands and their potential likelihood of success.

POSTER PRESENTATIONS, SECTION 1
THIRD FLOOR HALLWAY, 9:00-11:00 AM

HOW SUPPLY CHAIN KPI'S PREDICT AFFECT BANKRUPTCY OUTCOMES
Jason Chen
Category: Business, Section 1
Poster: 61
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Sriram Narayanan (Supply Chain)

Companies and businesses are always analyzing different Supply Chain Key Performance Indicators (KPI) to improve efficiencies. This is especially true when it comes to companies facing bankruptcy, more specifically chapter 11 bankruptcy. Under chapter 11 bankruptcy, firms must appropriate assets and liabilities to make their company look more profitable to investors. Many different things can happen when a company enters chapter 11 bankruptcy. Most companies emerge with no issue, some companies become acquired and some businesses will collapse. What this article will investigate is if there is any correlation between a company that emerges or closes from chapter 11 bankruptcy with different supply chain indicators. Through this investigation, business owners of companies that are in financial distress can understand the importance of different supply chain aspects and can predict what could potentially happen to a business facing bankruptcy.

UNDERSTANDING DRIVERS & BOUNDARIES OF FIRM-CONSUMER RELATIONSHIPS
Megan McKee
Category: Business, Section 1
Poster: 62
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Stephanie Mangus (Marketing)

In an era where customer satisfaction with firms is declining (ACSI 2014) and customer complaints are at an all-time high (Freeman 2013), firms are increasingly interested in exploring ways to develop and maintain long-term relationships with consumers. Such positive relationships between firms and consumers are crucial to generating customer loyalty, improving firm performance outcomes, and facilitating customer retention (Dwyer, Schurr and Oh 1987; Palmatier 2008). To investigate how consumers form relationships with firms, this research explores specifically relationships that consumers develop with firms, representatives of the firm (salespeople or frontline employees), and brands. Of further importance to this area of research is how consumers form relationships with each of these entities. To explore these issues, 11 in-depth interviews were conducted with consumers and analyzed using a hermeneutical phenomenological approach (Hirschman 1992). This process allows for the evaluation of different relationship types, the boundaries of such relationships, and the outcomes of such relationships for the consumer and the firm. This study has managerial implications for firms aiming to develop optimum relationship with consumers such that understanding the propensity an individual has toward creating relationships with other people or

organizations could prove vital in understanding how firms can improve customer satisfaction, brand loyalty, organizational commitment, and other important firm outcomes.

WALL STREET VS. THE WORLD: THE BATTLE BETWEEN RISK & REWARD
Brian L'Heureux, Wenwen Jia, Kari Jurewicz, Quin Wetzel, Lili Zhou
Category: Business, Section 1
Poster: 63
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Kirt Butler (Finance), Antoinette Tessmer (Finance)

While Wall Street dominates financial headlines and attracts millions of American investments, beyond the borders stand over a dozen other leading stock markets. The global market is comprised of approximately seventy percent of international stocks, leaving seemingly endless opportunities to diversify a portfolio. Some of the largest steel, electronics, and consumer appliance companies are based in foreign countries. However, with opportunity comes risks. These risks can include currency exchange risk, increased international volatility, and less available information. These aspects can deter investors away from international stock markets. But when done well, international investing can add another layer of diversification to a portfolio, increasing reward simultaneously. This project examines student's portfolios from Stocktrak, an online stock market simulator. The objective is to weigh the risks and opportunities of investing purely internationally, in domestic stocks of foreign companies, or in solely domestic stocks to conclude which provides the highest reward to risk ratio in a portfolio.

TRADING FREQUENCY, TRANSACTION COSTS, AND MARKET RETURNS
Scott Haeck, Runzhi Chen, Graham Dowling, Hannah McDowell, Chris Safroniy
Category: Business, Section 1
Poster: 64
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Kurt Butler (Finance), Antoinette Tessmer (Finance)

Our research addresses the question of how best to deploy resources on the financial market in order to generate return as efficiently as possible. Specifically, we explore the effect of the frequency with which assets are traded on the success of novice investors' portfolios to determine the optimal strategy at various levels of transaction costs available to investors with low-value portfolios. As one of the most potentially lucrative means of investment, the stock market is critical to personal and overall economic growth. Developing and implementing a market stratagem which minimizes risk and maximizes return is thus a central question in the realm of finance, relevant to casual investors and Wall Street professionals alike. Using simulated portfolios assembled by our small class of Honors' College freshmen and sophomores, we collected transaction history and daily returns over a period of several months on a market with no stated transaction costs. In our presentation, we will show the relationship between transaction frequency and return (both overall and relative to the market) in the aforementioned portfolios with varying transactions costs.

STUDY OF INVESTMENT RISK BY GENDER
Sarah Wrase, Cameron Anderson, Tyler Beck, Jake Ishbia, Erin Mayer
Category: Business, Section 1
Poster: 65
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Kirt Butler (Finance), Antoinette Tessmer (Finance)

Of all the Fortune 500 companies, just 11.4% of them have women as their CFOs. Women make up only 17.6% of executive officers in the finance and insurance industries. The gender gap in Michigan State University's Broad College of Business is somewhat less stark, but a 20% disparity still exists, with men making up nearly 60% of the College. The focus of our project is to examine the relative willingness to take risks in the stock market based on gender, to determine if men or women are naturally more risky than the other, and if this natural sense of risk affects those who choose to pursue jobs in Finance. To make this analysis we examine our UGS 200H class. This seminar focused on stock portfolio diversification. In the seminar, each student managed a portfolio with the goal of minimizing risk. The percentage of men to women in this class is nearly equal, 53% men and 47% women. To do this, we study the total risk held in each student's portfolio and their level of company and market risk. We also analyze the manner in which students of each gender reacted to short-term gains and losses in the S&P 500 in regard to their own trading and portfolio management.

TECHNOLOGY AND THE STOCK MARKET
Joseph Burzych
Category: Business, Section 1
Poster: 66
Location: Third Floor Hallway

Time: 9:00 AM-11:00 AM
Mentor(s): Geoffrey Booth (Finance)

My research project is about how the advances in technology, specifically the invention of the telephone, affected the stock market. I am trying to answer questions such as: What parts of the stock market changed as a result of the telephone? What new investing strategies were born? How did the markets and investors react to this more efficient way of communication? Why does it matter? And how have these effects resonated throughout history?

IMPACT OF OPERATIONAL COMPLEXITY ON PERFORMANCE IN THE AUTOMOTIVE INDUSTRY
Erika Burdt
Category: Business, Section 1
Poster: 67
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Sriram Narayanan (Supply Chain Management), Claudia Rosales (Supply Chain Management)

Our research for this project began with collecting an immense amount of data for automotive firms from different countries around the globe. This project illustrates how firms have a complex supply base and examines its impact on their supply chain and financial performance. We studied the impact of product variety, supplier base diversity, customer diversity, process quality, and environmental competence on supply chain and financial performance metrics for the top automotive component suppliers. Product variety in this research is captured as the number of products, supply base diversity is conceptualized as the number of suppliers, and customer base diversity is captured as the number of customers among other variables. A key operational performance dimension is the inventory turns of these companies. Inventory turns indicate how fast the firm turns around the goods it carries. Additionally, we researched the significance of various manufacturing related certifications and evaluated how they impact business practices and financial standing of companies. In terms of financial performance, we analyzed profit in terms of return on assets. Overall, we considered an array of factors in this project and tied all the data together to understand the complex supply chains that allow the automotive industry to function on a global scale.

POSTER PRESENTATIONS, SECTION 2
THIRD FLOOR HALLWAY, 1:00-3:00 PM

COAL ASH DISCLOSURE
Christopher DelBene
Category: Business, Section 2
Poster: 70
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Elizabeth Connors (Accounting and Information Systems)

This research looks at the relationship between the number of coal ash pits that energy companies have, what they disclose about them, and the possible effect on their stock prices. This project utilizes the companies' environmental reports, coal ash data retrieved from the EPA and Earthjustice, and historical data on stock prices from Yahoo! Finance. This study will help reveal any correlations to how and/or if proper and sufficient disclosure about coal ash affects investors' decision making in investing.

LUXURY CUSTOMER
Madeline Pappas
Category: Business, Section 2
Poster: 71
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): MiRan Kim (Hospitality Business)

In today's market a drastic increase in luxury products and services have been observed. The consumption of luxury brands has been influenced by a numerous macro-environmental trends, such as globalization and cultural convergence (Chadha and Husband, 2006); the emergence of new market segments (Okonkwo, 2009); a consistent rise in the number of wealthy consumers, and the increasing attention that luxury brands receive from the media (Mandel et al., 2006). All of these factors have raised the level of competition along with consumer awareness of available options. What makes a guest choose one hotel over another? Furthermore how does branding play a key role in this? In the hotel industry, a brands personality serves as the focal point for developing loyalty amongst customers and enhancing reputation. More importantly, it can help with relational ties, consisting of social benefits, trust and loyalty (Sung, Kim, & Jung, 2009). Based on Aaker's (1997) five brand personality dimensions (sincerity, excitement, competence, sophistication, and ruggedness), the purpose of this study is 1) to examine two new dimensions of brand personality (exclusivity, innovativeness), and 2) to explore the impact of brand personality dimensions

(exclusivity, innovativeness, sincerity, excitement, competence, and sophistication) in the luxury hotel context. The target market for the survey will be luxury hotel customers. This study can make valuable contributions to brand managers who may apply the findings to develop more competitive brand strategies by better understanding of brand personality of luxury hotels.

INVESTIGATING THE EFFECT OF COFFEE SHOP BRAND EXPERIENCE ON BRAND LOYALTY
Qi Huang
Category: Business, Section 2
Poster: 72
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Seung Hyun Kim (Hospitality Business)

This study is to examine the effect of brand experience on brand loyalty in context of coffee shop brand. Data will be collected from an online survey targeting college students. Brand experience scales were adopted from general service studies and be evaluated across two samples from US and Chinese students. Especially, this study applies to two specific brands: Starbucks and Biggby, and tests whether brand loyalty is influenced by brand experience factors.

NARCISSISM OF CEOS AND IT'S EFFECT ON COMPANY PERFORMANCE
Amanda Saad
Category: Business, Section 2
Poster: 73
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Ranjani Krishnan (Accounting)

My study was a test to see if a CEO's level of narcissism effected how a company performed. Narcissism is a personality trait that has been noted throughout all history. From the origin of the word, the Greek myth of Narcissus, to the study of the literature element hubris, studied in many literature classes, narcissism effects many lives. This study is important because the results could lead to inspiring changes in corporate environment to promote better performance of the company as a whole. I measured the level of narcissism by evaluating the presence of the CEO's picture in the annual reports. For each year the CEO was given a score of 1-4: four points were given if the CEO's photo was them alone and took up more than half a page; three points if the photo was of them alone and took up less than half a page; two points if the CEO was photographed with one or more fellow executives; and one point if there was no photo of the CEO. The performance was measured using Retained Earnings shown in the financial statements and the calculated working capital. I will be presenting on my findings of the correlation between narcissism of the CEO and company performance, along with my interpretation of the results.

RESHORING AMERICAN MANUFACTURING
Chase Skinner
Category: Business, Section 2
Poster: 74
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Tobias Schoenherr (Supply Chain Management)

"Reshoring" refers to the relocation of manufacturing facilities and thus jobs, which were once offshored to foreign countries, to another country; this can often mean the relocation back to the home country ("homeshoring") or to a country closer in proximity ("near-shoring"). This study aims to analyze whether there is a real trend of skilled manufacturing jobs being reshored to American soil, or whether a few success stories are creating false optimism throughout the manufacturing industry and U.S. economy. The primary method of analysis used in this research is reviewing articles from *The Reshoring Initiative* website and finding commonalities among articles to derive an overall view of reshoring. While conducting the research, specific note was taken on the following categorizations and measures: reasons for reshoring, number of jobs returning, industry, specific company, and the locations jobs are moving to and from. After reviewing hundreds of articles, there are a few conclusions that can be made. American manufacturing is growing and reshoring is certainly occurring in many instances, however offshoring is still occurring. That being said, the trade deficit is improving; additionally, various factors are making the U.S. economy a more favorable location for manufacturing for many industries.

THE QUEST FOR CITATIONS: DRIVERS OF ARTICLE IMPACT IN SUPPLY CHAIN MANAGEMENT RESEARCH
Ashley Menning
Category: Business, Section 2
Poster: 75
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Tobias Schoenherr (Supply Chain Management)

The number of citations (i.e. how often a research article published is referred to in subsequent articles) is becoming an increasingly popular index for measuring the impact of a scholar's research or the quality of an academic department. One obvious question is: what are the factors that influence the number of citations that a paper receives? This study investigates the number of citations received by papers published in well-known supply chain management journals. It considers factors that relate to the author(s), the article itself, and the journal. Overall, this study will provide some insights into the determinants of a paper's impact.

CELL BIOLOGY, GENETICS & GENOMICS

POSTER PRESENTATIONS, SECTION 1
MOSAIC MULTIPURPOSE ROOM, 9:00-11:00 AM

SEX IDENTIFICATION USING ZINC FINGER INTRONS ON THE X AND Y CHROMOSOMES
Alexander Samborski
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 79
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Joanne Crawford (Fisheries and Wildlife), Kim Scribner (Fisheries and Wildlife)

White-tailed deer thrive in urban settings. Increasing deer populations are leading to an increased potential for deer-human conflicts. While most deer-human conflicts result in deer mortality or injury, incidents such as car accidents and agricultural disruption have a negative impact on human lifestyles as well. In order to minimize or mitigate the conflicts between deer and humans it is important to understand deer population structure. A first step to understanding structure is the reliable estimation of sex ratios. I used molecular markers to assign sex to DNA samples and estimate the sex ratio of an urban deer population. Specifically, I used DNA extracted from fecal pellets collected during August – October 2013 in Meridian Township located in central Michigan, USA. I amplified zinc-finger introns located on the X and Y chromosomes using Polymerase Chain Reactions (PCR). Then I used gel electrophoresis to visualize PCR products and determine fragment size for sex assignment. I included both a negative and positive controls representing deer of known sex in each PCR and gel. The Y chromosome fragment was approximately 417 bp and the X chromosome fragment was approximately 236 bp in length. After I assigned sex to DNA samples, I calculated a sex ratio for the population. My results demonstrate that molecular sex assignment is possible using non-invasive samples (i.e., fecal pellets). Sex assignments will be used in future research to reconstruct family relationships.

POTENTIAL REGULATION OF FOS RELATED ANTIGEN IN MOUSE MAMMARY CARCINOMAS THROUGH PROTEIN KINASE C PATHWAY
Theresa Kaminski, Alex Peterson
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 80
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Michele Fluck (Microbiology and Molecular Genetics)

Fos related antigen 1 (Fra-1) is a member of Fos family of proteins, which facilitate cell cycle regulation and are linked to cancer initiation and progression. The Fra-1 protein is an oncogenic transcription factor that is perpetually expressed in both serum and starved conditions. Additionally, levels of this transcription factor are significantly more abundant in highly aggressive breast cancer, MDA-MB-231, as compared to the less invasive lines such as MCF-7. Previous research has indicated that the phospholipase C (PLC) gamma pathway is involved which is actually part of the Protein Kinase C (PKC). Although both stability and synthesis play a vital role in the relative abundance of Fra-1 during the cell cycle, our current work is focused on aiding in our understanding of which pathways are controlling the global expression of this influential metastatic-inducing protein. Inhibition of the activity of a potential relay system involving PKC and PLC-γ was done with subsequent measuring of the relative amounts of FRA 1 in mouse mammary carcinomas (e.g. Met-1). Partial reduction of Fra-1 levels was shown when inhibition of PKC pathway was inhibited.

IDENTIFYING THE ROLE OF MIXED LINEAGE KINASE SIGNALING IN GLIOBLASTOMA
Evita Moody
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 81
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Kathleen Gallo (Physiology), Sean Misek (Physiology)

Glioblastoma (GBM) is the most common and deadly form of brain tumor, with an average post-diagnosis survival time of 15

months. Because glioblastoma invades neighboring brain tissue complete removal of tumors is impossible, leading to recurrence. Therefore, there is a critical need to develop new GBM therapies. Past research has shown that kinase inhibitors have been successful at treating many forms of cancer, thus targeting protein kinases may be a viable strategy for treating GBM. Signaling through the epidermal growth factor receptor (EGFR), a receptor tyrosine kinase (RTK), is activated in at least 50% of GBM tumors and is associated with malignant phenotypes, including migration and invasion. Directly targeting EGFR has been largely unsuccessful due, in part, to up-regulation of other RTKs. Our study focuses on potential new therapeutic approaches to target intracellular kinases that signal downstream of multiple RTKs. Kinase inhibitors have been successful for treating many forms of cancer; identifying and targeting protein kinases may be a viable strategy for treating glioblastoma. The Mixed Lineage Kinases (MLKs) are MAP3Ks that activate multiple MAPK pathways, including the c-Jun N-terminal kinase (JNK), ERK, and p38 pathways. By targeting these pathways our goal is to find MLK inhibitors that will stop the downstream activation of MAP3Ks and other pathways.

PCR AND ELECTROPHORESIS TO REVEAL HOMOLOGY OF CFTR GENE BETWEEN HOMO SAPIEN, MUS MUSCULUS, AND CORVUS BRACHYRHYNCHOS
Marie-Louise Henry
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 82
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Douglas Luckie (Physiology)

The CFTR gene is an ATP-binding cassette transporter gene that codes for the cystic fibrosis transmembrane conductance regulator (CFTR) in vertebrates (El-Seedy et al, 2013). CFTR functions as a protein channel for chloride ions in epithelial cell membranes. Mutations of the CFTR gene may lead to improper regulation of epithelial fluid in the lungs, digestive and reproductive organs, resulting in cystic fibrosis. Study of genetically modified organisms with CFTR orthologous genes has revealed complexity of CF and spurred questions pertinent to genetic research (Wilke et al, 2011). My research focuses on studying homology of the CFTR gene in model organisms. PCR will be used to determine whether samples of Homo sapien, Corvus branchyrhynchose, and Mus musculus DNA contain the CFTR exon 20 gene sequence. Both published (Farra et al, 2008) and designed primers will be run. DNA will be extracted from epithelial bronchial cells of each organism (Qiagen Inc., 2007). I hypothesize that exon 20 of the CFTR gene will successfully be amplified, through PCR, in the DNA of an organism that encodes for CFTR because the first three nucleotides in the target region to which the 3' ends of the primers will bind are primer-complementary, which is all that is required for annealing with appropriate primers (Sommer and Tautz, 1989). The resulting amplified DNA will be analyzed using agarose gel electrophoresis to determine genotype.

GR-RNF43 REGULATION IN COLORECTAL CANCER
Irene Li
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 83
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Christina Chan (Chemical Engineering)

The advent of high-throughput technology has enabled global analysis of the transcriptome, driving the development and application of computational approaches to study transcriptional regulation and identify therapeutic molecular targets on the genome scale. Current identification methods require researchers to sort through myriad genes and potential pathways. In comparison to traditional methods focusing only on pairwise normal and cancer samples, we used a novel approach that capitalizes on a wide range of samples and conditions to collect differentially expressed genes with a high degree of specificity to colorectal cancer (CRC), the second leading cause of cancer-related death in the United States. Based on literature results and a comparison of the pairwise and multi-condition analyses, we identified two genes involved in regulating the CRC phenotype: glucocorticoid receptor 1 (GR) and ring finger protein 43 (RNF-43), which serve as a tumor suppressor and oncogene, respectively. We propose a regulatory mechanism between the GR and RNF43 genes, involving GR as a negative regulator of RNF-43. This was experimentally confirmed through selective knockdown of mRNA expression in HCT116 CRC cell line and further validation at the protein expression level is ongoing. Establishment of GR as a repressor of RNF-43 mediated oncogenic pathways could provide a novel target for CRC treatment in future studies.

THE TETRAPYRROLE SYNTHESIS PATHWAY AS A MODEL OF HORIZONTAL GENE TRANSFER IN EUGLENOIDS
Bryan Lakey
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 84
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Richard Triemer (Plant Biology)

The history of euglenoids began nearly two billion years ago. These early phagotrophs fed upon cyanobacteria, archaea, and

eubacteria. The appearance of red algae and chromalveolates (e.g. diatoms, cryptophyes and dinoflagellates) ~1.8-1.2 billion years ago, provided euglenoids with additional food sources. Following the appearance of green algae, about 1 billion years ago, euglenoids acquired a chloroplast via a secondary endosymbiotic event with a green algal ancestor. This event involved not only the acquisition of the chloroplast, but massive transfer of thousands of nuclear encoded genes from the symbiont nucleus to the host nucleus in order for the chloroplast to become incorporated as an organelle of the euglenoid. Expecting many of these genes to have a green algal origin, this research has shown, mainly through the use of DNA-sequences and the analysis of phylogenetic relationships, that many housekeeping genes have a red or orange algal ancestry. This suggests that other endosymbiotic events or horizontal gene transfers may have taken place before the acquisition of the chloroplast that transferred genes from chromalveolates to the euglenoid. After finding nearly 300 putative instances of this, the origin of the enzymes involved in the tetrapyrrole synthesis pathway have been the focus of this investigation providing insight into horizontal gene transfer in euglenoids. Thus demonstrating that the euglenoid nuclear genome is a mosaic comprised of genes from the ancestral lineage plus genes transferred endosymbiotically/horizontally from green, red, and chromalveolate lineages.

TYPE 1 DIABETES EFFECTS ON MARROW STEM CELL MATURATION
Sanna Fraleigh
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 85
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Laura McCabe (Physiology)

The JDRF estimates Type 1 Diabetes (T1D) affects 3 million Americans. T1D is an autoimmune disease when the body's immune cells attack and destroy insulin secreting pancreatic beta cells, resulting in little or no insulin production, and a plethora of complications including osteoporosis. T1D induced bone loss is caused by a decrease in osteoblast activity (bone formation). Data regarding T1D effects on osteoclast activity (bone resorption) varies, although the majority of studies report decreased activity. We hypothesize T1D reduces bone density by affecting marrow precursor cell differentiation from hematopoietic stem cells into osteoclasts, as well as from mesenchymal stem cells into adipocytes, rather than osteoblasts. To test this, we isolated and cultured femur marrow cells from T1D and healthy male and female mice, determining their ability to differentiate into the three cell lineages. My preliminary data indicates significantly lower in vitro osteoclast progression to early stage maturation (3-5 nuclei) than late stage maturation (6+ nuclei) in T1D compared to control mice regardless of sex. This observed osteoclastgenesis is consistent with the decrease in osteoclast activity observed in T1D subjects and mouse models. Adipocyte quantitation numbers (typically inversely proportional to osteoblast numbers) revealed T1D marrow from both sexes matured into a greater number of adipocytes compared to marrow from control mice. This is consistent with increased marrow adiposity in T1D mice, suggesting a reduction in osteoblastgenesis, as they share common precursor cells. Moreover, my data suggests T1D alters marrow stem cell maturation.

POSTER PRESENTATIONS, SECTION 2
MOSAIC MULTIPURPOSE ROOM, 9:00-11:00 AM

SUCCESSFUL PCR GENOTYPIC CLONING OF THE SOD1 GENE OF ALS PATIENTS USING HUMAN S9 CELLS
George Hyde
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 87
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Douglas Luckie (Biology)

Amyotrophic lateral sclerosis is a degenerative disease affecting neurons of the motor system. To understand ALS, the experimental purpose was to re-create successful amplification of SOD1 using published methods and primers, simulate living with ALS including associated pyshco-sociological aspects, and examine any similarities between ALS related genes in a homologous organism. We hypothesized that (1) through manipulation of temperatures and concentrations in PCR successful amplification of SOD1 would be seen at 1,200 bp; (2) social anxiety levels for persons with disabilities and bystanders would increase due to uncomfortable situations (wearing an oxygen mask); and (3) given similarities among genomes and primers of homologous organisms, successful amplification could be seen at 1,200 bp [Bos taurus] and 106 bp [Daphnia magna]. In order to test these hypotheses, three experimental methods were designed. First, PCR was utilized to amplify the SOD1 gene. Next, oxygen masks were worn for one month to class and around school, while measuring social anxiety levels of others and ourselves. Finally, PCR was utilized to amplify homologous genomes for comparison with human genome. We found that original amplification of Lambda gene was unsuccessful [Figure 3]. We predicted that (1) a bright band at 1,200 bp because of primer location (Prudencio et al., 2010), (2) social anxiety increases due to correlation with awkward environments (Cowden, 2014), and (3) gene specific primers would amplify homologous genes because similarity (Mossallam, 2011) (Lyu et al., 2013). Overall significance is to further research of ALS in order to understand the mechanism of disease.

IDENTIFICATION OF THE S2NCOA5 PROTEIN AND THE EFFECTS OF ITS OVEREXPRESSION ON LIVER CANCER CELL

GROWTH
Madeline Ross
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 88
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Hua Xiao (Physiology)

Hepatocellular carcinoma (HCC) is the fifth most common cancer in the world, with a two to four times higher incidence in men than women, and with an increasing incidence in the U.S. Following hepatitis virus infection and fatty liver disease, type 2 diabetes (T2D) is the next most common risk factor for the development of HCC. With the rise of diabetes in the U.S. and the prevalence of the hepatitis virus decreasing, diabetes may prove to be a more crucial risk factor in the future. In 2013, the nuclear receptor coactivator 5 (NCOA5) was presented as a suggestive genetic link between T2D and HCC, since NCOA5 heterozygous male mice with reduced NCOA5 expression were shown to develop glucose intolerance and subsequently HCC. Yet, the molecular mechanisms by which NCOA5 acts in the cell are still unknown and are currently being investigated. One area of interest is investigating splice variants of the NCOA5 protein. So far, only two variations of the protein have been observed, the full length NCOA5 and a shortened variant called SNCOA5. To aid in this endeavor, these results demonstrate the expression of another NCOA5 variant that is thought to be produced in the cell via an alternative start site of the SNCOA5 version, called S2NCOA5. Effects of overexpression of S2NCOA5 on cellular growth were also observed in vitro. These findings bring us closer to uncovering NCOA5's true mechanism, which can provide us with the opportunity to create treatment options to treat or prevent the development of HCC.

GASTRIC DILATATION VOLVULUS
Katharina Freiberger
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 89
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): John Fyfe (Microbiology and Molecular Genetics)

The purpose of this study was to determine if there was a genetic link for Gastric Dilation/Volvulus (GDV). This was explored through sequencing of the Motilin (MLN) and Ghrelin (GHRL) genes of affected and non-affected dogs. These two specific genes were focused on because a similar condition in cattle was recently linked to mutations in these genes. The sequencing of the DNA was one part of a larger study also looking into gastric motility and the levels of MLN and GHRL in the blood. Of the two genes GHRL contained six single nucleotide variants (SNPs) and MLN contained seven SNPs as well as a 25 base pair insertion sequence. From these mutations haplotypes were made and used to assess their correlation with affected, high- risk, and low-risk subjects. The dog's risk was determined if they had a familial member with GDV. Many of the dogs were related therefore it is difficult to determine if certain haplotypes have correlation to GDV or they are similar because of the familial relation. From the data no specific conclusions have been made because of the small sample size. For significant conclusions to be made a larger sample size would be needed as well as a variety of dogs from different bloodlines. Steps needed to be taken to get more conclusive evidence would be to get a sample size of upwards of 3,000 patients and more closely examine those trends.

DETERMINING THE CONGENIC INSERTS RESPONSIBLE FOR ASTHMA PHENOTYPE IN MICE
Leena Babiker
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 90
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Susan Ewart (Large Animal Clinical Sciences)

Background: Asthma is a common condition causing inflammation and constriction of the airways. While symptoms are triggered by environmental stimuli, susceptibility to asthma has a genetic basis. Mice are good models for studying asthma, because like humans, they develop eosinophilic airway inflammation and bronchial hyperresponsiveness. Previous research found that the A/J mouse strain exhibits these features of asthma, and the C3H/HeJ strain does not. This strain-specific susceptibility (A/J) and resistance (C3H/HeJ) to asthma has been associated with two quantitative trait loci (QTL) — Abhr1 and Abhr2 — on murine chromosome 2. Subsequently, two congenic strains of mice were developed, each with a different size insert containing the Abhr loci derived from A/J mice expressed on the C3H/HeJ genome. The goal of this project was to determine the size of the congenic inserts and whether the insert from the A/J strain is sufficient to induce bronchial hyperresponsiveness. Methods: Single nucleotide polymorphims (SNPS) and microsatellite markers that were variable between A/J and the C3H/HeJ mice were used to identify the breakpoints between DNA of A/J and C3H/HeJ origins on chromosome 2. Results: The A/J insert for strain A/J.C3H/HeJ-Abhr2 is 3.13 x 107 bp in size. The A/J insert for strain A/J.C3H/HeJ-Abhr1,2 is 5.17 x 107 bp in size. Studies are underway to assess the asthma phenotype of these congenic strains. Conclusion: Understanding the genetic basis of which genes are linked asthma, will allow a greater understanding for understanding asthma

mechanism of the disease, and will allow us develop therapeutic methods.

THE STORY OF GENOMIC ARCHITECTURE
Dustin Flynn
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 91
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Julius Jackson (Microbiology and Molecular Genetics)

The evolution of genomic architecture, in other words, how genes are organized on a chromosome and how it has evolved over time. Examining where exactly these genes are located on the genome today; whether they be in spatial patterns or clusters. Is there a significance to the order of the genes on the chromosome? We predict that metabolically related protein coding genes tend to cluster in bacterial chromosomes. Should we be able to support this, then the way we study bacterial evolution and the way we look into protein synthesis genes would drastically change. We would, in theory, be able to identify a gene, locate it on the bacterial chromosome and then be able to infer functions of surrounding genes. We could also look at which genes tend to cluster in which organisms and if that cluster is shared among closely related organisms. If it is, then how far down the lineage does this similarity go? This would give us a new understanding of the taxonomy of bacterial organisms. If our prediction holds true, then we need to explain how this happens and why. To test these hypotheses we are developing a computational program that will simulate large numbers of bacterial generations through time, from the early plasmid world billions of years ago to present day conditions. I am presenting a look at how the architecture of the genome is organized and discussing some of the theories we have regarding them.

DETECTING W1282X CYSTIC FIBROSIS MUTATION THROUGH ALLELE SPECIFIC PCR PRIMER DESIGN
Andrew Van Alst
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 92
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Douglas Luckie (Physiology)

A Yaku approach to primer design with the purpose of developing an allele-specific polymerase chain reaction (ASPCR) assay to detect the nonsense mutation W1282X causing Cystic Fibrosis was developed. This method aims to prevent primer binding to non-target nucleotide sequences (Yaku et al, 2008). Two allele specific Yaku designed primers, one specific for the W1282X mutation and one specific for wild type DNA, in conjunction with a reverse primer complimentary to both alleles were used in PCR with IB3 cell DNA heterozygous for W1282X in the CFTR gene. We hypothesized that false-positive results in the PCR diagnosis of the W1282X mutation causing CF would be reduced through the use of primer design with an intentional single base pair mismatch by successfully amplifying a sequence containing the mutation because it would increase PCR stringency and primer discrimination against non-complementary DNA. We found that each set of designed primers amplified a 560 base pair sequence from nucleotides 3953 to 4512 with the PCR protocol used in our controls and optimal annealing temperatures (Kerem et al, 1990). A band corresponding to 560 base pairs was visible in agarose gel electrophoresis when PCR was run with heterozygous template DNA and each set of wild type or mutant primers, supporting the Yaku focus in avoiding false-positive results using intentional mismatches (Yaku et al, 2008). Our assay is significant as it could be useful in expediting the treatment process of patients with W1282X, as it allows for quick diagnosis for specific mutations (Wu et al, 1989).

THE EFFECT OF DIET ON THE NORMAL BREAST
Lindsay Schichtel
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 93
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Mark Aupperlee (Physiology), Sandra Haslam (Physiology)

There is a growing body of research indicating that diet influences breast cancer risk. BALB/c mice fed a diet high in animal fat and treated with carcinogen had increased proliferation, blood vessel formation and inflammatory processes in the mammary gland that were associated with earlier forming breast tumors. These tumors also had increased proliferation, blood vessel formation and inflammatory processes evidenced by macrophage recruitment. We hypothesized that a high fat diet alone could influence these same parameters in the absence of carcinogen. In this study, mice were fed a particular diet starting at puberty: a continuous diet that was high in fat (HFD), a continuous low fat diet that served as the control diet (CD), started on a high fat diet and switched to the control diet in adulthood (HFD-CD), or started on the control diet and switched to the high fat diet (CD-HFD). Based on the previous diet plus carcinogen studies, we examined proliferation, blood vessel formation, and macrophage recruitment in diet only mammary glands from adult diet-fed mice. HFD and HFD-CD showed increased macrophage recruitment. There was no change in proliferation or blood vessel formation among the different diet groups. Thus, the primary impact of a HFD restricted to puberty or during the entire life of the mouse was on inflammatory cell recruitment in

the breast. Mice on the HFD did not become obese, suggesting that a HFD alone can increase inflammation in the breast which may lead to increased breast cancer risk.

POSTER PRESENTATIONS, SECTION 3
BALLROOM, 1:00-3:00 PM

UNDERSTANDING THE POTENTIAL CODING CAPACITY OF RNA EDITING IN TRYPANOSOMA BRUCEI
Alexis Weber
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 96
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Donna Koslowsky (Microbiology and Molecular Genetics)

Trypanosoma brucei is a parasitic protozoa that causes African Trypanosomiasis, more commonly referred to as African Sleeping Sickness in humans or Nagana in cattle. Trypanosomiasis is capable of decimating 50-100% of a livestock population costing Africa an estimated 1.2 billion dollars. Infection occurs when the parasite is transferred from their insect vector, the Tsetse fly, into a mammalian host. After relocating from one host to another, T.brucei must establish a different metabolic pathway using energy sources derived from their host. The shift in metabolism is accompanied by RNA editing, the process by which guide RNAs (gRNAs) insert and delete uridines in the mitochondrial mRNA transcript. Recent investigations have revealed that different sets of gRNAs may alternatively edit the mRNAs, generating new mitochondrial proteins. Non-canonical editing is predicted to occur at the 3′ end of the NADH Dehydrogenase subunit 9 (ND9) mRNA transcript based on mismatches discovered in abundant gRNA populations. If the resulting proteins change in structure, function, or quantity, this may provide more insight into the process by which RNA editing regulates the trypanosome life cycle.

THE REGULATORY EFFECT OF ARC6 ON FTSZ2 POLYMER FORMATION
Christopher Porzondek
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 97
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Katherine Osteryoung (Plant Biology)

FtsZ1 and FtsZ2 are cytoskeletal GTPases that assemble into an FtsZ ring, which drives chloroplast division. ARC6, an inner-envelope spanning membrane protein, is critical for Z-ring formation and is thought to be a positive regulator of FtsZ assembly, specifically through its interaction with FtsZ2. However, the nature of this regulatory effect is not well understood. To address this we are utilizing S. pombe (which does not contain endogenous FtsZ) as a heterologous expression system to analyze the effect that ARC6 has on FtsZ2 filament morphology and steady-state turnover. FtsZ2 and ARC6 fluorescent fusions were generated and coexpressed in S. pombe, where we performed colocalization analysis and will subsequently perform FRAP analysis. Further analysis of ARC6/FtsZ2 interaction involves the creation of ARC6 truncations (FtsZ binding domain only (located within the stromal region) and full length stromal). We found that ARC6 constructs composed of either the full stromal (ARC6stromal) or FtsZ binding domain (ARC6ZBD), both specifically interact with FtsZ2 in fission yeast. This work is consistent with the current view that ARC6 interacts with FtsZ2 through the ARC6ZBD. Based on in vivo genetic data, we hypothesize that ARC6 directly stabilizes FtsZ2 filaments. Utilizing FRAP analysis, we expect that FtsZ2 polymer turn-over will be decreased in the presence of ARC6.

PROGESTERONE, PROLIFERATION, AND BREAST CANCER RISK IN THE POSTMENOPAUSAL HUMAN BREAST
Frances Greathouse
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 98
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Mark Aupperlee (Physiology)

Postmenopausal women on estrogen + progestin (E+P) hormone replacement therapy (HRT) have an increase in breast density, breast epithelial cell proliferation and breast cancer risk. E alone increased proliferation in the breast and E+P further increased proliferation, so the increase in breast cancer risk on E+P may be due to increased proliferation. E+P HRT decreased p27, a cell cycle inhibitor, and increased cyclin E, which is involved in cell cycle progression. The purpose of my study is to further elucidate how progestins increase proliferation in the breast by examining expression of amphiregulin (Areg) in postmenopausal and premenopausal women. Areg is known to increase proliferation by binding to the epidermal growth factor receptor (EGFR), and Areg may act to mediate the E+P-induced decrease in p27 and increase in cyclin E in E+P HRT samples. Our hypothesis is that E + P HRT postmenopausal samples and premenopausal samples from the luteal phase when progesterone is highest will have the greatest expression of Areg. I will examine Areg expression by immunofluorescence in postmenopausal human breast tissues from women receiving no HRT, E HRT and E+P HRT and in premenopausal human breast

tissues from women during the luteal vs. follicular phase of the menstrual cycle. Presented here are preliminary data that suggests both E and E+P HRT increase Areg expression in the postmenopausal breast. Further analysis is required to detect any potential difference in Areg between E and E+P HRT.

FOXO EXPRESSION CANALIZES ORGAN DEVELOPMENT IN DROSOPHILA THROUGH INTRINSIC MECHANISMS
Adam Matynowski
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 99
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Austin Dreyer (Zoology)

FOXO is a negative growth transcription factor that is located at the end of the insulin-signaling pathway. Canalization is the process through which a particular tissue produces the same size product regardless of changes in its environment during development. Canalization through intrinsic mechanisms has never been discovered only extrinsic mechanisms are known. We propose that FOXO in Drosophila is an intrinsic mechanism to canalize organ development due to its importance in the insulin-signaling pathway. We collected wings from flies that had been reared at 23°C and 25°C with FOXO modification and measured wing size. We compared those wings sizes to the control lines that were reared at the same temperature without FOXO modification. The flies with increased FOXO expression (25°C) should have an increased level of canalization, or more consistent wing size, than the control lines reared at the same temperature. The flies with decreased FOXO expression (23°C) should have a decreased level of canalization than their respective control lines. There is little research on canalization and it is a very important concept for evolutionary biologist. The detection of canalization through FOXO would be the only intrinsic mechanism found. It would also start to show how organisms have adapted to produce consistent products during development even through changes in environment.

INVESTIGATION OF VARIABLE CANINE SINES' INDICATION OF BREED LINKAGE
Chandler Stimach
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 100
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Patrick Venta (Microbiology and Molecular Genetics)

Linkage analysis of SINEs in various canine breeds is useful in determining relatedness. SINEs active in canine genomes slowly increase in frequency across breeds overtime. Unlike genes or alleles, SINEs resist phasing out due to selection due to minute or insignificant expression. We hypothesize that SINEs of 50% allelic frequency across breeds may be a good tool to indicate genetic statistical analysis. This preliminary study strives to identify ideal contender insertions for further research and weed out SINEs or primer sets unfit. Additionally, we hypothesize that SINEs with similar sequences will have similar allelic frequencies. Primer sets designed to select specific, known canine SINEs were used in PCR of 10 different breed samples. Amplified samples were analyzed for the presence and frequency of the insertion across breeds. SINEs sequences were compared and a phylogenetic tree was built to observe trends between relatedness and allelic frequency. Seven SINES of 32 were close to 50% allelic frequency, and only one was 50%. When observing the phylogenetic tree, it seemed some SINEs were compliant with the hypothesis, but overall similar sequences did not trend towards similar frequencies. Further investigation of SINEs with close to 50% frequency using more breeds and samples will be necessary to find an ideal genetic marker. It appears similar SINE sequences does not give indication for similar frequencies, however, an alternative hypothesis could explain that closely related SINEs have different frequencies because one of less frequency stems from a mutation, thus is a younger SINE with lower frequency.

A SUBSURFACE INVESTIGATION OF MICROBIAL DENSITY AND DIVERSITY IN PROXIMITY TO THE RED CEDAR RIVER AT MICHGAN STATE UNIVERSITY
Megan Hudak, Mary Sabuda, Jordan Salley
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 101
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Matt Schrenk (Geological Sciences)

In December 2014, soil samples were collected from the 30-foot cores of 17 monitoring wells installed next to the Red Cedar River on Michigan State University's (MSU) campus. The soil samples were homogenized, and DNA was extracted and isolated in February 2015. In order to determine the density of microbes in each sample, Qubit and NanoDrop techniques were applied. MSU's DNA sequencing lab will provide the microbial species diversity based upon the DNA extracted from each sample. It is hypothesized that species diversity will be higher in proximity to the Red Cedar River, and species will change with respect to the phreatic, vadose, and flux zones. While the extraction and quantification process is ongoing, it is noteworthy to add that species density for well PC01 decreased an average magnitude of ten with each consecutive five feet of depth, which reinforces

this hypothesis. This research is important because it is a unique study in microbial science due to the abundance of wells and their proximity to each other and the river. Furthermore, it is unknown the species diversity and density of the subsurface on Michigan State's campus. This work was conducted through the Geomicrobiology Lab at MSU in collaboration with the Hydrogeology Lab. Further studies could be conducted to assess the correlation between Hydrogeology water monitoring studies and the microbial results presented.

POSTER PRESENTATIONS, SECTION 4
BALLROOM, 1:00-3:00 PM

EXPRESSION OF DIOXIN METABOLIC GENES IN DIBENZOFURAN DEGRADING ORGANISMS
Anjesh Ghimire
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 106
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Lisa Boughner (Center for Microbial Ecology)

Dioxins are highly toxic compounds produced from natural and industrial processes. Areas contaminated with dioxin take years of labor and millions of dollars to treat. Sphingomonas wittichii RW1 can metabolize two types of dioxin; dibenzo-p-dioxin (DD) and dibenzofuran (DBF) via an angular dioxygenase, dxnA1A2. Rhodococcus sp. strain YK2 and Paenibacillus sp. strain YK5 are both DBF degrading organisms. RW1 encodes the angular dioxygenase in two genes; dxnA1 and dxnA2. Our goal is to determine if addition of the angular dioxygenase from RW1 will enable YK2 and YK5 to metabolize DD. We believe that addition of dxnA1A2 to YK2 and YK5 will enable them to metabolize DD. We constructed a plasmid containing the dxnA1A2 genes, and grew YK2 and YK5 in minimal media. The plasmid with dxnA1A2 will be transformed into YK2 and YK5, and the cells will be grown with DBF in minimal media as a selective agent and sole carbon source. Kanamycin will be added to prevent plasmid curing. DD will be added to determine if acquisition of the plasmid resulted in DD metabolism. There are two possible outcomes: YK2 and/ or YK5 will metabolize DD after transformation, or YK2 and/ or YK5 will remain unable to metabolize DD after transformation. If one or both organisms metabolize DD, we can attempt small-scale remediation of systems affected by DD pollution. If both organisms are unable to metabolize DD, further research will be performed to determine which other parts of RW1's genome, in addition to dxnA1A2, are needed for DD metabolism.

HUNTINGTON'S DISEASE: A COMPREHENSIVE BIOMOLECULAR AND PSYCHOSOCIAL STUDY
Hayden Stoub, Linda Chen, Kealan Millies-Lucke, Mellissa Ungkuldee
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 107
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Douglas Luckie (Physiology)

Huntington's Disease (HD) is a neurodegenerative disease caused by a mutation in the 5-HTT gene. This mutation affects the production of the protein huntingtin (HT), the malformation of which results in psychological, behavioral, and psychomotor symptoms. This study sought to design a polymerase chain reaction (PCR) assay to isolate and clone the 5-HTT gene in human bronchial epithelial cell specimens and a homologous gene within Picoides pubescens DNA by PCR methods adapted from prior studies. The homologous gene in question, SLC6A4, is a highly conserved gene also related to serotonin transport in the same fashion as the 5-HTT gene. The amplified genes were analyzed via gel electrophoresis. Diagnostic PCR assays are commonly used to confirm HD diagnosis in patients in the pre-diagnostic stages of the disease or in patients with significant familial history. This study seeks to create a more comprehensive understanding about HD, its causes, and the genetics involved in this debilitating disease.

FOR IMMUNE EVASION IN GROUP B STREPTOCOCCUS
David Knupp
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 108
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

Group B Streptococcus (GBS) is the leading cause of sepsis, meningitis, and pneumonia during the neonatal period. Commonly found among women, GBS colonization of the vaginal tract has been reported to be up to 30%. The severity of GBS is attributable to its ability to control virulence and immune evasion using a two-component regulatory system that responds to external stimuli. Within GBS, the primary two-component regulatory system driving virulence is CovR/S. An invasive clinical isolate displaying increased biofilm production, macrophage evasion, and higher lethality in mouse models, while lacking in vitro production of known virulence determinants, β-hemolysin and pigment, was found to contain a non-synonymous, single nucleotide polymorphism (SNP) in covS, unique to this invasive strain. To address the relation between sequence variation in

covS, the SNP was mutated to resemble the genotype of strains without SNP presence in covS via site directed mutagenesis. Mutant was shown to express β-hemolysin and pigment production, which may be important for virulence and immune evasion. The presence of this SNP therefore, may be evolutionarily favorable as it may allow for enhanced immune evasion, allowing GBS to persist in harsh, unfavorable environments within the body. Further work will address biofilm production, macrophage evasion, and pathogenesis in a mouse model, and differential expression of gene candidates regulated by CovR/S between mutant and WT in association with virulence, under various physiological conditions.

REGULATION OF TFAP2A GENE EXPRESSION BY IRF6 IN PALATAL PERIDERM
Keith McAuley
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 109
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Brian Schutte (Microbiology and Molecular Genetics)

Cleft lip and palate is a common birth defect, affecting 1 in 1000 children. Mutations in TFAP2A and IRF6, two genes that encode for transcription factors, cause cleft lip and palate. Both of these genes are expressed in the periderm, a single layer of cells that cover the palatal shelves. Previous studies showed that Tfap2a regulates the expression of Irf6. In this study, we asked the opposite question, does Irf6 regulate the expression of Tfap2a, thereby creating a feedback loop. Feedback loops are mechanisms found in development to assure proper expression of key genes. To address this question, we examined Tfap2a protein levels in Irf6 knockout mice by immuno-staining. We found that Tfap2a is present in the palatal periderm at time point E13.5, but its levels were reduced at E17.5. These preliminary data suggest that Irf6 is in a positive feedback loop with Tfap2a. Future studies will also measure Tfap2a mRNA levels to better understand the mechanism of this regulation. This study is a first step towards a full gene regulatory network for the periderm. Since periderm function is critical for palatogenesis, these data will help delineate pathophysiological mechanisms for cleft lip and palate that can be used for improved diagnosis, risk assessment and rationale interventions to prevent this common birth defect.

IS NTN1 REQUIRED FOR PALATOGENESIS IN MOUSE?
Bryana Bryan, Eric Fuller
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 110
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Brian Schutte (Microbiology and Molecular Genetics)

Cleft lip and palate (CLP) is a common birth defect affecting about 1 in 700 live births worldwide. Previous Genome Wide Association Studies (GWAS) showed that DNA variants at chromosomal region 17p13 were associated with (CLP). The nearest gene is Netrin-1 (NTN1), which encodes a protein that is involved in axon guidance and cell migration. Ntn1 knockout -/- mice die shortly after birth. When examined grossly, they lack the white milk spot in their stomach, suggesting that they are unable to suckle. This is a common phenotype in mice that have a cleft palate. Based on the genetic studies in humans and mice, we hypothesize that Ntn1 -/- knockout mice have a cleft palate. To test this hypothesis, we will perform standard histological staining on frontal sections from wildtype and knockout embryos at E14.5 to search for palatal abnormalities. To date, we collected the tissues and sectioned one wildtype embryo. We will continue to section and stain 5 embryos of each genotype. The results of this animal study will provide strong evidence for or against Ntn1 as a gene involved in cleft lip and palate, and will help delineate the cause of neonatal lethality in these mutant mice.

COMMUNICATION ARTS & SCIENCES

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

THE EFFECT OF SOCIAL STRESS ON DISFLUENCY AND FUNDAMENTAL FREQUENCY IN SPEECH
Allison Woodberg
Category: Communication Arts and Sciences, Section 1
Poster: 113
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Pasquale Bottalico (Communication Sciences and Disorders), Simone Graetzer (Communication Sciences and Disorders), Eric Hunter (Communication Sciences and Disorders)

Stress is known to cause significant physiological changes in heart rate, blood pressure and galvanic skin response, but effects on the voice, specifically fluency of speech, are not as well studied. In this experiment, students were recruited to complete

speaking tasks in an unstressed condition, and a stressed condition. Stress was implemented through a modified Trier Social Stress Test. To be sure stress was induced, physiological parameters were measured. Fundamental frequency and fluency information were analyzed from recordings. Implications of this study include how the environment, in which a person is speaking, can alter their fluency. This can be applied to group speech therapy sessions, as well as forensic acoustics, and professionals, such as teachers, who use their voice in the presence of others frequently.

AVATARS IN THE CLASSROOM: A STUDY OF IDEAL OR ACTUAL SELVES AND WELLNESS EXERCISES
Liam Martin, Evan Lipsitz, Dylan Vanbocxlaer
Category: Communication Arts and Sciences, Section 1
Poster: 114
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Shaheen Kanthawala (Media and Information Studies), Rabindra Ratan (Media and Information Studies), Janine Slaker (Media and Information Studies)

This research will provide insights into how to improve academic self-efficacy and academic motivation for college students. Although social media use often contributes to distraction from classwork, we argue that such media can also be used to enhance students' educational outcomes. Students in the proposed study will use a social media tool either individually or in small groups from within their classes. The media-based tasks – which involve engaging in socially supportive communication with their classmates, self-reflection, and using avatars that represent ideal or actual selves – are expected to enhance social connectedness with other students in the class, which we expect to lead to increases in their academic self-efficacy and academic motivation as well as reductions in student stress.

EXAMINING HOW DIGITAL LEARNING TECHNOLOGIES CAN ADAPT TO USER CHARACTERISTICS TO MAXIMIZE POSITIVE OUTCOMES
Zachary Terry, Paul Powell, Tommy Schutter
Category: Communication Arts and Sciences, Section 1
Poster: 115
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Denice Blair (Teacher Education), Joseph Fordham (Media and Information), Rabindra Ratan (Media and Information)

As digital learning platforms become increasingly diverse, there is the need for technologies that appropriately match diverse user bases in ways that maximize learning potential for all users. The present research addresses this issue by examining how the relationship between an element of a digital learning technologies (i.e., artificial agent gender) and specific user characteristics (i.e., gender and age) influence user motivation within the context of a digital science-learning game, Hungry Birds, which is designed to illustrate the concepts of natural selection to museum visitors. Through a partnership with the game's producer, we helped design the scientist characters in the game – who serve as guides to the game and learning content – to reflect four gender categories: high/low masculine male and high/low feminine female. In an IRB-approved field experiment using this game, we found scientist gender influenced motivation to perform in the game. For 17-18 year-olds, across high- and low-gendered scientists, there was a significant interaction effect between player gender (male/female) and scientist gender (male/female), with male players scoring higher with a male than a female scientist, but female players scoring higher with a female than a male scientist. Lastly, but perhaps most interestingly, for 13-14 year-olds, across male and female scientists, there was a significant interaction effect between player gender (male/female) and scientist gender (high/low), with male players scoring higher with a high-gender than a low-gender scientist, but female players scoring higher with a low-gender than high-gender scientist.

MODELING THE DIFFUSION OF SHARED VOTES ON FACEBOOK
Paul Rosemurgy
Category: Communication Arts and Sciences, Section 1
Poster: 116
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Emilee Rader (Media and Information)

There has been much discussion concerning the potential for Facebook to influence the outcome of an election through social signals about voting behaviors, made possible by an "I Voted" button that users can click to let their friends know that they voted. Bond et al. (2012) found that receiving a social message about others' voting behavior resulted in greater voter turnout. This has raised a question about whether Facebook has the power to differentially mobilize voters and influence which political party receives more votes. We created an agent-based model to simulate how the diffusion of social signals of voting behavior results in network-level voting patterns. We simulated many different scenarios by varying initial conditions such as the size of the network, average number of friends, and percent of participants who will initially share their vote. Our simulation measures network level outcomes such as the total number of votes induced by the interaction of individual agents within the network.

When individuals in a social network recursively influence their neighbors by announcing that they voted, network-level voting patterns appear. An increase in the sharing of voting behavior is directly related to an increase in the number of votes. The model can also be utilized to suggest that Facebook not only has the power to influence the number of votes, but also which political party will vote more when the option to share votes is given to exclusively one political party.

EVALUATING FACEBOOK MARKETING STRATEGIES BASED ON CULTURE AND PURCHASE INVOLVEMENT
Nina Gennusa, Paige Bruno, Clint Dobrinski, Evan Dunbar, Kiley Novak
Category: Communication Arts and Sciences, Section 1
Poster: 117
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Constantinos Coursari (Media and Information), Wietske Van Osch (Media and Information)

In this study, we report the results of a multiple-case content analysis of Facebook posts by 15 brands over a one-month period. We conduct a cross-cultural comparison of U.S., Korean, and Japanese brands across five product categories, namely: Airlines, Beer, Burgers, Coffee, and Superstore Chains to reveal cultural differences with respect to messaging strategy, content, and richness. Results show that the level of involvement in purchase dictated the messaging strategy used by these brands. Airline companies have a high involvement product and in theory should have more informational content. This was true for the American brand, but not for the Korean and Japanese brands. For medium involvement purchases, such as the case of Superstore Chains, the American and Korean brands used transformational messages most prevalently, while the Japanese company used an informational strategy. For medium involvement purchases purposes we expect a mix of informational and transformational posts. Coffee, Beer, and Burger brands account for fast moving consumer goods, which are low involvement purchases. In theory we expect to see transformational posts as the most prevalent strategy. The Coffee and Beer brands from the American, Korean and Japanese brand adhered and were predominately transformational posts. In the case of burgers, the American and Korean brand stayed true to form, while the Japanese brand used more informational posts. Along with the type of messages, we studied the content type, media richness, and weighted average engagement of the marketing strategies of the five brands: Airlines, Beer, Burgers, Coffee, and Superstore Chains.

DETERMINING AFFECT THROUGH THE PRESENTATION OF COMIC IMAGERY: INSTILLING EMOTIONS THROUGH EDUCATING ABOUT DISEASE
Alyssa Zokoe
Category: Communication Arts and Sciences, Section 1
Poster: 118
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Ryan Claytor (Art, Art History, and Design), Julie Libarkin (Geological Sciences), Stephen Thomas (Natural Science)

Social media covers every event that occurs worldwide—it gives a glimpse of what is happening; however, it fails to illustrate all the facts. The little information that is given is misconstrued in the minds of everyday people. Serious topics are given little attention, and some may turn into the "joke of the day" on many social media websites simply because some are not aware of the severity of the issue. In the experiment that was conducted, information about the Ebola virus was illustrated through a narrative comic. Subjects were questioned before and after reading the comic to test their cognitive level of thinking about Ebola as well as their emotional stance about the issue. Also, while subjects were reading the comic, their eye movements and fixations were recorded using eye tracking software to observe which elements of the comic were paid attention to by each individual and overall. In this presentation, the process of observing affect through visual forms of communication such as a comic is studied to see whether subjects develop a sense of perspective, awareness, and emotion, while still learning a sufficient amount of information about a topic.

CROSS-CULTURAL COMPARISON OF TWITTER BRAND STRATEGIES: KOREA AND THE UNITED STATES
Kara Weingartz, Michael Booth, Kristin Brandt, Matthew Richter, Kaitlyn Setter
Category: Communication Arts and Sciences, Section 1
Poster: 119
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Constantinos Coursaris (Media and Information), Wietske Van Osch (Media and Information)

In this study, we report the results of a multiple-case content analysis and cross-cultural comparison of Tweets by 3 brands advertising in both Korea and U.S. The selected brands (Hite Jinro, Burger King, and Korean Air) represent (beer, burgers, and airlines). Findings of our study show the appropriation of content to the respective cultural context—Korean and U.S.—across three dimensions, namely messaging strategy, content, and richness.

POSTER PRESENTATIONS, SECTION 2
BALLROOM, 9:00-11:00 AM

MENTAL MODELS AND ONLINE COMMUNITIES
Paul Rose
Category: Communication Arts and Sciences, Section 2
Poster: 122
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Rick Wash (Journalism)

Many problems of today's interconnected world necessitate collaborative efforts that can produce knowledge and coordination unfound in just one individual. Online communities, or communities of people working toward some goal who are mediated by the Internet, are a promising path to tackle these problems. These range from general goals, like collaborating on Wikipedia to create an online encyclopedia of information, to specific goals, like Climate CoLab where people collaborate on ideas to solve climate change. In order for these communities to be effective, however, a 'critical mass,' or threshold level of participants, is needed to participate and contribute to produce results. This portion of the broader research project seeks to understand people's underlying cognitive processes, or mental models, in understanding the purpose, desires, and future of an online community. We analyzed interviews in which people were asked to explore the online communities Reddit or Quora with either no or very little prior knowledge about the sites. They were asked questions about their own online community usage, prior expectations of the site, hypotheticals about the site, and a think aloud where they explored the site itself. Several rounds of coding the interviews led us to patterns across people in how they thought about the site and arrived at their understandings. Identifying these mental models that people use in learning about an online community and its purpose will help us better design online communities in the future to sustain a critical mass of participants.

EFFECTS OF VOICE PITCH ON JUDGMENTS OF SPEECH OF CHILDREN WHO STUTTER
Kayla Tillman, Amanda Depelsmaeker
Category: Communication Arts and Sciences, Section 2
Poster: 124
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders), Danielle Gage (Communicative Sciences and Disorders)

Stuttering is a speech and language disorder characterized by disruptions in the production of speech sounds. Stuttered speech often includes repetitions of words or parts of words, prolongations of speech sounds, blocks or pauses, interjections such as "um" or "like", or delays of initiating sounds. A critical question from a theoretical standpoint is whether the perception of prosody within a speech signal is independent of the perception of other components of the speech signal or interdependent with other components. Prior findings have indicated that the speech of typically developing child talkers, when modified to a lower pitch contour, was judged to be slower, less fluent, and less intelligible than speech with a higher pitch. The present study tested the generalizability of these findings to speech of children who stutter. Fundamental frequency of speech of children who stutter was raised, lowered, or kept at its original level. Listeners assessed speech rate, fluency, and talker likeability on a scale of 1-6; in addition, listeners estimated the percentage of words understood and the likelihood of cognitive impairment. Results will be discussed in terms of theories of speech perception and the practical implications for stuttering theory.

CROWDFUNDING CLASSROOMS: HOW TEACHERS AND THE INTERNET FUND OUR SCHOOLS
Meghan Huynh
Category: Communication Arts and Sciences, Section 2
Poster: 125
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Rick Wash (Journalism)

DonorsChoose.org is an online charity that allows anyone to fund projects for schools across the United States. Currently, only 70% of the total projects on the site are fully funded. We want to know what determines a successful, fully funded project and how teachers can continue to have successful projects over time. Teachers have been able to advertise their projects through free form essays and experiment with different methods for attracting donors. To improve the impact of their essays and to decrease the amount of guesswork, DonorsChoose has changed the format for these essays by providing 4-paragraph essay fields and questions for teachers to answer within their essays. The revised format has allowed teachers to focus on sharing specific information about their project in order to connect with their donors and achieve fully funded projects. By continuing to observe what teachers and DonorsChoose learn from each other, we hope to discover ways for DonorsChoose to increase the percentage of successful projects for the teachers and students that need them.

USING DIGITAL SPACES TO SUPPORT WOMEN FILMMAKERS
LeeAnn Connelly, Kathrine Grimes
Category: Communication Arts and Sciences, Section 2
Poster: 126

Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Alexandra Hidalgo (Writing, Rhetoric, and American Cultures)

Marketing's shift from physical to digital spaces over the past decade has opened up amazing opportunities for small-budget film projects and independent filmmakers. Easy-to-navigate content management systems such as Wordpress and social media sites such as Twitter and Facebook allow indie films to create communities of viewers and activists around their unique projects. These online spaces also allow independent filmmakers from around the world to connect, collaborate, and mentor one another in ways that were once impossible. In this poster, we will present findings gathered from promotional work for Vanishing Borders, a feature documentary about four immigrant women living in New York City, and editorial/marketing work for agnès films, an online community and venue for publishing work about women filmmakers and their films. In this work--completed primarily on WordPress, Facebook and Twitter--we have integrated our previous experience with digital spaces, models of sites with similar objectives, and on-going experimental work to produce a successful social media strategy and a series of promotional documents. We have used digital spaces to reach out to and connect with various communities of women interested in immigration and filmmaking and, in essence, create communities grounded in film and filmmaking. Our findings and evolving strategies will be beneficial to up-and-coming filmmakers and their collaborators as they too seek to promote their films and create their own communities. They will also be of interest to anyone seeking to create social media campaigns and online presence for art projects and non-profit organizations working to forward social causes.

THE COLOR THEORY: INVESTIGATING EFFECTS OF COLOR ON ADVERTISEMENTS' EVALUATIONS AND BEHAVIORAL INTENTIONS
Kirstyn Shiner
Category: Communication Arts and Sciences, Section 2
Poster: 127
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Saleem Alhabash (Advertising and Public Relations)

Advertisers are continuing to look for ways to attract consumers through new advertising techniques. This research looks to expand on our knowledge about advertising and colors. The goal of our research is to see how people are affected by the color of advertisements and how it influences their evaluations of ad and the brand, as well as their online and offline behavioral intentions. Using Kobayashi's color theory, we created 13 color combinations of ads for a furniture brand relevant and popular among college student (i.e., Ikea). Participants were recruited from Michigan State University's College of Communication Arts and Sciences' SONA pool. Each participant looked at a combination of colors (13 different colors) and furniture advertisements (3 unique furniture advertisements). Following the manipulation, participants reported their attitudes toward the ad and the brand, as well as their viral behavioral intentions (intentions to like, share, and comment) and their purchase intent. This research provides a clearer understanding of how people are influenced by colors in advertisements and see how these advertisements influence consumers' behaviors online and offline. At the University Undergraduate Research and Arts Forum, I will be presenting findings of how the color choices affects the consumers overall opinion of the ad itself as well as the overall brand. The research will be supplemented with a poster board to show the cumulative findings.

ANALYZING THE PSYCHOPHYSIOLOGICAL EFFECTS OF FACEBOOK USAGE
Elishia Johnson, Morgan Eisele
Category: Communication Arts and Sciences, Section 2
Poster: 128
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Saleem Alhabash (Advertising and Public Relations)

Social media has increasingly become an integral part of our lives. These websites and applications have become so integrated into our everyday activity that its use tends to affect us psychologically. Our research uses psychophysiological measures to analyze the cognitive and affective responses to using one of the most popular social networking sites (SNSs), Facebook. In this particular study, participants were asked to browse their personal Facebook pages while their eye movement (e.g. gaze and fixation) was tracked using the Tobiii TX300 Eye Tracker and their psychophysiological responses using the BIOPAC MP150 systems. With regard to psychophysiological measures, electrodes were placed strategically on participants' arms and faces, to monitor the following: heart rate (cognitive resource allocations), skin conductance (arousal), corrugator supercilii (unpleasant emotion), orbicularis oculi and zygomaticus major (pleasure emotion), and levator labi (disgust emotion), among other signals. During the experiment, participants were asked to organically browse their Facebook for a total of five minutes, then they were given three minutes to complete each of the following tasks: like, comment and share a piece of content as well as posts a status update. This method helps us understand how affective and cognitive responses to content on Facebook can predict online behavior. We expect to give a meaningful implication to social media practitioners as well as its audience by revealing people's reactions to each component of social media. In this presentation, we will provide a methodological overview of the results as well as preliminary results of the study.

POSTER PRESENTATIONS, SECTION 3
MOSAIC MULTIPURPOSE ROOM, 1:00-3:00 PM

EFFECTS OF CONTEXT SPEECH RATE ON PERCEPTION OF SPOKEN WORDS IN CONNECTED SPEECH
Zachary Ireland, Stephanie Schmidt
Category: Communication Arts and Sciences, Section 3
Poster: 131
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders)

Recent research has shown that speech rhythm and timing information, such as speech rate, can affect which words listeners hear. What are the principles by which context temporal information affects spoken word recognition? We tested the hypothesis that both proximal and distal speech rate play a critical role in function word perception. Short phrases were constructed that contained a function word, but were grammatical with or without one. Resynthesized versions of these phrases were created, varying the rate of surrounding speech material. Results showed that function word perception was strongly affected by proximal and distal speech rate, demonstrating the important role of timing in perceiving highly reduced speech. The results shed light on basic mechanisms of speech timing perception and have potential to increase understanding of certain speech-language-related disorders.

INTEGRATING INFOGRAPHICS INTO CULTURAL COMPETENCY GUIDES
Cody Harrell, Jenna Chapman
Category: Communication Arts and Sciences, Section 3
Poster: 132
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Joe Grimm (Journalism)

Ever since his days with the Detroit Free Press, editor extraordinaire Joseph Grimm has been working to integrate the idea of "cultural competency" into the future newsroom. This passion for the integration of diversity evolved into the first cultural competency guide, "100 Questions & Answers about Arab Americans." Now a professor in the School of Journalism, Joe has evolved this idea into a class subject for many future journalists. Joe recruited me to join his project in the beginning of the 2013-2014 school year. I am the graphics editor and XML tagger for the now seventh and eighth installments of these guides, and have been a part of the project for my past two years in the School of Journalism. My presentation will present my methodology for creating infographics, maps, layouts and digital editions for these guides. The guides I will be presenting show demographics and visual explorations of questions and answers about Muslims, Veterans and Jewish Americans. Once the guides are written and revised, Joe asks me to read over the guide and brainstorm ways to visually represent topics in the book that words can't always explain. My role as a visual communicator is to take numbers, maps and ideas and reconstruct them for all types of visual learners. Through these guides, I hope to expand the readership of these guides and create graphic representations that are easily read and understood by all.

ANALYSIS OF HUMAN BEHAVIOR CHANGE REGARDING ENVIRONMENTAL IMPACTS THROUGH OBSERVATION OF A VISUAL PIECE AND ONLINE SURVEYS
McKayley Gourley
Category: Communication Arts and Sciences, Section 3
Poster: 133
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ryan Claytor (Art, Art History, and Design), Julie Libarkin (Geological Sciences), Stephen Thomas (Natural Science Dean)

For my study, I conducted a survey regarding an environmental visual informational piece in order to test participants' prior knowledge regarding the subject and, later, any behavioral change that the visual informational piece induced. The surveys were conducted using Amazon's Mechanical Turk, an online database for crowdsourcing. 100 surveys were used to gather sufficient and varied results. This type of crowdsourcing tool compensates participants for their time and energy put into the survey. I will be presenting on the effect a visual piece has on participants' willingness to alter their daily habits regarding the environment. The main goal is to determine whether the positive effects for the environment and possibly for themselves can induce a behavioral change. This research is important because it has the potential to alter the way people view themselves in relation to how they affect the environment. If visual pieces like this have the ability to induce a behavioral change, then they could be employed in marketing and advertising endeavors to create a healthier planet and population.

THE USE OF SALIENT ELEMENTS IN COMICS TO ELICIT A CHANGE IN EMOTION ABOUT A SCIENTIFIC TOPIC
Sydney Rivard
Category: Communication Arts and Sciences, Section 3

Poster: 134
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ryan Claytor (Art, Art History and Design), Julie Libarkin (Geological Sciences), Stephen Thomas (Geological Sciences)

Scientific topics like water pollution are most often presented to the public in the form of infographics or text-based articles. The goals of this communication often focus on informing the audience about the topic, as well as eliciting an emotional change that will ultimately induce a change in behavior. This research focuses on the efficacy of artistic components present in comics in producing a change in emotion regarding a topic. The focus of this project is to assess the specific effects of the addition of color to a comic in eliciting an affective change. Eye-tracking data and interview questions are used to determine if subjects experience a shift in emotion after viewing a comic. Two treatments, a comic in black-and-white and the same comic in color, were used. Interviews expose evidence of preconceived notions and feelings about the topic, while eye tracking data provides evidence of attention to salient elements in the comic. Results divulge important insight into how to present scientific concepts in a way that engages the audience and creates a connection. Businesses and advertising companies could benefit in incorporating components like color into their displays.

DEVELOPING AN OBJECTIVE MEASURE OF BREATHINESS
Meaghan Olger
Category: Communication Arts and Sciences, Section 3
Poster: 135
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): David Eddins (Communicative Science and Disorders), Lisa Kopf (Communicative Science and Disorders), Rahul Shrivastav (Communicative Science and Disorders)

Several diseases/disorders, such as malignant/benign vocal fold lesions, vocal fold paralyses, and neuromuscular disorders, can lead to changes in vocal quality (VQ). The current gold standard for assessing primary VQ dimensions is clinician judgment. Our laboratory is developing standard objective indices of VQ through the application of advanced perceptual measurement and signal processing techniques. VQ perception is quantified through custom-designed psychophysical tasks such as a single-variable matching task (SVMT). Unlike rating scales, a SVMT is not prone to various biases. Additionally, multiple responses are averaged for each stimulus to reduce the possibility of random errors in the task. The goal of the current study was to determine whether altering VQ along one dimension ("roughness") influenced perception along another dimension ("breathiness"). During the task, listeners were instructed to match two stimuli along a single dimension (breathiness). The first stimulus, the test stimulus, is of an unknown amount of breathiness. The second stimulus, the matching stimulus, is a complex sound composed of harmonics and noise. Its signal-to-noise ratio (SNR) is varied systematically in small steps until the breathiness of the matching stimulus matches the test stimulus. Nine listeners judged VQ for a set of synthetic voice stimuli using a SVMT. The results demonstrate that roughness had little influence on breathiness, and the matching data confirms that when aspiration noise in the test stimulus increased (associated with increasing breathiness), listener perception of breathiness also increased. Results will be used to scale the output of VQ models, achieving more accurate automatic estimates of VQ.

THE INCREASED COMPREHENSION OF SCIENTIFIC CONCEPTS WHEN EXPRESSED THROUGH AN INFOGRAPHIC
Cassidy Schultz
Category: Communication Arts and Sciences, Section 3
Poster: 136
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ryan Claytor (Art, Art History and Design), Julie Libarkin (Geological Sciences), Stephen Thomas (College of Natural Science)

Investigating the relationship between science and art can improve scientific communication by providing insight into the best practices for understanding of scientific concepts. Visual representations can impact factors such as emotion, cognition, or behavior of a subject, which will improve learning through increased comprehension. Therefore, art can be an effective way to convey scientific messages especially when expressing crucial scientific ideas to the community. My experiment consisted of creating an environmental infographic that incorporated diagrams, graphs, and other visuals to express a scientific concept. I have created a Mechanical Turk study consisting of multiple choice and open ended questions. The purpose of these questions was to evaluate the level of knowledge participants had of the scientific concepts covered in my infographic. I tested participants of their understanding of a concept before and after viewing my image, and then calculated statistical differences in a participant's knowledge as a result of viewing this image. In my presentation, I will discuss the objectives for the infographic and the mechanisms used to reach that objective. I will also present on whether or not my approach was effective based off of the data collected during the Mechanical Turk study. These results will hopefully show other researchers that presenting their findings through a more artistic or visually representative form will help to expand the public knowledge and understanding of their findings.

DEVELOPING AN OBJECTIVE MEASURE OF ROUGHNESS
Alissa Sheedy
Category: Communication Arts and Sciences, Section 3
Poster: 137
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): David Eddins (Communicative Sciences and Disorders), Lisa Kopf (Communicative Sciences and Disorders), Rahul Shrivastav (Communicative Sciences and Disorders)

Several diseases/disorders, such as malignant/benign vocal fold lesions, vocal fold paralyses, and neuromuscular disorders, can lead to changes in vocal quality (VQ). The current gold standard for assessing primary VQ dimensions is clinician judgment. Our laboratory is developing standard objective indices of VQ through the application of advanced perceptual measurement and signal processing techniques. VQ perception is quantified through custom-designed psychophysical tasks such as a single-variable matching task (SVMT). Unlike rating scales, a SVMT is not prone to various biases. Additionally, multiple responses are averaged for each stimulus to reduce the possibility of random errors in the task. The goal of the current study was to determine whether altering VQ along one dimension ("breathiness") influenced perception along another dimension ("roughness"). During the task, listeners were instructed to match two stimuli along a single dimension (roughness). The first stimulus, the test stimulus, is of an unknown amount of roughness. The second stimulus, the matching stimulus, is a complex sound composed of harmonics and noise. Its modulation depth is varied systematically in small steps until the breathiness of the matching stimulus matches the test stimulus. Nine listeners judged VQ for a set of synthetic voice stimuli using a SVMT. The results demonstrate that breathiness had little influence on roughness, and the matching data confirms that when modulation depth in the test stimulus increased (associated with increasing roughness), listener perception of roughness also increased. Results will be used to scale the output of VQ models, achieving more accurate automatic estimates of VQ.

BROADCAST, CABLE AND PUBLIC NETWORK NEWS COVERAGE OF THE 2012 U.S. PRESIDENTIAL ELECTION
Amanda Chodnicki, Rachel Droze
Category: Communication Arts and Sciences, Section 3
Poster: 138
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Geri Alumit Zeldes (Journalism), Fred Fico (Journalism)

The influence and power of the federal government shows a strong expansion with each year of fiscal and political growth. Along these lines, the importance and influence of the presidency has grown exponentially within the checks and balances of the federal government. Every four years, the time and effort put in by candidates for the presidency of the United States of America has been continuously and thoroughly covered by media giants and local newsrooms. As such, it is of crucial importance that the public be given as complete a picture as possible of each candidate. There are four members of our team, two of which have graduated, that performed a coding reliability test. From there, we were able to see which coders were reliable and which variables we struggled with. Now, our team has proven reliability and is able to begin coding. Our presentation will address the content analysis of 2012 presidential election stories broadcasted by ABC, CBS, NBC, CNN, Fox News and PBS during all weekly newscasts from Labor Day up to (but not including) Election Day. Study goals are: (1) to assess how evenly attention was given to the Republican and Democratic candidates for president; (2) to assess how the race and gender of the reporters covering the election affected their selection of sources, paying special attention to non-white and women sources; (3) to assess the strength and direction of influences on election coverage balance and on the use of women and minority sources.

POSTER PRESENTATIONS, SECTION 4
MOSAIC MULTIPURPOSE ROOM, 1:00-3:00 PM

CROSSING PATHS
Alexa Walkowicz
Category: Communication Arts and Sciences, Section 4
Poster: 140
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Cheryl Pell (Journalism)

Crossing Paths is a compilation of articles that I have written surrounding people who have affected my Freshman year at Michigan State University. Though I grew up 7 miles from campus, I still felt disconnected during my first year. The people featured in this project all connected with me on some level, sharing themselves with me and enabling me to go on. These stories cut across the diverse demographics of the Michigan State community. It will be published to iTunes as a Smart Phone publication. In order to put together this project, I interviewed and photographed my subjects, wrote and edited the stories, researched design principles for Smart Phones, designed the publication, and will publish it to iTunes, with the help of my mentor, Cheryl Pell. Crossing Paths is a portrait of my first year at MSU and the people who made it extraordinary.

EFFICACY OF VISUAL COMMUNICATION THROUGH THE SCIENCES
Andrew Gonynor
Category: Communication Arts and Sciences, Section 4
Poster: 141
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ryan Claytor (Art, Art History and Design), Julie Libarkin (Geological Sciences), Steven Thomas (College of Natural Science)

Scientific topics like water pollution are most often presented to the public in the form of infographics or text-based articles. The goals of this communication often focus on informing the audience about the topic, as well as eliciting an emotional change that will ultimately induce a change in behavior. This research focuses on the efficacy of artistic components present in comics in producing a change in emotion regarding a topic. The focus of this project is to assess the specific effects of the connecting emotions to an environmental problem to illicit an affective change. Eye-tracking data and interview questions are used to determine if subjects experience a shift in emotion after viewing a comic. Two treatments, a comic in black-and-white and the same comic in color, were used. Interviews provide evidence of people's emotions while working with the material, while eye tracking data provides evidence of attention to salient elements in the comic. Results provide important insight into how to present scientific concepts in a way that engages the audience and creates a connection. These methods are applicable in social moving and inciting actions for the greater good while connection with the individual.

WHEN A "KLEENEX" IS NOT A KLEENEX: THE USE OF PROPRIETARY EPONYMS AND ITS RELATION TO HOW WE THINK ABOUT MONEY
Rachel Wildt
Category: Communication Arts and Sciences, Section 4
Poster: 142
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Anna McAlister (Advertising and Public Relations)

This study is focused on determining the links between adults' brand awareness and their relationships with money. Participants included adults aged 18 – 64, some of whom were college students. Brand awareness was operationalized in terms of participants' frequency of use of proprietary eponyms. A proprietary eponym is a brand name or trademark that comes to be used as a term to reference an entire product category in day-to-day language (e.g., referring to any facial tissues as Kleenex). To assess their frequency of use of proprietary eponyms, participants were exposed to a series of 63 images, one at a time, and asked to name what they saw. Each participant's relationship with money was assessed using an established measure of fiscal personality. This measure yields scores on six scales (security, spontaneity, giving, carefree, status, and planning). A brief survey was used to assess various other factors such as age, gender, occupation, and media exposure. Overall, we anticipate that the more media exposure participants self-report, the more frequently they will use proprietary eponyms in the brand awareness task. We also anticipate that participants with high scores on the status and spontaneity traits of the fiscal personality assessment will be more frequent users of proprietary eponyms. We also specifically examine whether millennials differ from older adults in their fiscal personality or their brand awareness. The poster will display details on the study design and assessment tools, along with preliminary findings from a sample of at least 120 participants.

THE IMPACT OF CULTURE ON TWITTER-BASED BRAND MESSAGING STRATEGIES: A TWO COUNTRY STUDY
Samantha Ward, Katherine Brown, Lauren Davis, Heidi Kurniawan, Jennifer Zhou
Category: Communication Arts and Sciences, Section 4
Poster: 143
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Constantinos Coursaris (Media and Information), Wietske Van Osch (Media and Information)

In this study, we report the results of a multiple-case content analysis and cross-cultural comparison of Tweets by 2 brands advertising in both Japan and U.S. The selected brands, Tully's and Walmart/Seiyu, respectively represent specialty coffee shops and big box retailers. Findings of our study show the appropriation of content to the respective cultural context—Japanese and U.S.—across three dimensions, namely messaging strategy, content, and richness.

"SLOW DOWN IN THE TURN AND PLEASE VOTE FOR PEDRO": EXAMINING HOW VIRTUAL INSTRUCTOR IDENTITY INFLUENCES DRIVER PERFORMANCE AND PERSUASION
William Renius, Marshall Kroske, Tin Mong, Dane Rosseter
Category: Communication Arts and Sciences, Section 4
Poster: 144
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM

Mentor(s): Rabindra Robby Ratan (Media and Information), Young June Sah (Media and Information)

As information technologies were implemented in automobiles, drivers have more opportunities to interact with an artificial voice in for example navigation or driving assistant system. Especially when the artificial voice affords interactivity, users are likely to embody the voice by conjuring a mental image of the interaction partner. Despite the artificiality, users thus consider the voice as a social entity. Previous studies suggest that the mental image differs in its abstract-concrete level depending on its relevance to user. Drawing on these studies, we predict that when a car and virtual voice installed in the car reflects a user's identity they will induce a concrete mental representation. In a lab experiment, we examined how people perceive a virtual voice as well as car when the voice plays a role of an instructor in a parking simulation. Participants wore a head-mounted device and conducted several parking tasks under the virtual instructor's guides. We investigated if the virtual instructor and car reflecting self-identity led to a concrete construal and consequently greater persuasive influence of the instructor. Further we examined if participants' performance was affected by the perception of the car and virtual instructor. This examination provides implications on how people construe the virtual voice they interact with and car they drive and how the construal level is influenced by self-relevance. Moreover the results of the study suggest guidelines for the effective design of the artificial voice in car informatics.

USING AN INFOGRAPHIC TO CORRECT MISCONCEPTIONS IN BIOENERGETICS
Laura Azouz
Category: Communication Arts and Sciences, Section 4
Poster: 145
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ryan Claytor (Art, Art History, and Design), Julie Libarkin (Geological Sciences), Stephen Thomas (College of Natural Science)

Research has shown that videos that convey scientific concepts are more effective at promoting understanding when they include common misconceptions and their refutations than when they simply explain the scientific concept. This study examines this hypothesis for images. The results can help improve scientific communication with the public, as well as diagrams aimed at students. I tested two different designs for an image that conveys a concept that has been found to be widely misunderstood in bioenergetics—the storing of energy in covalent bonds, particularly in ATP—where one design focused on refuting misconceptions, and the other on exposition. The images were created with the aim to engage viewers cognitively, targeting knowledge and understanding, the first and second levels of Bloom's taxonomy. The success of the images at achieving this objective was measured by creating surveys that test subjects' understanding of bioenergetics before and after viewing the image. Surveys were administered through Amazon's Mechanical TURK system, an online marketplace where researchers can gather large amounts of data in exchange for a small fee from participants who are able to complete the task online anonymously. In my presentation, I will focus on my results, those aspects of the artistic representation of scientific misconceptions that I have found to improve viewers' understanding, and the ways those improvements can be applied in scientific communication.

THE SCIENCE OF DIGITAL MEDIA AND IT'S AFFECTS ON HUMAN INTERACTION
Mackenzie Proper
Category: Communication Arts and Sciences, Section 4
Poster: 146
Location: Mosaic Multipurpose Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ryan Claytor (Art, Art History, Design), Julie Libarkin (Geological Sciences), Stephen Thomas (College of Natural Science)

I am conducting research on the growth of digital media in individual's everyday lives. The research is concentrated on the science behind the correlation between the usage of social media outlets and screen-to-face time. This research is important because it can enlighten people on how the generational idea of "social" interaction has evolved, and actually derived away from genuine face-to-face interaction. The research will be conducted through a series of interviews, eye-tracking of images that present the information, and surveys through MechanicalTurk. I will present this information visually with the intent of cognitively challenging viewers to evaluate how the data is presented in their daily lives.

DIGITAL MEDIA

ORAL PRESENTATIONS, SECTION 1
LAKE ONTARIO ROOM, 9:00-10:30 AM

IMPACT SPORTS — THE FUTURE OF STUDENT PRODUCED SPORTS MEDIA
Alex Scharg

Category: Digital Media, Section 1
Location: Lake Ontario Room
Time: 9:00 AM-9:15 AM
Mentor(s): LA Dickerson (Journalism), Troy Hale (Journalism), Rick Wash (Media and Information)

An increasing number of students want to pursue sports media and journalism, but multidisciplinary experience is needed. Students need a variety of internships and experiences in video, audio, print, production, marketing, etc. to prepare for careers in a multimedia, convergent professional world of sports media. At the college landscape, student produced, extracurricular media is separate at many institutions — student newspapers, radio stations and television stations stand alone as media outlets. Impact Sports is a playground and hub for students to receive experience in a variety of disciplines while focusing on niche coverage of sports content. Students cover non-revenue sports like rowing and softball and cover the big revenue sports among the likes of hockey and football. Students also have the access to quality training in video, audio, print, marketing, communications and graphics that is insurmountable by a singular, existing student media outlet. The program produces masterful, multimedia young student professionals and creates successful alumni. In one year and six months, the website currently has over 100,000 pageviews and 30,000 users where students produce a variety of sports content. This concise media program is expandable into a student sports network at other universities. This can add innovation to the established extracurricular opportunities at universities.

FOCAL POINT TV NEWS
Daniel Hamburg
Category: Digital Media, Section 1
Location: Lake Ontario Room
Time: 9:15 AM-9:30 AM
Mentor(s): Bob Gould (Journalism)

Focal Point is the only student-produced, Emmy award winning newscast at Michigan State University. We record newscasts 12 times per school year in the studios in the Communication Arts and Sciences Building. Not only does the show provide news and information to the MSU and Mid-Michigan communities, but it also gives students the opportunity to learn about broadcasting in all forms: reporting, shooting, editing video and writing. The anchors and reporters for the show are comprised of students enrolled in the advanced broadcasting class, JRN 406, with additional content from the beginning broadcast class, JRN 403, and a group of dedicated volunteers. As the producer I help put together 30 minute bi-weekly newscasts by assigning stories to reporters, ordering the rundown, writing scripts, editing in Avid Media Composer and troubleshooting technical problems. I also assist in shooting and writing various video packages for the show, and publicizing the show on our website and across social media platforms. This presentation will include video clips from our shows, and a discussion about what it takes to produce Focal Point on a regular basis.

IMPORTED FROM CHINA
Anna Shaffer
Category: Digital Media, Section 1
Location: Lake Ontario Room
Time: 9:30 AM-9:45 AM
Mentor(s): Geri Zeldes (Journalism)

This documentary, created by a team of journalism and other Comm Arts students and led by Academic Specialist Troy Hale and Associate Professor Geri Zeldes Alumit, follows several Chinese international students who are grappling with finding a place in American Universities and within the larger U.S. context. The film demonstrates how relationships are nurtured and shaped across cultural boundaries. “Imported from China” is also a snapshot of the largest demographic shift in the university's history. In 2006, only 96 undergraduate students at MSU were from China. This fall, the numbers are expected to soar to more than 4,000 or 13 percent of the undergrad population. This means one out of eight undergrads will be from China. Colleges and universities throughout the country are seeing an influx of students from China. Of the top 20 universities with the largest number of Chinese international students, eight are from the Big Ten.

UNCHECKING THE BOX FILM
Gabriela Saldivia, Lindsay Benson, Dakota Johnston, Caitlin Parks
Category: Digital Media, Section 1
Location: Lake Ontario Room
Time: 9:45 AM-10:00 AM
Mentor(s): Bob Gould (Journalism), Geri Zeldes (Journalism)

Our film, Unchecking the Box, explores why we put people into racial “check” boxes, and how that affects their identity. When we put people into boxes, we limit them and ourselves. People are more dynamic than just one box. Our goal in this film is to enlighten people about the complexity of racial identity in America.

A CONNECTION

Archit Batra, Anya Rath, Abhilasha Singh
Category: Digital Media, Section 1
Location: Lake Ontario Room
Time: 10:00 AM-10:15 AM
Mentor(s): Amol Pavangadkar (Media and Information)

In order to tell a good truthful story, one should live through it, especially when it comes to telling the story of a culture. This is the strategy that a group of students undertook in order to produce a Bollywood-style short film. As part of their study abroad trip to India to learn about that film genre, the students underwent a full cultural immersion, ranging from visits to touristic sites to attending a traditional Indian wedding, riding rickshaws and interacting with women filmmakers from the lowest social caste in India. The students tried to pack their month-long experiences in a film telling the story of a connection between an American travel photographer in India and an Indian girl. Through their interaction, the film examines tradition in its various aspects to explain the essence of Hinduism and Indian culture. In addition, the students gained great experience through the use of professional equipment and sets they had access to at Ramoji Film City in Hyderabad.

BEYOND BOLLYWOOD- BEHIND THE SCENES
Nourhan Dakroury, Alyssa Cleland
Category: Digital Media, Section 1
Location: Lake Ontario Room
Time: 10:15 AM-10:30 AM
Mentor(s): Amol Pavangadkar (Media and Information)

Our trip to India was a grand cultural immersion. For a lot of us, it was an incredibly different experience. The study abroad experience helped us open our eyes to issues and perspectives that we hadn't considered or looked at before, like how people from different cultures interact with foreigners or how we ourselves cope with change. In order to reflect on our trip and what we all learned from it, we produced a documentary about our experiences all throughout the trip, from the minute we arrived in India to when we were wrapping up our production. We interweaved interviews that we held after we got back from India with the footage we collected throughout our trip to dissect our experiences. While in India, our cameras never left our sides and would only be switched off while we were sleeping. We were also constantly interviewing each other and self-interviewing to be able to capture and contrast what our thoughts during the experience were with our thoughts after we've had the time to take everything in. Apart from the Bollywood production, we had a packed schedule including sightseeing and interacting with local people to get an idea of the culture and the life in India.

ORAL PRESENTATIONS, SECTION 2
LAKE ONTARIO ROOM, 11:00 AM - 12:30 PM

"THERE'S SOMETHING HAPPENING HERE..."
Daniel Hamburg
Category: Digital Media, Section 2
Location: Lake Ontario Room
Time: 11:00 AM-11:15 AM
Mentor(s): Henry Brimmer (Advertising and Public Relations)

"there's something happening here..." is the title of Professor Henry Brimmer's entry into the 2014 ArtPrize competition in downtown Grand Rapids, Michigan. Following the construction and installation of multiple figures high above Grand Rapids, I captured the moments that it took to bring everything together, and the reactions that followed from people on the streets below. This presentation will include a screening of the documentary and I will answer questions about the making of the film.

GCFSI TRANSLATIONAL RESEARCH
Alyssa Cleland, Will Landreth
Category: Digital Media, Section 2
Location: Lake Ontario Room
Time: 11:15 AM-11:30 AM
Mentor(s): Amol Pavangadkar (Media and Information)

The Global Center for Food Systems Innovation, or GCFSI, undergoes an ongoing effort to research and come up with solutions to tackle future issues that could arise in regards to food security. Countries like Malawi could be facing problems in the future regarding water availability and crop sustainability. Under the center, researchers are working on different issues, like rain season change and water variability in Malawi and producing educational videos to teach farmers in rural Kenya how to use cell phones efficiently to help them plan and sell their crops better. To break the research down and explain its purpose, goals and methods, we found that it would be more comprehensive if we produce videos explaining the various research topics and to make the information more accessible. The videos would explain what GCFSI means and what it does as well as the "Megatrends" or the three global trends GCFSI has identified and categorized the research accordingly. Those trends are broken down into climate change, urbanization and skills innovation. As our job as translational scholars, we form questions that would

help both the USAID and the general public understand the impact of such research on global population, especially those in the global south and help them avoid any future food insufficiency.

A CONNECTION BEHIND THE SCENES
Archit Batra, Abhilasha Singh
Category: Digital Media, Section 2
Location: Lake Ontario Room
Time: 11:30 AM-11:45 AM
Mentor(s): Amol Pavangadkar (Media and Information)

The production of the Bollywood- style short film A Connection was a process that was different for most of us. For some of us, this experience presented the first time we have ever set foot on a set, let alone ones that were professional sets used in Bollywood movies. Since it was one of the most important aspects of our study abroad trip to India, reflecting on it and documenting it was important for us in order to look back on the progress that we made and examine it in a more reflective way. The video examines the pre-production period, the production and the post-production of the short film, in addition to post-trip interviews reflecting back on the process.

STORYTELLING WITHIN SPORTS: WHAT'S YOUR STORY?
Scott Wasserman
Category: Digital Media, Section 2
Location: Lake Ontario Room
Time: 11:45 AM-12:00 PM
Mentor(s): Amol Pavangadkar (Media And Information)

Over the past year, I have had the opportunity to create videos showcasing the stories of Michigan State University student athletes. In partnership with WDBM Impact Sports, one of the pieces I produced, filmed, and edited was "Josh Barens: Determined," a short documentary about a MSU Men's Soccer player who has battled multiple injuries in order to return to the game that he loves. Over the past year, I have learned that finding the next story is an exciting beginning, but the pieces that are uncovered throughout the journey is even more powerful.

COMMUNITY CELEBRATIONS- CHINESE NEW YEAR
Nourhan Dakroury, Dan Wogan
Category: Digital Media, Section 2
Location: Lake Ontario Room
Time: 12:00 PM-12:15 PM
Mentor(s): Amol Pavangadkar (Media and Information)

There is no denying that the Chinese community is large and has been rapidly growing in the greater Lansing area within the last few years. Whether they're students or just residents, Chinese people have their own traditions that they like sharing with other community members to showcase the rich culture and heritage they have. One such celebration is the Chinese New Year or what is also known as the Chinese Spring Festival. Examining what kinds of traditions that are related to the holiday and also trying to determine what year is it, the year of the goat or sheep- we captured footage of two different Chinese New Year events and asked people about their experiences with the tradition. One important aspect we focused on also, was how different the celebrations here are from those in China, in addition to the importance of being with family, friends or both on that day.

DIWALI COMMUNITY CELEBRATION
Anya Rath, Dan Wogan
Category: Digital Media, Section 2
Location: Lake Ontario Room
Time: 12:15 PM-12:30 PM
Mentor(s): Amol Pavangadkar (Media and Information)

Understanding a culture is tough when one isn't exposed to aspects of it, but the Greater Lansing community is fortunate enough to have a diverse population to showcase the various traditions associated with the different cultures. One such tradition is the celebration of the Indian festival of lights or Diwali. The community celebration comes with various religious as well as cultural and social traditions that our video looks into and examines through getting the accounts of people who have Indian heritage as well as priests who prepare for the holiday. It was important for us to examine the difference between celebrating the holiday in India as opposed to celebrating it in the U.S. while focusing on the importance of keeping the tradition of celebrating the holiday.

ORAL PRESENTATIONS, SECTION 3
LAKE ONTARIO ROOM, 1:00-2:15 PM

SEEING CHINA: PHOTOGRAPHIC VIEWS AND VIEWPOINTS
Marisa Hamel, Jordan Jennings
Category: Digital Media, Section 3
Location: Lake Ontario Room
Time: 1:00 PM-1:15 PM
Mentor(s): Howard Bossen (Journalism), Eric Freedman (Journalism)

Seeing China: Photographic Views and Viewpoints at the Michigan State University Museum is an exhibition of photographs by Steven Benson, Luis Delgado, Laurie Lambrecht, Fredrik Marsh, Philipp Rittermann and Brad Temkin, which delves into the social repercussions of environmental, architectural and cultural changes in China. Major water projects such as the Three Gorges Dam inspired these photographers to document vanishing communities dotting the Yangtze River and China's Grand Canal, as well as rapidly changing cities across the country. Our responsibilities as part of a museum team for the project included helping to select and sequence photographs for the gallery based on geography, aesthetic appeal, message and perspective. We wrote press releases and articles to inform the public following the opening of the exhibition in January. Much time was devoted to researching information about the photographers and some individual images to write biographies, photo captions and content for publications. We created contextual information about the environmental and social histories of the areas photographed, and calculated photograph dimensions to determine wall placements, total number of images and shipping and packaging costs. We also indicated photographs' locations on a map of China, which a designer then used to provide visual clarification in the museum space. Currently, we are documenting the photographers' lectures on campus and community discussions until the exhibition closes in August 2015.

JOHN GEORGE: ONE MAN'S FIGHT TO SAVE HIS CITY
Alexandra Tekip
Category: Digital Media, Section 3
Location: Lake Ontario Room
Time: 1:15 PM-1:30 PM
Mentor(s): Sue Carter (Journalism)

John George has been ridding Detroit of blight long before it became a trend. As the founder of the Motor City Blight Busters, George has spearheaded efforts to clean up his neighborhood in Northwest Detroit. His dedication to his cause has brought him national attention, but it was no easy journey. George has made sacrifices and come from nothing to get where he is today. This mini-documentary explores George's accomplishments, hardships and his unwavering passion for the city of Detroit.

COOMUNITY CELEBRATIONS- MSU GLOBAL FESTIVAL
Will Landreth, Ben Webber
Category: Digital Media, Section 3
Location: Lake Ontario Room
Time: 1:30 PM-1:45 PM
Mentor(s): Amol Pavangadkar (Media and Information)

MSU is known to be one of the most diverse universities nationwide, housing one of the largest international student populations in the country. To celebrate the diversity and the cultural differences, we set out to produce a story on the MSU Global Festival. The video produced for WKAR television station is part of a series of community celebrations around the greater Lansing area. The video examines how the community prepares and benefits from the event. We also talked to students about how important it is for them to share their culture with the community and how they feel that the community gained through this annual event.

MAPLE SYRUP FESTIVAL COMMUNITY CELEBRATION
Jessica Niskar, Allison Yoon
Category: Digital Media, Section 3
Location: Lake Ontario Room
Time: 1:45 PM-2:00 PM
Mentor(s): Amol Pavangadkar (Media and Information)

Looking at what brings the community together is always very interesting. Whether it's a specific holiday, ethnic tradition or just food, examining why it is important for them to gather for celebrations is essential to understanding the community as a whole. Focusing on a more American tradition, we set out to examine why different factions of the community gather for an annual maple syrup festival. Although the event is more local than it is global, it illuminates ideals and traditions that its participants value. Community members shared in the annual festival to learn more about the process behind the production of maple syrup, which is a North American staple.

THE LIVING HISTORY PROJECT: STORIES TOLD BY MICHIGAN'S OLDEST OLD
Andrea Raby, Gabriela Saldivia, Carmen Scruggs, Anna Shaffer

Category: Digital Media, Section 3
Location: Lake Ontario Room
Time: 2:00 PM-2:15 PM
Mentor(s): Geri Zeldes (Journalism)

Those who are 85 and older have a story to tell that impacts us all. Their story is history — a history that many of us have only read in books. They lived through the Great Depression and the Second World War. They saw the civil rights movement and witnessed the first black president get elected into office. In total, they have seen 7 wars, 13 presidents and 45 Olympic games. They have taken part in fashion and fads and watched technology change their life as they knew it. They have stories that need to be shared because they have seen things that we will never see. We don't want these stories to be lost. The Living History Project is a digital multimedia project dedicated to documenting and sharing the stories of those 85 and older in Michigan. We want these stories to live on so we can continue to remember and learn from the past.

EDUCATION

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

MENTORING FOR NEW EDUCATORS
Megan Campbell
Category: Education, Section 1
Poster: 149
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Nathan Burroughs (Center For The Study Of Curriculum)

This research project seeks to evaluate the mentoring that first and second year educators are currently receiving. Information consists of math educators who teach primarily in Texas and come from different types of certification programs. This research will evaluate who is being mentored and the quality of mentoring given the constraints of the data. This research will look for differences primarily seen amongst the grade levels the educators teach at and based on whether they went through a traditional certification program or an alternative route program.

SCHOOL BOARD DONATIONS: FLOOD OF CASH FROM WEALTHY DONORS
Ritu Narayan
Category: Education, Section 1
Poster: 150
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Rebecca Jacobsen (Teacher Education)

Michael Bloomberg, Bill Gates, and Eli Broad…What do these people all have in common? Not only are all of these individuals billionaires, but all have donated heavily to a common issue: school boards. Many wealthy donors have recently become involved by donating to school board candidates outside of their city. Although a seemingly positive thing, this flood of cash uncovers a list of problems, including the push for privatization and charter schools, and the worry that these donations are aimed at electing like-minded public officials, skewing the integrity of the democratic process. By examining four different cities (Denver, New Orleans, Bridgeport, and Los Angeles), this research project aims to investigate how billionaires are shaping local school board elections. Specifically, this work examines who is donating to school board candidates and how much, which candidates are receiving donations, and if they are receiving more in-state donations or more out-of-state donations. Campaign finance data gathered from each election in each city was used to examine these questions. Microsoft Excel was used to create a spreadsheet that organized the data by election and noted which donors gave to which candidates, where the donors are from, and how much was given. These data were then entered into UCINET/NetDraw to visually represent the connections between donors and recipients. These demonstrate that overall, there was an increase in donors who donated in multiple cities. These findings are important in their ability to show the increasing degree to which wealthy individuals are controlling school board elections.

BIOLOGY CENTRAL DOGMA: WHAT ARE THE STUDENT LEARNING CHALLENGES?
Alexandria Mazur
Category: Education, Section 1
Poster: 151
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): John Merrill (Microbiology and Molecular Genetics), Rosa Moscarella (College of Engineering), Mark Urban-Lurain

(College of Engineering)

When students' ideas about scientific concepts are assessed through writing in their own words (Constructed Response; CR) rather than selecting from a list (Multiple Choice; MC), their thinking and understanding can be better revealed. The Automated Analysis of Constructed Responses (AACR) research group investigates student constructed responses using computerized tools that automate the otherwise resource intensive task of scoring. A review of the difficulties revealed by students' writing can then be used to guide teaching intervention to address those issues. Many students struggle to master genetic concepts, particularly the Central Dogma of Molecular Biology. Central Dogma encompasses the replication of DNA, transcription of DNA to RNA, and the translation of mRNA to proteins. We administered a constructed response question to assess students' understanding of Central Dogma as on-line homework to an introductory biology course at a large research university in the US. A case study activity focusing on Central Dogma was used in class to demonstrate the application of these concepts. Analysis of pre/post CR responses revealed a learning gain for replication and translation, but not for transcription. We conducted interviews to i) identify why student comprehension of transcription did not improve and ii) validate the ideas present in the students' writing. We are analyzing the interviews using qualitative, grounded theory methods. Our constructed response analysis, confirmed and elaborated by interview data, suggest that additional or revised instruction particularly concerning transcription could be fruitful in improving students' accuracy of thinking about the Central Dogma.

EFFECTS OF TIME AND NOVEL STIMULI ON PREFERENCES OF CHILDREN WITH AUTISM SPECTRUM DISORDERS
Jessica Osos
Category: Education, Section 1
Poster: 152
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Joshua Plavnick (Counseling, Educational Psychology and Special Education), Julie Thompson (Counseling, Educational Psychology and Special Education)

Identifying potent reinforcers for nonverbal children with severe Autism Spectrum Disorder (ASD) can be very difficult, yet is essential to effective instruction. Procedures that allow for empirical ranking of items from most to least preferred are therefore important, but must account for changes in preference that can occur over time and with the introduction of novel stimuli. This study examined if preference changes over time (by hours and/or week) and the effects of novel stimuli on preference of nonverbal children with Autism Spectrum Disorder. Four nonverbal children with severe ASD participated in the study. Multiple stimuli without replacement preference assessments were conducted one day each week with multiple trials per day across four weeks within a self-contained elementary Autism Spectrum Disorder classroom. The results further support the need for frequent preference assessments with varied stimuli among nonverbal children with severe ASD.

PEDAGOGICAL GRAMMAR
Samantha Kirby
Category: Education, Section 1
Poster: 153
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Dustin De Felice (Center for Language Teaching Advancement)

Throughout recent years, the growing population of English language learners has increased the need for good grammar instruction. "The challenge has been finding a way to convey the essentials of American English grammar clearly, to engage students actively in their own learning and understanding of grammar as applicable to ESL/EFL learners, and to motivate them to undertake perceptive analyses of grammatical elements and structures, and of ESL/EFL learner needs and difficulties" [De Capua, 2008, p. iii]. Through looking at research and theories, I have developed activities to help improve the grammar instruction to English language learners and all students. English language learners have a more difficult time learning the language because language is believed to be innate. There are habits and rules that are picked up without direct language instruction. I have created 5 student activities to aid in the development of language and grammar. They help students develop grammar rules and include discussion. Through these activities, English Language learners will improve their language development because of the research and theories that are based on.

PRESSURE-SENSITIVE FLOOR FOR TEACHING COMPUTER LITERACY
Eric Boerman
Category: Education, Section 1
Poster: 154
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Allison Dobbins (Theatre)

As computers continue to become an increasingly integral part of society, there is an increased emphasis in education on fostering computer literacy. This project is one part of a collaborative interdisciplinary effort, involving both the sciences and

humanities, to create an interactive environment in which elementary-aged students are able to learn basic computing concepts such as variables and conditionals in an intuitive, age-appropriate manner. To that end, we aim to develop a pressure-sensitive floor which will allow students to receive real-time feedback as they move about a grid of colored tiles and complete program-style tasks. Each grid square will be able to detect the weight of a student standing on it and relay that information to external devices such as lights that will respond to reward participants for success or warn of failure, with the end goal of using audiovisual cues to reinforce correct program execution. The focuses of construction for the floor are sensitivity, reliability, durability, and ease of transportation; to that end, multiple designs are being tested. Once the floor is complete, students will be able to move from tile to tile according to a set of provided instructions. As they perform simple computing tasks such as interpreting If statements and variable statements, the floor will determine their position and respond appropriately. All of this is in pursuit of the project's end goal, which is to provide young students with an immersive and easy-to-understand introduction to basic computing.

ARE POINT VALUES ASSOCIATED WITH THE AMOUNT OF EFFORT PUT FORTH BY DIFFERENT KINDS OF STUDENT LEARNERS?
Molly McNamee
Category: Education, Section 1
Poster: 155
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Tammy Long (Plant Biology)

Expectancy-value theory predicts an increase in motivation for students to perform well on sections of an exam that have higher point values associated with them. Previous work has found that increasing the point value on assessment questions will lead students to put more effort into them, but that effort does not necessarily correlate with higher quality responses. Our study examines point value of an assessment as a predictor of student effort and response quality. In addition, we ask whether the influence of point value differs among students classified as deep, superficial, or strategic learners, as indicated by their responses on the Approaches and Study Skills Inventory for Students (ASSIST). We quantified student effort as word count and assessed quality using a performance rubric. We expect point value to have a larger effect on strategic and surface learners than deep learners, and that deep learners will outperform superficial and strategic learners. If it is found that point values are associated with the amount of effort that certain kinds of students put forth then consideration should be taken to the bias that they may create in the student population.

ANALYZING EQUITY IN COLLABORATIVE LEARNING SITUATIONS
Emily Pearce, Ciara Jackson, Declan McClintock
Category: Education, Section 1
Poster: 156
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Niral Shah (Teacher Education)

The focus of the research was to investigate how race and gender affected the perception upper elementary school students had of their classmates in Northern California who participated in a three-week elementary computer science program. The data we looked at came from interviews with the students. Students were asked on the second day of the program and again on the eleventh day about who they knew before the program, who they would want to play with and who they would want to take a test with. Based on societal stereotypes of computer science, we expected males and Asian students would be picked the most in the play and test categories. What we found was that race was not a significant factor in choosing a partner, but had contradictory results in the gender category. Next, we will investigate how race and gender affect the interactions between students.

HEAD START TEACHER'S BELIEFS AND PRACTICES FOR SUPPORTING LETTER KNOWLEDGE IN PRESCHOOL: INDIVIDUALIZATION MEANS MEETING CHILDREN WHERE THEY ARE
Susima Weerakoon
Category: Education, Section 1
Poster: 157
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Hope Gerde (Human Development and Family Studies)

Increasing school readiness is an identified goal of many early childhood education programs, including Head Start, the largest federally funded early childhood program in the country, serving over one million young children living in poverty (Powell, 2013). Early literacy skills, particularly the ability to name letters, is the strongest predictor of school readiness and later reading achievement (National Early Literacy Panel, 2009). Unfortunately, children living in poverty tend to know fewer letters than their wealthier peers (Diamond, Gerde, & Powell, 2008), placing them at risk for reading difficulties (Norwalk, DiPerna, Lei, & Wu, 2012). The need to understand the beliefs and practices Head Start teachers use to promote letter knowledge is essential,

because teachers' beliefs influence their practices (Stipek & Byler, 1997). This study examines teacher beliefs and reported practices for promoting letter knowledge. Researchers interviewed 49 preschool teachers, within the Ingham county area, then transcribed the interviews and utilized constant comparative analysis (Strauss & Corbin, 1999) to code the responses. The findings of this study indicate that most teachers report using individualization practices (e.g., focusing on the letters in an individual child's name), which previous research has found to be critical for successfully promoting literacy skills for young children (Connor et al., 2009; Whitehurst & Lonigan, 1998). Also, teachers reported that children's interest in learning about letters relied on either a child bringing their own inherent interest in letters to school from home, or teachers could create interest through the use of meaningful teaching strategies and individualization.

POSTER PRESENTATIONS, SECTION 2
SECOND FLOOR CONCOURSE, 1:00-3:00 PM

TECHNOLOGY IN THE CLASSROOM: GOOGLE DOCS
LeeAnn Connelly
Category: Education, Section 2
Poster: 159
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Kate Fedewa (Writing, Rhetoric, and American Cultures), Kathryn Houghton (Writing, Rhetoric, and American Cultures)

Technology is a staple in the workforce. As such, it has become a common factor in the college classroom. In addition to their instruction, professors are exposing students to technologies such as Google Drive, which allows students to cooperate simultaneously and remotely. This technology has the possibility to change the way students approach a project. In this paper I will focus on students' use of Google Drive to cooperate in team environments. The use of Google Drive may change the nature of academic group work, as it allows a team to coordinate efforts remotely. Specifically, I will ask if the use of Google Drive instead of traditional teamwork methods has a positive or negative effect on the organization and work ethic of students working in a team. By observing student behavior and analyzing interviews and surveys, I will identify the ways students organize themselves and their groups when using Google Drive versus when using traditional methods. I will follow the progress of multiple groups throughout the semester: groups using Google Drive and groups not using it. Though surveys, personal interviews, and observation I will track their group organization and division of duties, levels of individual participation, and personal satisfaction with the results. I hope to argue that the use of Google Docs to organize a group assignment leads to a more organized workflow and higher levels of participation from the group as a whole. This research will suggest increased exposure to Google Docs as a teamwork resource in university-level programs.

YOUNG AUTHORS' CONFERENCE
Lauren Link
Category: Education, Section 2
Poster: 160
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Kate Fedewa (Writing, Rhetoric, and American Cultures)

Whether it is due to student-teacher mismatch, lack of interesting topics, or another reason, it seems that one of the most dreaded academic tasks is writing. I am interested in how and why a human's attitude toward writing transitions from initial excitement upon first learning words during childhood to tedium in young adulthood. My goal is to identify key factors that influence students' opinions on writing in order to promote practices that encourage positive attitudes toward the practice of writing. My research focuses on the development of a person's attitude toward writing from adolescence to young adulthood. I ask what happens in a classroom that affects students' attitudes toward writing, especially the trend of attitudes toward writing becoming negative as age increases. I use secondary resources available online and in print, including scholarly articles analyzing classroom instruction and practices that affect student attitude toward writing. I then supplement this base of knowledge with primary resources, including lesson plans developed by teachers and professors as well as interviews with college-level students, in order to gain a firsthand perspective of influencing factors of attitude toward writing. I will use my findings to aid the Department of Writing, Rhetoric and American Culture in their implementation of the Young Author's Conference, held at Michigan State University each summer. The goal is to make writing more enjoyable for young adults.

WHAT WOULD YOU DO? EXPLORING STUDENTS ATTITUDE AND BELIEFS ABOUT WRITING INSTRUCTION
Khadija Houston
Category: Education, Section 2
Poster: 161
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Janet Swenson (College of Arts and Letters)

Teaching is a field in which educators must constantly assess what works well, and what needs improvement within their classroom instruction and dynamics. Through Project WRITE III, a program where teachers research, discuss and implement practices in the teaching of writing to increase student engagement, learning and academic achievement my research was conducted. 159 freshmen, and 184 seniors at "High School A" are given a survey about their beliefs and attitudes towards writing and their typical writing instruction. Participants are given ten questions to answer, which range from their general enjoyment of writing, writing on social networks, whether sharing their writing with others is problematic, to the amount of writing they do within their English classrooms. Given the results of the surveys, the teachers of School A are interviewed about which questions they find the answers to have been most shocking, what methods will they turn to for assistance in remedying the problem, and most importantly how much will the students surveys effect their class instruction. The overreaching research lies within the question of, how do students attitudes and beliefs about writing effect how they are taught, and does that effect the decision making of teachers? In this interactive presentation, I will show the importance of surveying students to improve their learning and enjoyment within English-Language Arts instruction.

EXPLORING THE CHARTER SCHOOL DEBATE
Laura Bauermeister
Category: Education, Section 2
Poster: 162
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Sarah Reckhow (Political Science)

Charter schools became a key topic for debate in the field of education when they gained popularity in the 1990s. Since then, political parties and politicians have viewed charter schools as a bipartisan solution that contributes to educational reform. As the debate has become less politically charged at the national level, charter schools continue to influence state and local level politics. This research project is designed to analyze the discussion of charter schools since the year 2000 by looking at testimony during congressional hearings of state and local level politicians and citizens. Each hearing is classified by the structure of the debate; these categories include charter schools for educational innovation, charter schools as a market or choice based reform, charter schools as a strategy for at-risk students, and charter schools as a citywide or district wide reform. Every testimony on charter schools is then classified as having a positive, negative, or neutral opinion of charter schools. Speakers' direct statements are used as supporting evidence for these classifications. This data is then used to analyze how opponents and supporters of charter schools frame their arguments. Understanding the structure of the modern charter school debate is key in moving forward with tested and successful solutions that can contribute to educational reform across the country.

EXAMINING RISK AND PROTECTIVE FACTORS IN AT RISK PRESCHOOLERS ACROSS A TWO-YEAR SPAN
Caitlin Lacey, Keegan Johnson, Brette Smith
Category: Education, Section 2
Poster: 163
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): John Carlson (Counseling, Educational Psychology and Special Education)

This poster presentation addresses the paucity of research examining the prevalence of risk and protective factors in preschoolers whose poverty status places them at increased risk for later behavioral problems (Qi & Kaiser, 2003). Data was obtained as part of enrollment material in Head Start schools from 1,351 parents of children, with an average age of 49.6 months, using the Devereux Early Childhood Assessment (DECA) in the academic year 2014-2015. Out of the 1,351 children who were rated, 260 students reoccurred from the DECA parent ratings from the academic year 2013-2014. Of the 260 reoccurring students, 62 students were rated at risk in protective or behavioral factors in 2013-2014. Through this analysis of data we will 1) describe how the preschooler who was at risk for externalizing protective or behavior problems in the 2013-2014 academic year scored on a parent-rated survey that measures risk and protective factors 2), and compare those protective and behavioral factor scores of these at risk students to the scores of their 2014-2015 parent rated survey in order to identify areas of change or consistency over the course of a year. This poster benefits educators, especially those in Head Start populations, by acting as a tool that highlights students progress and areas of need over an academic year, so that Head Start facilitators can address children who are at risk for protective and behavioral problems, and can design classrooms and instructional strategies that promote healthy growth of students socio-emotional needs (LeBuffe & Naglieri, 1999).

QUESTIONS IN THE CLASSROOM: HOW OFTEN DO STUDENTS RESPOND?
Sonny Ly
Category: Education, Section 2
Poster: 164
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Sarah Jardeleza (Center for Integrative Studies in General Science), James Laverty (CREATE for STEM Institute),

Becky Matz (CREATE for STEM Institute)

Interacting with students is a common technique for teachers of any subject to help students learn. One way of doing this is by asking questions and probing for students to respond. Here at Michigan State, we are currently engaged in a transformation to improve the introductory courses in biology, chemistry, and physics. As part of this project, we recorded instructors teaching these classes to investigate different facets of the way these courses are being taught. Two areas that we are looking into is the frequency with which an instructor asks students non-rhetorical questions and when students speak out loud to the class. This presentation will focus on the overall frequency of "Instructor Questions" and "Student Talking" codes, as well as correlating the occurrence of these codes with what else is going on in the class (e.g. clicker questions). This information will be tracked as the transformation effort moves forward in order to help characterize the results of the transformation process.

THE SOCIAL CONSTRUCTION OF SCIENTIFIC KNOWLEDGE IN THE CLASSROOM: AN INTERDISCIPLINARY ANALYSIS
Marie Kaniecki
Category: Education, Section 2
Poster: 165
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Eric Aronoff (Residential College of the Arts and Humanities)

The manner in which scientific knowledge is constructed in our society shapes the way that science is communicated and taught, as well as the way that it is practiced. The standard construction of scientific knowledge creates divisions and obstacles for the possession of scientific knowledge and meaningful participation in science. Yet, at the same time, this construction of knowledge is essential to the practice and study of science. My research was conducted through analysis of relevant literature, including textbooks and syllabi from chemistry courses I have taken at MSU, and participant observation from my perspective as a chemistry and humanities student. In this presentation, I will explore how scientific knowledge is constructed in educational settings, with a focus on university level courses. Furthermore, I will dissect the implications of this construction in terms of the communication of scientific ideas and concepts, meaningful participation in science, and possession of scientific knowledge.

USING SOCIAL MEDIA TO PROMOTE WRITING INSTRUCTION TO A YOUNG AUDIENCE
Sarah Anderson
Category: Education, Section 2
Poster: 166
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Kate Fedewa (Writing, Rhetoric, and American Cultures)

The purpose of my research is to discover how to use social media to engage a young audience and how to adapt and promote writing instruction for social media in the most engaging way. To accomplish this goal, I have been researching the human attention span and the way the brain processes information. I have also studied the strategies of successful social media marketing campaigns for young adults and compared social media sites for other young authors conferences to the MSU YAC page. So far, I have come to the conclusion that activities/contests and visuals such as photos, videos, and infographics are the most effective way to engage young followers and promote writing instruction in a limited space. Moving forward, I will test this theory by creating a survey to discover the preferences of young adults on social media and by studying the amount of engagement with visuals on social media and whether or not the time of day seems to have an effect. By revealing how to make writing instruction on social media as engaging as possible for young adults, my research will help the MSU YAC social media pages better connect with their audience and increase the number of young authors who attend the conference.

POSTER PRESENTATIONS, SECTION 3
SECOND FLOOR CONCOURSE, 1:00-3:00 PM

DRAWINGS AS A WINDOW INTO CHILDREN'S FEELINGS ABOUT INSECTS
Nicole Fisher
Category: Education, Section 3
Poster: 169
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Julie Libarkin (Geological Sciences), Amanda Lorenz (Entomology)

In this study, 163 elementary students in 1st through 4th grade were given surveys before and after engagement in an insect-specific curriculum aligned with current educational standards. The insect curriculum was coupled with the addition of live insects as classroom pets in four out of six total classrooms. The remaining two classrooms served as controls and did not receive live insects, but did participate in the insect-themed curriculum. Student surveys measured student understanding of and attitudes towards insects. Specifically, the survey asked students to draw a picture of an insect, describe the insect they had drawn, and answer questions about their feelings towards insects. For analysis, drawings will be deconstructed into their

salient features and each drawing will be analyzed for presence/absence of these features. Factor analysis will be used to identify any underlying models of insects present in the population. In particular, we are interested in positive and negative characterizations of insects and whether negative characterizations could be altered by exposure to the live insect pets and/or participation in the insect curriculum. This study has potentially wide reaching applications in that it will shed light on the impact of a targeted curriculum on attitudes toward insects.

A POWERFUL PARTNERSHIP: THE INTEGRATION OF PROSPECTIVE MATHEMATICS TEACHERS IN A DEVELOPMENTAL MATHEMATICS COURSE
Kayla Cotter, Laura Mularski
Category: Education, Section 3
Poster: 171
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Kristen Bieda (Teacher Education)

The aims of the TEAM research project are to simultaneously improve the mathematical future of students in a hybrid developmental mathematics course (MTH100E, a subsection of MTH1825), while offering prospective secondary mathematics teachers enrolled in TE 407 valuable teaching experience to become effective teachers of mathematics for all learners. MTH1825 is an online, non-credit-bearing class that uses software to help struggling mathematics students prepare for college-level mathematics. MTH100E is a face-to-face component offered to those most at risk for not passing their freshman level classes. Typically, MTH 100E classes are taught by undergraduate learning assistants in a small classroom setting. Our project integrates undergraduate TE 407 students, future secondary mathematics teachers, as instructors in one section of MTH 100E. TE 407 students create lesson plans in pairs and are given two opportunities to implement these lessons under the supervision of two experienced graduate assistants. The curriculum used in this section is inquiry-based and designed to build MTH 100E students' conceptual understanding. The project is collecting data about what the MTH 100E students learn about mathematics as well as what the TE 407 students learn about teaching; evidence collected includes assessment scores for 100E (both intervention and non-intervention sections) and other sections of MTH1825, a pre- and post- attitudes and beliefs survey for the MTH100E students to share their attitudes toward mathematics and learning, interviews with both the MTH100E and TE407 students, and video footage of the class sessions taught by the TE407 students.

MY FRESHMAN YEAR AS AN INTERNATIONAL STUDENT
Lina Wang
Category: Education, Section 3
Poster: 172
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Peter De Costa (Linguistics and Language)

Since the population of Chinese international students at MSU has increase lately, helping international students reduce culture shock experiences in both their academic and social lives has become a major concern on campus. As an Chinese International student myself, I started to doing my research by interviewing two undergraduate Chinese students from the English as Second Language center where the most Chinese students spend for their first year of college. My two participants are very different types of international students and they have very diverse views and attitude about their International student identity. Their perceptions represent the typical type of Chinese International Students at MSU. One of students is very initiative and uses a very positive attitude to overcome the difficulties he has met in his first year of college life. The other student is more passive, uses a relatively more negative perceptions to view the culture shock he has experienced in both his academic and social life. It is very surprising when you looking at them from an outsider's perspective to find out how different they are and how relative they are in a same identity. I also combined my research with the WeChat composition. WeChat is a popular Chinese social network for Chinese international students. Some interviews were also conducted by two Ph.D. students from the Second Language Studies program. After two semesters of collecting data and sharing the data with a professor, we have a better view to help the university to design programs which would help reduce culture shock experienced by students and ensure that they become more self-sufficient and better socialized into the MSU culture and the East Lansing community.

DEVELOPMENT OF A NEW RUBRIC TO ASSESS UNDERGRADUATE SCIENCE COURSE SYLLABI
Claire Morrison
Category: Education, Section 3
Poster: 173
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Sarah Jardeleza (Center for Integrative Studies in General Science), Rebecca Matz (CREATE for STEM)

Education research increasingly supports the benefits of a learner-centered approach to teaching. New instructional techniques focus more on developing skills and understanding concepts than on memorizing facts. It can be difficult to accurately assess the degree to which a course or instructor is learning-centered, but analysis of course syllabi—alone or in addition to other

measures—has the potential to give a fairly comprehensive view of a course layout and an instructor's teaching philosophy. We can then use this information to gauge changes in course syllabi over time, taking into account initiatives to improve undergraduate courses. In order to measure change, we have developed a rubric based on previous research, university requirements for syllabi, and sample syllabi from various biology courses. Our research then intends to explore links between aspects of a course syllabus and indicators of effective instruction in order to provide a more comprehensive view of course quality.

BUG'S THE WORD: DEVELOPMENT OF TWO NEW LABORATORY ACTIVITIES FOR AN INTRODUCTORY ENVIRONMENTAL SCIENCE AND ENTOMOLOGY COURSE
Jessica Kansman
Category: Education, Section 3
Poster: 174
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Amanda Lorenz (Entomology), Gabe Ording (Center for Integrative Studies in General Science)

The purpose of this project was to create two new lessons to enrich an introductory biology course for non-science majors. Insects, Globalization, and Sustainability Laboratory is a 2-credit course designed to introduce students to biological science in the context of Entomology. These activities were developed in alignment with the Undergraduate Learning Goals defined by Michigan State University, using the process of backward design, which emphasizes the importance of focusing on the goals and assessment of an exercise before constructing the lesson itself. The first new lesson is intended to develop and strengthen student's ability to apply extrapolative techniques. In this lesson, students identified and utilized applicable quantitative methods to solve problems relating to the strength of insects relative to their body size. They were then able to apply these methods to a variety of questions containing interchanging variables, and made judgments on appropriate comparisons to human strength. We assessed the student's understanding of the material though thought provoking quiz questions, and compared the results to our original intended learning goals. In the second new lesson, students will become familiar with how insects influence agriculture, and the process in which a biological control agent is selected through sample bioassays. Students will perform activities to reinforce the ideas of natural selection and coevolution, strengthening their understanding of predator/prey relationships. The objective of these exercises is to reinforce concepts discussed in lecture in a memorable and enjoyable manner, while still promoting the undergraduate learning goals and scientific discovery.

THE ROLE OF TECHNOLOGY IN THE FLIPPED CLASSROOM
Cassandra LaMarche, Samuel Braxton, Alan Chen
Category: Education, Section 3
Poster: 175
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Lisa Linnenbrink-Garcia (Counseling, Educational Psychology and Special Education), Kristy Robinson (Counseling, Educational Psychology and Special Education), Cary Roseth (Counseling, Educational Psychology and Special Education)

The flipped classroom reverses the format of a traditional classroom by providing the lectures online beforehand and using a variety of active learning techniques during class (Bull, 2012). As the flipped classroom setting provides affordances of technology, students will be able to more easily watch lectures and move through them at an individualized pace (ibid). We hope that the increased use of technology such as the ability for students to easily access lectures and the use of collaborative technology such as clickers will improve student's autonomy and intrinsic motivation (Mead, 2010). Increased use of technology in a flipped classroom compared to a traditional classroom provides greater opportunities for student autonomy and cooperative learning both in and out of the classroom, which in turn would increase students' intrinsic motivation. To study this, we are conducting a large scale study over the course of the year in an anatomy and physiology lecture. Baseline data collection was performed during the fall semester and our treatment group data collection is ongoing. By creating a learning environment with more room for student choice and autonomy, we hypothesize that students will have increased self determination therefore facilitating intrinsic motivation and promoting mastery and achievement goals. Researching alternative teaching methods such as classroom flipping allows for improved teacher instruction and better student outcomes.

ASSESSING COMPUTATIONAL COMPETENCIES FOR ENGINEERING UNDERGRADUATE STUDENTS
Thomas Dionise
Category: Education, Section 3
Poster: 176
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Claudia Vergara (Engineering Research)

In the global economy of the 21st century, the preparation of a competitive U.S. workforce with knowledge and understanding of critical computing concepts, methodologies, and techniques is essential. To meet the needs of future development, engineering students must be able to perform and understand a variety of computational tasks as they make their transition

into the workforce. Assessment plays a crucial role in maintaining high level education curricula. Assessment tools and frameworks are important to determine what a student knows and can do in the context of the engineering practice. Despite the vast use of computation in engineering undergraduate studies there remains an absence of valid assessments to measure computational competencies for engineers. The Collaborative Process to Align Computing Education with Engineering Workforce Needs (CPACE) team works to develop this relationship by comparing the skills desired in a globally competitive workforce with those obtained through the engineering curricula. By collecting data from student interviews and surveys, the CPACE team was able to create rubrics that allowed for the identification of the computational thinking processes used by students to solve engineering problems. The focus of this presentation is to describe our progress towards characterizing and assessing computational expertise within undergraduate engineering. We will describe our methodological and analytical process used to develop and validate assessments and scoring rubrics that can be used to measure computational competencies for engineering.

ENGINEERING, COMPUTER SCIENCE, & MATHEMATICS

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

3D LEAF SURFACE ESTIMATION
Vincent Zickefoose
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 179
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Daniel Morris (Electrical and Computer Engineering)

The Plant Research Laboratory of Michigan State University seeks to include 3D plant modelling and plant height over time information to its collection of plant phenotyping tools. The goal of this effort is to better understand the photosynthetic process so that it can be controlled and optimized for energy purposes. In an effort to accurately estimate total photosynthesis, we must be able to determine both total leaf surface area and the surface area of occluded regions of the plant. We have determined that an application of 3D modelling using depth sensing technology, will assist us to this end. Information such as leaf height, angle, and surface area will be collected and then used to construct arbitrary 3D models of the plants. These models will describe all the leaves of the plant, thus solving the problem of occlusion, which occurs when leaves or leaf parts are obscured from a particular viewpoint. Additionally, simply adding height and 3D topographical information to existing phenotyping tools in growth chamber environments such as top-down fluorescence and reflectance cameras, may further efforts to understand and optimize photosynthesis activity. This system is being developed using Creative SENZ 3D depth sensing cameras in a C++ programming environment. The system will utilize the 3D vision software tools OpenCV and Intel Perceptual Computing SDK. Image data collected from the camera are processed using MATLAB.

THE ROLE OF INTERFACE SHAPE ON THE IMPACT CHARACTERISTICS AND CRANIAL FRACTURE PATTERNS USING THE IMMATURE PORCINE HEAD MODEL
Patrick Vaughan
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 180
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Roger Haut (Radiology Osteopathic Medicine)

The forensic literature describes cases of cranial fractures in infants and children falling from low heights onto edged and pointed surfaces. The current study documents the impact biomechanics and fracture characteristics of infant porcine skulls dropped onto flat, curved and focal surfaces. For example, the study showed that the energy needed to cause cranial fracture initiation was nearly 4 times higher against a flat versus an edged surface. While the characteristics of fracture, based primarily on the number of fractures, was not a function of impact surface shape, the fracture patterns were dependent on surface shape. While impacts against a flat surface produced linear fractures originating from the sutures, more focal impacts produced depression fractures at the point of impact. In conclusion, the study validated the limited forensic literature and showed that fracture patterns are dependent on impact surface shape and energy, with the finding that more focalized impacts produce fractures at lower energy states.

IMPROVED FRACTURE TOUGHNESS OF AMINE CURED EPOXY RESINS
Nicholas Chargo
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 181
Location: Ballroom

Time: 9:00 AM-11:00 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

The epoxy industry is a multibillion dollar ($20billion) industry and is expected to grow in the coming years. Epoxy resins are used widely; these materials have applications in paints and coatings, adhesives, industrial tooling and fiber reinforced composites for marine and aerospace applications. The main type of epoxy resin used is diglycidyl ether of bisphenol-A (DGEBA). When cured with an amine-based hardener, DGEBA will form a strong and stiff solid. However, this solid material is brittle and has a low resistance to crack propagation, i.e. cured epoxies have a low 'fracture toughness'. As such, this work will explore the incorporation of a block co-polymer rubber (carboxyl terminated butadiene acrylonitrile (CTBN)) into the resin to enhance the cured epoxy fracture toughness. Previous research has shown that, during cure, the CTBN will phase separate from the 3-dimensional, cross-linked epoxy network and form spherical rubber adducts. During a fracture event, the rubber will absorb energy and allow the matrix to deform in a more ductile fashion. Therefore, this work will analyze fracture surfaces of "baseline", or neat samples and samples with a concentration of 10 phr CTBN. The size, shape and morphology of the spheres/ cavities after fracture will be examined under scanning electron microscopy.

DEVELOPMENT OF POLYELECTROLYTE MULTILAYER MEMBRANES TO IMPROVE COD REMOVAL OF ELECTROCOAGULATION TREATED HIGH-STRENGTH WASTEWATER
Brooke Meharg
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 182
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Ilsoon Lee (Chemical Engineering and Materials Science)

The purpose of this research is to purify electrocoagulation treated high-strength wastewater in order to meet drinking water standards. There are two types of commercial membranes available to purify solutions: nanofiltration and reverse osmosis (RO). Nanofilitration membranes are less effective with lower COD reduction properties while RO membranes have high COD reduction properties. Yet, RO membranes have low water permeability and this leads to high operating costs for the overall process. Polyelectrolyte multilayer membranes (PEM) were developed with the objective of creating a membrane with high permeability and high COD rejection properties to efficiently purify the high-strength wastewater. A PEM membrane is fabricated by the alternate layering of polycations and polyanions on an existing membrane surface, till the desired number of layers are deposited. The PEM membranes developed were created by the layer-by-layer assembly of polyelectrolytes on a commercial nanofilitration membrane. This helped to enhance the rejection property of the underlying membrane to near the level of an RO membrane while maintaining a higher permeability than RO membranes. So far, PEM membranes have been used to treat ionic solutions of known concentrations, targeting one specific ion. In this case, the membranes were used to treat a complex high-strength wastewater sample in which the content of the solution used is unknown. Hence, it extends the applicability of these modified membranes to real wastewater solutions.

MODELLING MULTIPHASE FLOW: SYNTHESIS AND DEFORMATION OF AN OIL-IN-WATER DROPLET
Peyton Longlet
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 183
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Maddalena Fanelli (Chemical Engineering and Materials Science)

Multiphase flow is important to understanding a broad range of industrial processes. Integration of modeling and experiments has become increasingly important to the advancement of the engineering discipline as a way of maximizing efficient use of time and resources. The production of microgels used in the food, pharmaceutical, and biomedical fields requires extensive knowledge of the flow behavior of oil and water emulsions. This study aims to simulate the synthesis and deformation of an oil-in-water droplet and compare results with experimental data. Once the simulation is validated, the modeling approach will be used to study microgel synthesis in the lab. In this presentation, we will show that the accuracy of simulation results depends heavily upon user-defined parameters, such as mesh and time-step size, and we will discuss the limitations of reproducing real life results with a computer simulation.

DETECTION OF MYCOBACTERIUM TUBERCULOSIS ANALOGUE BY NANOPARTICLES
Shaurya Srivastava
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 184
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Mycobacterium tuberculosis is a deadly disease that runs rampant through developing countries even till this day. M. tuberculosis is second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent. The majority of these deaths happen in developing areas, where accurate diagnostics and proper care is difficult to maintain. The current standard being used to detect tuberculosis in these resource limited areas is microscopy. In its current form, microscopy can produce variable results. Even the slightest deviations in sample preparations can lead to different conclusions regarding a patient's diagnosis. Our research focuses on developing a rapid, cost-effective, and efficient method to diagnose pulmonary tuberculosis in resource limited areas. We plan to use biosensors and nanoparticles with Deposition Pulse Voltammetry (DPV) to improve diagnostic efficiency and thus save lives. Currently we are working with an analogue of M. tuberculosis called Mycobacterium smegmatis. We theorized that our nanoparticles would be able to extract and detect M. smegmatis from in vitro samples and our preliminary data shows promise for this.

ENGINEERING NOVEL WAX ESTER SYNTHASES FOR BIODIESEL PRODUCTION
Sarah Thorwall
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 185
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Tim Whitehead (Chemical Engineering and Materials Science)

An alternate method to oil for creating fuel for diesel engines is through microbial conversion. One particular method is to catalyze the transfer of biomass-derived acyl-CoAs to alcohols in vivo to create fatty acid ethyl esters (FAEEs) for use as biodiesel. One enzyme that can perform this reaction within microorganisms is wax ester synthase (WS). However, a major problem is that WS cannot be expressed in vivo at high enough intracellular concentrations in its natural form to create biodiesel with the desired product titers. Creating more soluble wax synthases could improve microbial production of FAEEs and lead to higher biodiesel production. After modelling a putative enzyme structure from enzyme homologs, various point mutations aimed at preserving the enzyme's function while increasing its solubility were made. The purpose of my project is to test those protein designs to determine which mutations improve the solubility of WS. Mutagenized plasmids encoding the WS gene were introduced into bacteria and were used to express enzyme variants in vivo. I performed western blots on cell lysates to compare the relative amounts of mutagenized WS to that of the wild-type enzyme. I am extending this method to measure the solubility of a WS-meGFP construct by quantifying relative green fluorescence of soluble protein within cell lysates to reduce the number of western blot samples needed.

TIME TO STABILIZATION: INVESTIGATING POSTURAL STABILITY OF DIFFERENT FLOORING OPTIONS
Jessica Buschman
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 186
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Tamara Reid Bush (Mechanical Engineering)

Postural stability is important in the evaluation of human balance. It is common to have individuals stand on a foam pad in both research and clinical training purposes, however little research has been done to look at the influence on the foam cushioning in regards to balance. Further, the assessment of kinematics in conjunction with kinetics is not extensive in the study of balance. This study investigates the use of different floorings and its impact on stability, through kinematic measurement of time to rise. Qualysis motion capture software was used to in conjunction with force plate data to analyze the sit-to-stand motion of people of two age brackets: young adult and elderly. Twelve participants volunteered for this study; they were asked to perform the sit-to-stand motion for five different types of floorings. Participants began by sitting on a back-less stool and would move from this sitting posture to one of standing for each randomized flooring type. These results were compared by age and flooring type. It is hypothesized that no significant differences will be seen between flooring types, however age will yield comparable differences in kinematics of the sit to stand movement. The long term goal of this study is to compare and contrast the approaches for motion capture kinematic analysis and force plate measurement.

POSTER PRESENTATIONS, SECTION 2
BALLROOM, 9:00-11:00 AM

INFLUENCE OF GNP DISTRIBUTION ON THE CRYSTALLINITY OF HDPE IN GNP/HDPE COMPOSITE MATERIALS
Ana Veskovic
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 188
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Lawrence Drzal (Chemical Engineering and Materials Science), Azadeh Sheidaei (Mechanical Engineering)

High-density Polyethylene (HDPE) is a semi-crystalline thermoplastic polymer noted for its high strength-to-density ratio and wide variety of industrial applications, which range from chemical-resistant piping to consumer packaging. HDPE has a higher density, over 0.941 g/cm^3, and lower incidence of branching than does low density polyethylene (LDPE). This lesser degree of branching facilitates a tighter packing of HDPE chains, accounting for both HDPE's higher density and its greater degree of crystallinity versus LDPE. HDPE has recently found application as a matrix for graphene nanoplatelet (GnP)/polymer composite materials. The flat surfaces of graphene nanoplatelets provide a site for the initiation of polymer crystallization, leading to a greater degree of HDPE crystallization in their vicinity. Extruded and then injection molded 1% GnP in HDPE samples were compared to similarly prepared neat HDPE samples. Samples were studied via scanning electron microscopy (SEM) and other analytical techniques to determine HDPE crystallinity in the bulk polymer of both neat and composite samples as well as in the vicinity of GnP particles in the composite samples.

EXAMINING LONG-TERM STORAGE OF GOLD NANOPARTICLES
Linda Lay
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 189
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Evangelyn Alocilja (Biosystems Engineering)

Gold nanoparticles have important applications in the fields of detection and diagnostics. They can be used with biosensors to detect pathogens, diseases, contaminants, DNA, and bacteria faster and more cost effectively than conventional methods. Gold nanoparticles are unique in that particle size affects their optical and electrochemical properties which could influence diagnostic sensitivity. Because of their long-term usefulness, it is important to determine changes in size and efficacy over a long period of time. The purpose of this study was to determine the shelf life and stability of gold nanoparticles in solution over the course of a year. A Zetasizer was used to measure changes in size of the nanoparticles in storage and a spectrophotometer was used to measure changes in optical absorbance. It was found that the size of the gold nanoparticles gradually increased, possibly due to particle aggregation in the solution. The effect of size on detection sensitivity will need to be evaluated.

EFFECTS OF DRYERSHEETS ON MICROFIBER CLOTH
Bram Parkinson
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 190
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

I will present the effects of fabric softener and dryer sheets on microfiber cloth at the UURAF in spring 2015. A common warning for microfiber cloths, such as shirts or towels, is to not wash with fabric softener, or dryer sheets. The popular opinion as to why not, is that fabric softener/dryer sheets clog the holes within the micro-structure, and covers the material in a thin layer that prevents the breathability of the material. Using a scanning electron microscope, I will observe the material before and after drying with the fabric softener/dryer sheets to determine the extent of the damage done to the material. I will also perform research on: the effects of different brands of fabric softener/dryer sheets, the relationship between additional washings and damage, and the effects that fabric softener/dryer sheets have on different brands of microfibers.

HUMANITARIAN ENGINEERING
Adam Lyman
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 191
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Brian Thompson (Mechanical Engineering)

Worldwide, smallholding low-income farmers expend significant amounts of time, money and labor in the threshing of grain legumes. The current practice consists of manually beating raw product in sacks with wooden branches; producing approximately 28 lbs. /hr. Consequently, labor-intensive harvesting practices remain a barrier to increased legume production. Currently mechanized solutions designed for large-scale production are too mechanically complex, expensive, imported, and technical support is unavailable. A human-powered bicycle thresher has been designed and manufactured as a Clean Energy Solution aiming to significantly increase grain outputs at an optimized economic and technological threshold. After field testing with black bean in Guatemala, the machine has a 110 lb. /hr. throughput rating. This translates to an acre of harvested material per day, a plot size typically owned by a farmer. The local manufacturability of the thresher, high throughput capacity, and low-cost, facilitate a grass-root business model for farmers as well as fabricators. At an attractive price, ($200-$300) local entrepreneurs can purchase a locally manufactured machine and create a sustainable farmer-to-farmer threshing business. This

innovation provides a crucial service to growers, lowering harvesting costs, creating secondary incomes, and diffusing the benefits of mechanization with the aim of alleviating an identified legume production barrier.

IMPACT OF XYLAN O-ACETYLATION IN ARABIDOPSIS THALIANA ON CELL WALL POROSITY AND RESPONSE TO ALKALINE AND LIQUID HOT WATER PRETREATMENT
Henry Pan
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 192
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Jacob Crowe (Chemical Engineering and Materials Science), David Hodge (Chemical Engineering and Materials Science)

A key obstacle in the utilization of lignocellulosic biomass as a bioenergy feedstock lies in the recalcitrant secondary cell wall structure. Often a combination of mechanical and chemical pretreatment is required to modify the recalcitrant cell wall and render usable polysaccharides from these feedstocks. Another avenue of feedstock modification involves gene manipulation of plant cell wall proteins to produce feedstocks with reduced cell wall recalcitrance.
In this study, modified feedstock lines from Arabidopsis thaliana expressing reduced O-acetlyation (Tbl29-1 & Tbl29-2) were subjected to alkaline as well as liquid hot water (LHW) pretreatment, and fermentable sugar yields as well as structural characteristics were quantified and compared to wild type feedstock (WT). Pretreatment conditions resulted in increased deacetlyation and xylan removal from mutant feedstocks, indicating that O-acetylation gene suppression results in significant changes in hemicellulose susceptibility during pretreatment. Water retention and differential scanning calorimetry were utilized to observe increases in water swellability as well as increased mutant cell wall porosity post-pretreatment. Fermentable sugar yields indicate that in all pretreatment cases, mutant lines exhibited improved yields when compared to wild type. These findings suggest that acetylation of xylan during cell wall growth impacts xylan-cellulose interactions and accessibility within the cell wall matrix as well as impacts acetyl deficient feedstock susceptibility to cell wall disrupting pretreatments.

LEATHER PRODUCTION
Devin Lake
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 193
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

The production and preparation of leather products were examined using both Scanning Electron Microscope (SEM) and Electron Dispersion Spectroscopy (EDS) as processes to show both the chemical and physical changes that leather undergoes during production. Leather stained with alcohol based stains and water based stains were compared. EDS methods were used to test which applied coatings were more dominant throughout the process and whether or not the different stains gave off different chemical signatures. A sealant was added to the leather to make it waterproof and SEM images were used to compare the sealed leather to the previous stages of production to see the change in porosity. The above observations were also made to a stamped leather sample at every stage to see how it affects the application process.

FORMATION OF CALCIUM ALGINATE MICROBEAD VIA EXTERNAL GELATION
Matthew Schweiger
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 194
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Peter Lillehoj (Mechanical Engineering)

Microbeads have many useful applications in the pharmaceutical and biomaterials fields. Calcium alginate microbeads are especially useful as carriers of cells and drugs because of their hydrophilic membrane. Calcium alginate microbeads are generally created from a water-in-oil emulsion that occurs in microchannels. In this study, microbeads can be formed by creating droplets of an aqueous solution of sodium alginate in a continuous phase of soybean oil that contains a cross-linking agent. Cross-linking begins as soon as the droplets are formed and continues throughout the microchannel. This study attempts to optimize the production of mono-disperse calcium alginate microbeads by way of external gelation. The microfluidic device that allows this process to occur is fabricated using PDMS bonded to glass by way of oxygen plasma treatment. Many different parameters are explored including microfluidic configurations, concentrations of sodium alginate and surfactants, and continuous and dispersed phase flow rates. Some microfluidic configurations have been tested and new configurations have been designed using AutoCAD 2014. With the appropriate parameters, it is expected that a flow of microdroplets of varying sizes can be formed at a consistent rate and be used to create calcium alginate microbeads. The microbeads will be used to encapsulate proteins for transporting and delivery.

HEAT CONDITIONING OF FERMENTED CUCUMBERS
Jackie Thelen
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 195
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Steve Safferman (Biosystems and Agricultural Engineering)

Within the pickle fermentation industry, new calcium chloride brine is being considered to replace the current sodium chloride system. Using CaCl2 is potentially more cost effective and would prevent the hazardous buildup of NaCl in wastewater streams. However, in colder regions of the United States, long-term bulk storage of fermented pickles in outdoor tanks requires addition of NaCl to minimize freezing damage to the fruits. To completely offset the use of NaCl in all parts of the fermentation and storage process, a new method is required to preserve the quality and structural integrity of pickles exposed to subzero temperatures. Heat conditioning pretreatments have been researched extensively and have proven to be viable methods of maintaining the firmness and quality of cucumbers. This study sought to determine a promising heat conditioning method while exploring a post-treatment heating procedure that could reduce damage to the pickles. Fermented cucumbers were exposed to different time and temperature treatments, and then stored in sub-zero environmental conditions for one week. After storage, the cucumbers were placed in on-off heating cycles as post-conditioning, then visually and quantitatively analyzed for firmness and overall quality. Thermal properties of fermented cucumbers at different temperatures were also measured to aid in the analysis of these methods and the design of an effective process that will allow the storage of pickles in cold temperatures without loss of quality and without excessive use of NaCl.

POSTER PRESENTATIONS, SECTION 3
BALLROOM, 1:00-3:00 PM

ANALYSIS OF CARBON FIBER COMPOSITES WITH A SCANNING ELECTRON MICROSCOPE
Marco Lin
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 198
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

Carbon fiber dates back to the 1800s with Thomas Edison using it for the light bulb. Now, carbon fibers have been improved substantially and it is used in composite with other materials. The Manufacturing carbon fiber composites is extensive and requires many different steps; each variation in method may change the properties of the composite. Carbon fiber composites are manufactured by spinning carbon fibers through a chemical bath, layering it, pre-pregging it with resin, pressing it with an autoclave, and finally sizing it. Carbon fiber composites are used in aerospace, automotive, and civil engineering due to its high strength-to-weight ratio; however, carbon fiber composites may have defects such as voids, cracks, and inconsistency. These defects are small and difficult to examine under a light microscope; however, it may decrease the performance of the carbon fiber composites. In order to receive a better understanding of carbon fiber composites a set of well made composites was compared to a set of poorly made composites. The size and frequency of the voids, cracks, and inconsistency of the poorly made composite were examined with a scanning electron microscope (SEM) and were compared to a carbon fiber composite with few defects. Furthermore, the depth of the voids and cracks was quantified using a program in the SEM.

SEM RESEARCH
Laila Abdallah
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 199
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

Is there a difference under the Scanning Electron Microscope between generic ibuprofen and brand name product ibuprofen? There is an assumption within the community that the brand name products of Ibuprofen, i.e. Advil and Motrin, may work better than generic ibuprofen products. To challenge this, I asked the question, Is there a difference between generic and brand name ibuprofen products under the electron microscope? To answer this question, I will take molecular images of 4 total products - Advil, Motrin, and two generic Ibuprofens, (Meijer brand and a pharmacy brand). Using the scanning electron microscope, I will compare and contrast between the brands. In addition, while the active ingredient of each being ibuprofen, I will compare the inactive ingredients between all products. Further studies with this information can explain why or why not one brand name of ibuprofen might work better than the generic or vice versa. The results and conclusions are pending.

DETECTING PATHOGENS USING A DNA-BASED BIOSENSOR

Matthew Vasher
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 200
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Biosensors have a critical role in the diagnostics field. The development of a device for the rapid and economical detection of trace amounts of pathogens has important medical, agricultural, and forensic applications (Pal & Alocilja, 2010). In this experiment, methods of detecting key pathogen genes through the use of biosensors were investigated. Various human and plant diseases were detected through the use of nanoparticles. Specifically, DNA gene sequences from dengue virus and Pseudoperonospora cubensis bacteria were synthesized and then attached to gold nanoparticles and magnetic nanoparticles to form hybrids. The final hybrid consisted of a nanowire with a gold nanoparticle on one end and a magnetic nanoparticle on the other, with the target DNA holding them together. Magnetic separation was used to remove unattached gold nanoparticles and DNA so that only the fully formed hybrids remained. The sample was then added to a screen printed carbon electrode (SPCE) which was connected to a potentiostat. The potentiostat subjected the sample to cyclic voltammetry and differential pulse voltammetry in order to detect the presence of gold nanoparticles and display the sample's electrochemical properties. These properties revealed the pathogens' detectability and the sensitivity of the biosensors. This research will lead to more cost-effective and faster methods of detecting disease-causing agents and thus protect lives and food crops.

LEG SPLAY IN SEATED DRIVING POSITIONS
Lindsay Nault, Lindsay Hoard
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 201
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Tamara Bush (Mechanical Engineering)

This project involves determining the comfort of a seat in a car while driving by determining the pressure distribution of the contact area of the bottom of the seat and the maximum splay of the legs. The splay involves measuring the openness of the legs, the rotation of the knee, polar movement of the knee, and the knee angle. In addition to mapping the splay, the center of pressure and area of the contact in the seat is taken into account. The difference in pressure in splay is recorded with two different leg positions, one with feet and knees at shoulder width, and the other with legs at maximum splay. Each position is recorded on mid-sized males in three separate car seats, each with a different shape of bolsters on the side of the seat, ranging from flat to high bolsters. This study will be prevalent in determining the comfort of a seat in a car for future manufacturing.

SHAVING RAZORS COMPARED WITH A SCANNING ELECTRON MICROSCOPE
Reid Yonkers
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 202
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

I will be looking at different shaving razors and observing the differences between two variables: number of uses and price of the razor. I will looking to observe the differences between what could make a razor either $2 or $10 (if there are any differences). I will also see what the razors look like after one use to see if cheaper razors wear out more quickly than expensive ones. If I can collect the samples well enough, I would also be interested in comparing hair shaved with a cheap razor versus hair shaved with a more expensive razor to see if there are any differences in the quality of the cut. The sample preparation for the razors will not be very difficult, as they are metal and conductive for the SEM. The hair (if possible) would need to be observed under a low vacuum SEM with some form of conductive preparation done.

STRETCHABLE LUMINESCENT FILMS OF SILICON NANOCRYSTALS
Naomi Carlisle, Michael Bigllow
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 203
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Rebecca Anthony (Mechanical Engineering)

Nanocrystalline silicon is an efficient and tunable optical emitter and is attracting a great deal of interest for applications in the field of light emitting devices. Traditionally luminescent silicon nanocrystals have been used in rigid devices; therefore there is a need to explore the applications in flexible and stretchable devices. This study examines how the optical and structural

properties of non-thermal gas phase plasma-synthesized silicon nanocrystals (Si NCs) change when they are deposited on stretchable substrates made from polydimethylsiloxane (PDMS). Silicon nanocrystals were deposited directly out of the plasma onto PDMS substrates that were either relaxed or pre-stretched to several different percentages of their original length prior to deposition. The PDMS substrates coated with Si NCs along with rigid Silicon wafers coated with Si NCs were analyzed using SEM. It was found that the films deposited on PDMS differ in morphology compared to films deposited on silicon substrates. We also measured the photoluminescence (PL) properties of Si NCs deposited on pre-stretched PDMS substrates and found a shift in the normalized PL curve depending on their stretched state, demonstrating the viability of these luminescent Si NC layers for flexible electronics such as light-emitting device displays and sensors.

POSTER PRESENTATIONS, SECTION 4
BALLROOM, 1:00-3:00 PM

WATER ACTIVITY CHANGE IN ALMONDS AS A RESULT OF STRUCTURE CHANGE
Sarah Buchholz
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 206
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Bradley P Marks (Biosystems and Agricultural Engineering)

As more foodborne pathogen outbreaks occur in low-moisture foods, researchers are focusing more closely on matrices such as almonds, as well as nut products. Because product water activity (a_w) significantly affects Salmonella thermal resistance, it is important to control this variable so that experiments from different sources can be compared. To do so, test materials typically are equilibrated in humidity-controlled chambers. The objective of this study is to quantify the effect of product structure change on water activity of equilibrated whole almonds that are subsequently ground into almond meal and almond butter. Whole almonds were equilibrated in a sealed chamber for 4-10 days to three water activities (0.25, 0.45, and 0.65±0.02). To produce butter, 200 g of equilibrated almonds were ground in a food processor for 15 min, using dry ice to keep the temperature below 40°C. To produce meal, 100 g of equilibrated almonds were ground for 45 s. Water activity was measured in triplicate before and after grinding, and the relative humidity and temperature of the area where the grinding took place were measured. Paired t-tests were performed on the data to find that water activities significantly changed after the grinding of the almonds ($P < 0.05$). The a_w of butter was lower than that of the original almonds, but the meal ended with a higher a_w than the whole almonds. The environmental humidity also had an effect on the magnitude of a_w change.

DEVELOPMENT OF VALIDATION CHAIR FOR WEIGHT DISTRIBUTION MEASUREMENT
Rachel Geary
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 207
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Tamara Bush (Mechanical Engineering)

The objective of this research is to create a validation chair that can measure the weight distribution of the human body in a seated position. Determining weight distribution in a chair is useful for the design of automotive and office seating. The goals of the chair are to measure loading in the back and seat pans; this is done to represent loading of the thoracic, lumbar, and upper thigh regions. The chair is supposed to biomechanically articulate, with options to recline at the hips and rotate around the thoracic and sacral regions. The thoracic and sacral regions need to articulate based on the subject's seated position to get a better understanding of the forces on a human body when in a seated position. To create the chair, measurements of the legs, thighs, sacral, and lumbar regions of the spine were taken for the 50th percentile male. Based on the measurements, a model of the chair was mocked up in CAD form. The model served the purpose of showing how the chair would move, as well as finding the correct dimensions for the physical chair. The physical chair is currently in the process of being built. Once the chair is finished, it will be used to test human subjects. The long-term goal of this research project is to use the chair to validate shear and normal loads measured from piezoelectric film sensors.

MICROCONTROLLER WIRELESS IMAGE TRANSFER
Zachary Farmer
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 208
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Ning Xi (Electrical and Computer Engineering), Jianguo Zhao (Electrical and Computer Engineering)

How do robots and computers "see"? How are images and objects transmuted wirelessly through analog and digital means into usable data that a disk can store and a microprocessor can interpret? How can this process and the final product be made cheaper, smaller, faster, and easier to use? The purpose of this project in the MSU Robotics and Automation Laboratory is

focused on this question: to explore, research, and devise more effective wireless image transfer for a small, versatile, all-terrain robot, and to design a user interface for displaying these images and controlling the robot. Previously, these types of applications often required lengthy, from-the-ground-up design processes that resulted in a few expensive and often problematic custom microcontrollers. Since the advent of pre-constructed mass-produced programmable microcontrollers (Atmel, Arduino, and more recently the Raspberry Pi), "Applications Engineering" of inexpensive, versatile, mass-produced generic microcontrollers has become increasingly widespread. This project utilizes this type of microcontroller as the basis for its design, allowing two of these modules (one commander and one receiver, the receiver with a camera module added) to be programmed for image transfer, and making the process of design and final product cheaper, smaller, and faster.

MODELING THE PHOSPHORUS ADSORPTION CAPACITY OF IRON OXIDE MEDIA
Lauren Costantini, Jillian Johnson
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 209
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)

Phosphorus is a valuable resource in agriculture for plant growth, but can cause dangerous environmental impacts in high concentrations. It enters water supplies as effluent from wastewater treatment plants and fertilizer runoff. In high concentrations, it stimulates eutrophication, where an overgrowth of algae and a depletion of dissolved oxygen disrupt the ecosystem and cause a financial burden. In order to prevent detrimental levels of phosphorus from being expelled into the environment, MetaMateria Technologies (Columbus, OH) developed an iron oxide media that adsorbs phosphorus in wastewater. In order to optimize the effectiveness of the media, its adsorption capacity is needed to ensure sufficient phosphorus removal with minimal financial cost. This value can be calculated using the Langmuir isotherm model. In these experiments, varying masses of the media were suspended in wastewater, adsorbing phosphorus until its phosphorus levels stabilized at equilibrium. Modeling these equilibrium concentrations with the Langmuir isotherm model allowed for the adsorption capacity of the media to be effectively calculated. Former results were analyzed and used to adjust the isotherm experimental set up in order to ensure a better fit to the Langmuir model and a more reliable adsorption capacity. After verifying the applicability of the model, different types of wastewater were used in the isotherm to determine if variation in the water influent affected the adsorption capacity of the iron oxide media. These experiments provide a method to calculate the required amount of media in a system to efficiently reduce phosphorus levels and minimize its negative environmental impacts.

BIOBASED UNSATURATED POLYESTER RESIN FOR COATING APPLICATION
John Kaufmann
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 210
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Ramani Narayan (Chemical Engineering and Materials Science)

My research focuses on the polycondensation reaction between ethylene glycol and fumaric acid in the presence of catalyst to synthesize bio based polyethylene fumarate (PEF). This polymer PEF will then be used to prepare unsaturated polyester resins (UPR) to be used for protective coating applications after mixing it with proper diluent. This diluent also acts as a crosslinking agent. PEF was synthesized in two steps using the catalyst titanium tert-butoxide and hydroquinone to inhibit the reaction of double bonds within fumaric acid. It is important to protect the double bonds on fumaric acid so as to prepare a final unsaturated polyester resin. The first step involves an equilibrium condensation reaction between fumaric acid and ethylene glycol with a catalyst and inhibitor at 1500C-1600C with periodic removal of water using a vacuum. The removal of water is important in order to push equilibrium in the forward direction (Le Chatelier's principle). The progress of this step was determined using acid value titrations. The acid value dropped down through the course of reaction as fumaric acid was utilized in the reaction. The utilization of ethylene glycol was also confirmed by Thermogravimetric analysis (TGA). The second part of this reaction will involve the transesterification type mechanism which will eventually increase the molecular weight of the final polyester. This step of the reaction will be monitored through the use of Gell Permeation Chromatography (GPC).

AUTOMATIC LEMUR FACE RECOGNITION
Zach Richardson
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 211
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Anil Jain (Computer Science and Engineering)

Lemurs are the world's most endangered mammals. Analyzing individual lemur movements and interactions among a group of lemurs is essential for tracking the health of lemur population. Current methods of identifying lemurs are limited to capturing and tagging individuals or visually identifying them via appearance. Tagging individual lemurs is expensive and disruptive to the

population both in terms of causing injury and the possibility of group social dynamic shifts. Visual verification requires substantial expertise gained over time and produces results which are difficult to generalize. Automatic facial recognition of humans is a mature technology and has many uses, from unlocking smartphones to finding suspects in surveillance video. A novel application of this technology, however, is recognizing other mammalian species. By creating a facial detection and recognition application to identify lemurs from images, this project will allow for easy and inexpensive tracking of individual lemurs in their habitat. The presence of distinctive facial features among lemurs allows for accurate recognition by extending and adapting techniques used in human face recognition to lemurs' facial anatomy. Face detection is accomplished by training the Viola-Jones detector on a large number of lemur face images (positive examples) and non-lemur face images (negative examples). Detected face images are normalized (for size and rotation) based on eye locations. Face matching is accomplished via a discriminant analysis using SIFT and MLBP local facial features. The accuracy of this method is estimated by 5-fold cross-validation. An initial version of the lemur face recognition system achieves 85% rank-5 accuracy.

POSTER PRESENTATIONS, SECTION 5
BALLROOM, 1:00-3:00 PM

STRUCTURAL FACTORS OF LIGNOCELLULOSIC FEEDSTOCKS IMPACTING PROTEIN ADSORPTION
Nicholas Feringa
Category: Engineering, Computer Science, and Mathematics, Section 5
Poster: 215
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Jacob Crowe (Chemical Engineering), David Hodge (Chemical Engineering)

One promising alternative to traditional fossil fuels resides in the utilization of lignocellulosic feedstocks for the production of biobased fuels and chemicals. An obstacle to the commercialization of lignocellulosic feedstocks resides in the recalcitrant nature of plant cell walls, limiting polysaccharide accessibility to enzymatic depolymerization. In this study, the impact of feedstock structural characteristics on enzyme binding and hydrolysis effectiveness were examined. Samples with a variety of different structural characteristics were generated by subjecting corn stover to alkaline, alkaline oxidative and liquid hot water pretreatments. Overall polysaccharide and lignin content were determined and feedstock water retention and carboxyl were quantified as indirect metrics for measuring swellability and lignin depolymerization. Enzyme binding was examined to determine enzyme accessibility to modified feedstocks, with fermentable sugar yields being quantified to determine extent of enzymatic hydrolysis. In addition, environmental factors such as solution pH on enzyme binding were examined for select feedstocks at low and high enzyme loadings. Results from this study provided correlations relating specific structural modifications on enzyme accessibility within the plant cell wall.

AUTONOMOUS INDOOR FLYING ROBOT
Yirui Wu
Category: Engineering, Computer Science, and Mathematics, Section 5
Poster: 216
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Ning Xi (Electrical and Computer Engineering)

Development of an autonomous indoor flying system by integrating various sensors such as laser range finder, camera and inertial sensor. The project is implemented on a quadcopter system by creating the flying algorithm and conducting automated indoor flight experiment with computer vision. The applications for this flying robot could be specific surveillance and rescue missions.

THERMOELECTRIC POWER ENHANCEMENT OF Ge_4SbTe_5
Spencer Mather
Category: Engineering, Computer Science, and Mathematics, Section 5
Poster: 217
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Donald Morelli (Chemical Engineering and Materials Science)

The world's energy demands have continued to increase over the past century. The current methods of energy production use hydrocarbon fuels, which are non-renewable and could potentially negatively impact the earth's climate. Much research effort is being dedicated to finding and developing alternative or renewable sources of energy. Among the many new forms of energy harvesting technologies are thermoelectric materials. These materials possess the ability to convert wasted thermal energy into electrical energy through solid-state processes, and thus can potentially increase the efficiency of energy utilization. The efficiency of the thermoelectric process is constrained by the Carnot efficiency and ZT, the dimensionless figure-of-merit, which is dependent on the intrinsic electrical and thermal properties of the thermoelectric material at hand. Though thermoelectric materials have the potential to increase the efficiency of modern energy sources, the materials still have many obstacles to

overcome, including material and processing cost, thermoelectric efficiency, and toxicity of materials. The following work has developed a new synthesis method for the phase change material **Ge_4SbTe_5** which is less costly and requires less processing than previously reported. In addition to the new synthesis method, Sn was substituted on the Ge site, and it was shown that lattice thermal conductivity could be reduced, potentially resulting in an increase in thermoelectric conversion efficiency.

EMBEDDED WIRELESS SYSTEM FOR MINIATURE ROBOT
Hongyi Shen
Category: Engineering, Computer Science, and Mathematics, Section 5
Poster: 218
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Ning Xi (Electrical and Computer Engineering)

In this project, we aim to implement an embedded wireless vision system for miniature robots. Equipped with such a system, miniature robots with size of a few centimeters can send video wirelessly back to a computer. The system has two printed circuit boards, one connected to the computer and the other one attached to the robot. Each of the boards has a micro controller with Zigbee communication capability. The board on the robot can read image data from a miniature camera and send the image to the board connected to the computer. The computer, once received the image, can display the image on the computer screen. Miniature robots with such a system have a wide range of applications such as search and rescue, environmental monitoring, and biological motion analysis.

ANAYSIS OF GHG EMISSIONS REDUCTION ASSOCIATED WITH BIOMASS COMBUSTION AND PRETREANTMENT PROCESSES.
Jack Stephan
Category: Engineering, Computer Science, and Mathematics, Section 5
Poster: 219
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)

Global climate change is already beginning to affect society negatively. It is very clear that greenhouse gas (GHG) emissions are to blame for the shifting climatic patterns. Several studies have shown that efficiency improvements alone are not likely to sufficiently reduce GHG generation, thus new models of energy generation will be necessary to mitigate climate change. Biomass materials like switch grass, hybrid poplar, and waste woods can be used to mitigate current greenhouse emissions and other pollutants if co-fired in current Michigan coal-fired power plants. The decrease in emissions will correlate with distance to power plant from feedstocks source and pretreatment used. The research was completed through an extensive literature review comparing existing systems and solutions implemented globally and gathering tacit information from thermal conversion experts the MSU colleges of Engineering and Agriculture and Natural resources. This information is condensed into a model to depict biomass sources, distances from generation facilities and reduction of GHG emissions. The methods to and assumptions utilized to create this model will be demonstrated along with potential energy sources that could be tapped for GHG reductions.

RARE-EARTH METAL OXIDES WITH NANOFIBROUS MORPHOLOGY FOR DESULFIDATION PURPOSES PREPARED VIA ELECTROSPINNING
Zachary Baumer, Nick Santi
Category: Engineering, Computer Science, and Mathematics, Section 5
Poster: 220
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Junghoon Yeom (Mechanical Engineering)

We are trying to explore the effect of nanosizing sorbents for purposes of desulfidation at high temperatures. Nanofibers have a self supporting structural morphology in addition to increasing surface area available for reaction. Also, nanosizing possibly exposes more crystal boundaries that improve reaction kinetics at the surface of a sorbent and contaminated gas stream. Rare-earth metal oxides (REO) also show favorable reaction kinetics and stability at higher temperatures than conventional metal oxide sorbents such as zinc-oxide.

ENVIRONMENTAL SCIENCE & NATURAL RESOURCES

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

SENSITIVITY OF THE FRANZ JOSEF GLACIER (NEW ZEALAND) TO CLIMATE CHANGE
Caitlin O'Neill

Category: Environmental Science and Natural Resources, Section 1
Poster: 222
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Michael Gottfried (Geological Sciences), Jeanette McGuire (Zoology)

Nestled in the Southern Alps of New Zealand, the Franz Josef Glacier, known as Kā Roimata o Hine Hukatere to the Māori people, has been thinning at a rate of approximately 1.4 meters per year since 1970. The glacier has shown and extremely fast response time to environmental changes in comparison with other glaciers and has retreated ca. 500 meters since 2008. Numerical ice-flow and mass balance models, ice mass flux, and general studies of changes in precipitation, atmospheric circulation, and temperature are utilized in combination to study the sensitivity of the Franz Josef Glacier. The study was conducted using a bibliography compiled from research journals and other articles focused on glacial change, both in New Zealand and throughout the world. The purpose of the study is to answer the large-scale questions of whether or not the Franz Josef Glacier is heading towards an ultimate fate of disappearing completely, and more broadly, what implications and lessons this has for interpreting future global change.

BELLE ISLE ENERGY CONSERVATION AUDIT
Melanie Goerke, Thomas Hanna
Category: Environmental Science and Natural Resources, Section 1
Poster: 223
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Tim Mrozowski (Planning, Design and Construction)

During the Spring semester of 2015, my research team and I along with Professor Tim Mrozowski conducted an energy assessment on an existing building on Belle Isle, Michigan. During the assessment, as a group we collect field data consisting of current building data where they could use upgrades in terms of the structure, as well as what they could do to make the building more energy efficient. At the end of the research span, we present our information to the Michigan DNR so they can make upgrades to the building according to the energy assessment we've done, as they reevaluate the use of their building.

EFFICACY OF ESSENTIAL OIL COATING APPLICATION ON 1% CHITOSAN BIOPLASTIC FILM IN INHIBITING MICROBIAL GROWTH
Rachel Smith, Einat Kebede
Category: Environmental Science and Natural Resources, Section 1
Poster: 224
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Pascal Kamdem (Packaging)

Synthetic plastic materials are known for their low to negligible natural biodegradability, compostability and carbon foot print from extraction, manufacture and transportation in their life cycle assessment. Costs associated to their disposal after services are important because of their low recyclability rates and technologically challenging measures to reuse mix plastics. One of the most obvious strategies is to use renewable, biodegradable and carbon storage materials such as cellulose, hemicellulose, lignin, oils and chitosan as raw materials for flexible films for food packaging. However, one of the multiple challenges on the use of biodegradable materials is their hygroscopicity which may promote the growth of microbes and bacteria. This study proposes to use chitosan obtained from seafood shells in combination with oils such as Eucalyptus oil and Aloe Vera to control the growth of bacteria on the resulting films. Only natural and organic materials such as Chitosan, vinegar, Eucalyptus oils and Aloe Vera extract will be used in the formulation. The tensile strength and elongation/stretchability will be evaluated by testing the films with Instron equipment in the school of Packaging. The antimicrobial properties will be evaluated by using E. Coli and Salmonella. The effect of the addition and the levels of Eucalyptus oils and Aloe Vera extract will be correlated with the tensile strength and the antimicrobial properties.

REPRODUCTIVE SUCCESS IN MALE LAKE STURGEON AS A FUNCTION OF MEASURES OF SPERM QUALITY
Zach Roush
Category: Environmental Science and Natural Resources, Section 1
Poster: 225
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

Lake sturgeon (Acipenser fulvescens) is a species of regional conservation concern because of low natural reproduction, which impedes population recovery. Among many factors that may affect reproduction in lake sturgeon, one of particular interest is male sperm quality. This species reproduces by broadcast spawning, where gametes are released into the waters at the spawning area. We hypothesized that sperm quality would affect male reproductive success. To investigate, we genotyped all

spawning adults and 360 juveniles to determine parentage and then estimated the number of juveniles produced by each adult. We collected sperm quality data (sperm count and motility) from 165 males. We then used regression analysis to quantify association between male reproductive success data and sperm quality. Based on our hypothesis we expected that males with higher quality sperm would have larger body size and would have higher reproductive success. Our data shows that understanding factors associated with reproductive success in lake sturgeon can be used to manage for population recovery and to estimate potential rates of loss of genetic diversity.

EVIDENCE FOR SEXUAL VIABILITY OF INTENTIONALLY HYBRIDIZED BROOK TROUT (BT) * LAKE TROUT (LT) FISH IN A MICHIGAN STREAM AND IMPLICATIONS FOR MANAGEMENT
Mackenzie Feringa
Category: Environmental Science and Natural Resources, Section 1
Poster: 226
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

The Michigan Department of Natural Resources (MDNR) has developed a hybrid fish (splake) by crossing female lake trout (Salvelinus fontinalis) with male brook trout (Salvelinus namaycush). These fish are stocked in near-shore waters of the great lakes for sport fishing. Brook trout and lake trout would not normally inter-breed because they use different areas in the Great Lakes (LT) or streams (BT) for spawning. People widely believe that splake are sterile and could not backcross with either parental species. However citizens and researchers have raised concerns based on observations of fish of intermediate phenotype. The overall goal of this project is to examine the hypothesis that splake are present in brook trout spawning habitats and backcrossing into parental lines that could create a hybrid swarm. Methods included genotyping putative splake, collected from BT spawning rivers and known splake, and known resident river populations of BT and individuals from MDNR LT and BT hatchery strains at 15 microsatellite loci. Polymerase Chain Reaction will be performed on each sample under conditions specific for each locus. Genotypes of putative splake and stream BT will be compared to the known splake and hatchery and wild parental BT and LT samples. Identification of known fish of intermediate phenotype to FI hybrids or either parental species will be based on Bayesian-based assignment tests and species-specific genotypic differences. Genetic verification of morphological identification of hybrids from BT spawning areas would inform managers of risks associated with future introgression into fisheries.

MEASURING CONNECTION TO THE ENVIRONMENT THROUGH DRAWING ANALYSIS
Kyler Stanley
Category: Environmental Science and Natural Resources, Section 1
Poster: 227
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Osvaldo Hernandez (Center For Integrative Studies in General Science), Julie Libarkin (Geological Sciences)

A person's feelings of environmental connection can impact how they interact with the planet, how they modify their personal behaviors, and how they value the world around them. Environmental connection has previously been measured through Likert-type scales, through Venn diagrams, and through drawings. In this study, surveys related to environmental connection and drawings of MSU's campus were collected from over 500 college-level, non-science majors enrolled in a physical science lab. Drawings were analyzed through identification of features related to: buildings, monuments, natural spaces, transportation, and other characteristics. Factor analysis of drawing features indicates that three models underlie student drawings: Building-focused model, Sports-focused model, and an Other features model. Drawing analysis was compared with three well-known Likert-type environmental connection scales. In this presentation, I will present this comparison between drawing analysis and existing scales in order to show that drawings can be a valid alternative to written surveys. Ultimately, drawings can be used as a tool to understand how individuals interact with the environment, which is useful for natural service providers, such as nature centers, who may be interested in surveying quickly or collecting surveys from pre-verbal groups such as children.

NITROGEN AND PHOSOPHORUS LOADING IN THE GREAT LAKES BASIN
Henry Whitenack
Category: Environmental Science and Natural Resources, Section 1
Poster: 228
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Anthony Kendall (Geological Sciences)

Nutrient loading has been linked to many issues including harmful algal blooms, contamination of drinking water and decreased biodiversity in aquatic species. In the Great Lakes algal blooms continue to plague Lake Erie rendering Toledo area tap water undrinkable as recent as summer 2014. GIS models were previously created to predict nitrogen (N) and phosphorous (P) nutrient loading in the Lower Peninsula of Michigan. These N and P models have since been expanded to a boundary encompassing parts of 9 states. Nutrients show variations in distribution for all parameters tested. Environmental managers

could potentially use this work when making land use decisions regarding how and where to focus efforts to reduce nutrient loads onto the landscape.

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

AQUAPONICS AT CAPE ELEUTHERA INSTITUTE: A MODEL FOR SUSTAINABLE FOOD SYSTEMS IN THE BAHAMAS
Luke Sasek
Category: Environmental Science and Natural Resources, Section 2
Poster: 231
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Michael Kaplowitz (Community Sustainability)

This study focused on the aquaponics system at Cape Eleuthera Institute on Eleuthera Island in The Bahamas. Aquaponics is the combination of fish farming (aquaculture) and growing plants without soil (hydroponics) in a recirculating system. Citizens of South Eleuthera primarily depend upon marine-based resources for subsistence, and increased pressure on fisheries has resulted in threats to local subsistence strategies. The aquaponics project at Cape Eleuthera Institute was introduced in 2005 as a model for a sustainable food production system. Advantages to aquaponics systems in coastal environments such as The Bahamas include the tropical climate and potential to relieve pressure off of local fisheries if adopted on a large scale. Aquaponics is also energy efficient, limits waste discharge into the environment, reuses water through biofiltration, and provides organic (rather than synthetic) fertilizer to plants. One of the inputs into an aquaponics system is the material in which plants take root. Rockwool is an inorganic material that is commonly used, but is energy-intensive to produce, inefficient to transport, and does not biodegrade, causing disposal problems. The aim of this project was to determine whether coconut coir, a natural fiber extracted from the husk of a coconut, could achieve comparable growth rates to rockwool. Germination rates, true leaf count, and plant height between the two growth mediums produced data that showed statistically insignificant differences upon analysis, suggesting that coconut coir may be a viable solution.

THE EFFECTS OF ROAD SALT ON PLANT GROWTH AND SURVIVAL: A COMPARISON OF NATIVE NON-SALT TOLERANT AND NON-NATIVE SALT TOLERANT GRASSES
Chelsea Mongeaulan Zaback
Category: Environmental Science and Natural Resources, Section 2
Poster: 232
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Matthew Rowe (Zoology), Elizabeth Stelzner (Plant Biology)

Road salt added onto streets and sidewalks can run off into soil and adversely affect plant growth. We studied what affects road salt has on a salt-tolerant species of grass invasive to Michigan (Phalaris arundinacea) and a Michigan native non-salt tolerant species of grass (Panicum virgatum). We hypothesized there would be a significant difference between growth rates when both species were exposed to saline growing conditions. We predicted that P. arundinacea would have more growth than P. virgatum, because an invasive species would likely be tolerant to harsh environmental conditions. In our greenhouse study, we created three watering treatments that were applied to several plants of each species: 5.5 g/liter, 0.5 g/liter, and 0 g/liter (control) salt water solutions. We recorded the length of the longest blade and blade count at the beginning and end of the study. We found a significant difference in growth rates between P. arundinacea and P. virgatum ($p=0.026$). P. arundinacea had an overall higher growth rate than P. virgatum, but the growth rate did not change with an increased salt concentration. We concluded that P. arundinacea would be more able to grow better in soils with salt concentrations.

A COMPARISON OF THE DISTRIBUTION OF LARVAL AND NYMPHAL IXODES SCAPULARIS AMONG DIFFERENT HOST SPECIES IN REGIONS THAT VARY IN LYME DISEASE ENDEMICITY
Samantha Zohr
Category: Environmental Science and Natural Resources, Section 2
Poster: 233
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Jean Tsao (Fisheries and Wildlife)

Borrelia burgdorferi is a spirochetal bacterium transmitted by Ixodes scapularis, the blacklegged tick. Lyme disease is caused by this bacterium. Lyme disease incidence differs across the eastern United States. Understanding the differences in the distribution of juvenile ticks among different host species that vary in reservoir competence across the eastern United States can lead to an understanding of the variation of Lyme disease incidences. I. scapularis is considered a generalist parasite. We hypothesized that certain host species feed more juvenile ticks than others; furthermore, we hypothesized that biological and ecological differences among hosts will result in non-random distributions of juvenile ticks among host species in each region. We used infestation data from small and medium mammals and lizards collected using standardized methods at multiple sites

in the eastern United States. Using Cape cod data we compared the proportion of larval and nymphal ticks parasitizing each host species as well as the relative abundance of each host species. We predicted that juvenile I. scapularis will be non-randomly distributed among host species and that there would be a correlation between the host use and Lyme disease incidence due to the reservoir competence of the preferred hosts. We found that Peromyscus leucopus was the species found in highest abundance at the Cape Cod site, and that Peromyscus leucopus was most commonly infested with juvenile I. scapularis. Thus, juvenile I. scapularis may not show a preference for certain hosts; they may come in contact with Peromyscus leucopus more than other host species.

HABITABILITY OF MARS: EVIDENCE FROM THE PHOENIX MARS LANDER LANDING SITE, REVISITED
Ethan Lee, Asia Grant, Anya Niehaus
Category: Environmental Science and Natural Resources, Section 2
Poster: 235
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Michael Velbel (Geological Sciences)

Water is an indicator of habitability in the search for past or present life on Mars. In order to determine the potential presence of water on Mars, the Mars analog HWMK600 from the flanks of Mauna Kea volcano on Hawai'i was examined microscopically. A secondary purpose of this investigation was to determine whether features indicating the presence of water could even have been discerned using the Optical Microscope (OM) on the Phoenix Mars Lander due to its magnification. Grains from the analog material were imaged under a scanning electron microscope (SEM) at two different magnifications and resolutions and examined for features that could have been caused by aqueous processes. Adhering particles and rounded edges observed on most of the grains indicated chemical and mechanical periglacial aqueous activity, which is consistent with what is known about the surface conditions on Mars, and indicated a lack of liquid water. SEM analysis also determined that most of these features could not have been imaged at the magnifications and resolutions of the instruments on the previous missions to Mars. Additionally, grain shape (elongation) was measured using the width and the length of each grain from both the better resolution close-up images and the context images that had the same resolution as the Phoenix OM (4 μm/pixel). Different operators could better replicate the measurements using the close-up images, revealing the limitations of previous attempts to measure grain size and shape parameters from Phoenix data.

CONSUMERISM AND THE EARTH: ARE WE PROGRESSING TO A GLOBAL ENVIRONMENTAL ARMAGEDDON?
Angela Porta
Category: Environmental Science and Natural Resources, Section 2
Poster: 236
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Joseph Martin (History, Philosophy, and Sociology of Science)

Our society's idea of progress equates to unlimited economic growth, ever-increasing mass production, and an insatiable conversion and consumption of nature's resources. This biased vision of progress in today's world is completely in alignment with an anthropocentric mindset. This vision and mindset has blinded most of humanity to the adverse consequences in nature that are reaped by the progress we show. Unrestrained consumption combined with the lack of recognition and unresponsiveness to these environmental consequences can likely lead to the demise of humans. Society's mass use of and reliance on industrial technology has created a two-part problem. The first part is extensive application of technology and the continued over-conversion of natural resources into commodities that has created a large disconnect between humans and the natural world. Secondly, overconsumption has resulted in devastating effects on the environment. These two issues coupled together create a situation where the majority of society fails to understand the relationship between its consumerism and effects on nature, which bears consequential harm to humans. The question remains whether or not people will accept that what we are progressing towards today not only can change, but must change. A survey will be distributed to people in the area of Michigan State University to assess the degrees of overconsumption of natural resources and unawareness of environmental issues. The study aims to evaluate if people that are most reliant on consumerism will be less likely to understand environmental issues and promoting environmental action.

POSTER PRESENTATIONS, SECTION 3
BALLROOM, 1:00-3:00 PM

USING COMMUNITY WEIGHTED MEANS TO UNDERSTAND COMPOSITIONAL CHANGES OVER TIME IN RESTORED SOUTHWEST MICHIGAN PRAIRIES
Madeleine Cleary
Category: Environmental Science and Natural Resources, Section 3
Poster: 239
Location: Ballroom
Time: 1:00 PM-3:00 PM

Mentor(s): Chad Zirbel (Plant Biology)

Restoration is done in hopes of reclaiming the beneficial services of previously degraded ecosystems. In restored prairies, these services include biodiversity, biofuel production, pollinator habitat, aesthetic value, and many others. A predictable restored community is essential if these services are to be achieved. However, the success of restorations can be thwarted by many factors such as invasions, disturbances, and land use history. Understanding community dynamics through the lens of functional traits is one step toward mitigating such influences. We collected vegetative height, biomass, specific leaf area (SLA), and seed release height on plants from 29 restored prairies throughout southwestern Michigan. We then assessed changes in community weighted mean (CWM) trait values as site age increased within the restored prairie sites and the Great Lakes Bioenergy Research Center (GLBRC) prairie plots. Within the GLBRC, height and biomass increased with site age while SLA decreased. All changes in CWMs with age within the restored prairies were non-significant. This is likely because CWMs at these sites are influenced by differing soil conditions, varied land use history, and different seed sowing between sites beyond just site age. In contrast, the GLBRC was sown with the same seed mix and has the same land-use history making changes in CWMs with age much less noisy. Through assessing how community weighted means change with prairie age we hope to better understand the link between community assembly, functional traits, and ecosystem function.

CARBON AND NUTRIENT DYNAMICS BETWEEN TREES IN AGROFORESTRY INTERCROPPING SYSTEMS: A CASE STUDY OF HYBRID POPLAR BIOMASS CROP, SWEET PEA, AND VETCH
Patrick Shults
Category: Environmental Science and Natural Resources, Section 3
Poster: 240
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Pascal Nzokou (Forestry)

Biomass is one of several keys to achieving sustainable green energy in the near future. To do this, short rotation biomass cropping systems need to be designed for low-input and high-yields. This project combines agroforestry methods like intercropping to integrate nitrogen fixing legumes and hybrid poplar trees to create sustainable biomass in the short term with little or no inputs. If successful, these systems would provide a more carbon neutral form of biomass energy while simultaneously maintaining the option of being food productive. The first year of the experiment has been spent collecting baseline data to which next years data will be compared after successfully intercropping legumes in several of the research plots.

GENETIC ASSESSMENT OF THE MALE REPRODUCTIVE SUCCESS OF LAKE STURGEON (ACIPENSER FULVESCENS) AS A FUNCTION OF DURATION OF RIVER OCCUPANCY DURING THE SPAWNING SEASON
Danielle Blumstein
Category: Environmental Science and Natural Resources, Section 3
Poster: 241
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

In lake sturgeon (Acipenser fulvescens), individuals migrate upstream to spawning grounds in response to several environmental cues including temperature and discharge. Spawning time, location, and amount of time spent in the spawning location can all have strong impacts on the number of mates and reproductive succession (RS). We hypothesized that different behaviors with respect to patterns of movement in the stream would affect male RS. Specifically, we predicted that individuals that remained in the stream for longer periods of time would mate with more females and have higher RS. To analyze movement within the Upper Black River (Michigan, USA) during the 2013 spawning season, passive inducible transponder (PIT) tag arrays were placed at two stream locations, at the mouth and immediately below the locations used for spawning. Nearly all adults had spawned in previous years and were previously marked with PIT tags. We captured larval fish during annual drift net surveys and used adult and larval multi-locus microsatellite genotypes to determine parentage and to estimate male mate number and RS. We used regression analysis to quantify associations between male mate number and RS and during of time (days) in the river. Results will be discussed in terms of the importance of inter-individual behavioral differences (retention time) to individual contributions to population levels of recruitment and to the risk for loss of genetic variation.

DETERMINING LEVEL OF BACTERIOPHAGE FALLOUT IN SUBSEQUENT STAGES OF THE BELDING WASTEWATER TREATMENT LAGOON
Tim Stieve
Category: Environmental Science and Natural Resources, Section 3
Poster: 242
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Joan Rose (Fisheries and Wildlife)

Bacteriophage, present in fecal matter, were the focus of the study. In preliminary studies, subsequent stages in lagoon wastewater treatment showed decreasing levels of bacteriophage. Processes that could cause the decrease in bacteriophage include: settling, light inactivation, and/or physiochemical inactivation (Temperature, pH, acidity/alkalinity, salinity). This study looked at natural forms of bacteriophage removal; settling and light inactivation. Filtration was used to investigate which particle size bacteriophage associate with most during settling. Various combinations of light and settling were used to determine the largest factor in bacteriophage reduction/inactivation. To do this, the influent to pond one (site A) and effluent of the first pond (site B) were sampled three times, then composited for five treatments. Settling with/without light, no settling with/without light, and one set of samples was incubated to determine if heat was a factor in bacteriophage fallout. Timepoints of zero, four hours, 24 hours, and 48 hours were run for each treatment. The male-specific coliphage assay (EPA method 1602) was used to quantify bacteriophage concentrations at each timepoint. Data was analyzed for statistical significance using one samples t-test, Kruskal-Wallis one-way ANOVA on ranks, and Mann-Whitney Rank Sum Test. Results showed significant differences within all timepoints regardless of treatment for both sites, and between timepoints regardless of treatment for site A, but not site B. For site A the cause of the difference could not be determined. Differences between individual treatments over time were looked at; no significance was found between treatments over time for either site.

MONITORING LONG-TERM EFFECTS OF LAMPRICIDE APPLICATION ON THE METAMORPHOSIS OF SEA LAMPREY IN THE GREAT LAKES BASIN
Clara Lepard
Category: Environmental Science and Natural Resources, Section 3
Poster: 243
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Yu-Wen Chung-Davidson (Fisheries and Wildlife), Weiming Li (Fisheries and Wildlife)

The sea lamprey Petromyzon marinus is a parasitic invasive species which has had severe impacts on the Great Lakes fisheries since their initial invasion. Lamprey undergo metamorphosis, which develops through a series of identifiable morphological stages. While larvae before metamorphosis act as filter feeders in freshwater streams, a metamorphosed juvenile will enter the Great Lakes to feed off of live fish. Lampricides are applied in these freshwater streams to destroy larval sea lamprey before they have the chance to metamorphose into a parasitic juvenile and enter the great lakes. As lampricide treatments have been in effect for over 60 years, speculations have been made as to how larval lamprey may be adapting to survive these repetitive treatments. Metamorphosis at an earlier age may lead to increased survivorship in individuals who leave tributaries before lampricide application. One would expect these metamorphosing lamprey to be smaller in size than those before lampricide application, as metamorphosis has accelerated compared to growth. Larval specimens collected from 1920 to 2011 in Canada and the Great Lakes Region were measured by body length and identified by metamorphic stage. Focusing on data collected along the edges of Lake Ontario, initial analysis of these data has revealed signs of a clear decrease in average body length across metamorphic stages over time. If further processing confirms these trends, these data could be a record of evolution in action over the past century. Monitoring adaptations in Sea lamprey is essential to continue their effective control.

TREE CROWN ASSESSMENT IN MADAGASCAR
Clayton Batko
Category: Environmental Science and Natural Resources, Section 3
Poster: 244
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Bill McConnell (Fisheries and Wildlife), Andres Vina (Fisheries and Wildlife)

Since the 1950s, much of Madagascar's natural, old-growth forests have been lost to deforestation. The degree to which Madagascar has been deforested has been largely misrepresented claiming that 90% of the forests have been lost, a claim that is lacking in evidence due to the forest canopy, rather than tree crown percentage. Even though this percentage is incorrect, Madagascar's forests are still at risk. Using GIS software, hundreds of polygons are randomly placed over the landscape with ten push-pins randomly placed within each polygon. Each polygon is then observed at the individual level, using a range of historic imagery to interpret the most recent landscape image, and the amount of push-pins that fall on each tree crown are then recorded. Additionally, the land-cover type that occupies >50% of the polygon is recorded to understand the context of the tree cover. This method will give a more accurate percentage of tree count, which will increase our understanding of the situation. Using high resolution sources (Google Earth) on such a detailed level will help to "train" an automated classification of moderate resolution (Landsat) imagery and account for data missed in broader assessments. This "training data" will be used to look at other parts of the world and more precisely identify the percentage of tree cover. Through increasing the understanding of how and why the tree count in Madagascar is growing, we can apply these practices to other related parts of the world to help regain lost forests.

EPIDEMIOLOGY & PUBLIC HEALTH

POSTER PRESENTATIONS, SECTION 1
SECOND FLOOR CONCOURSE, 9:00-11:00 AM

ASSOCIATION OF BLOOD FATTY ACIDS AND GROWTH IN TANZANIAN CHILDREN 2-6 YEARS OF AGE
Samantha Hahn
Category: Epidemiology and Public Health, Section 1
Poster: 247
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)

In Tanzania, 42% of all children are stunted. Dietary essential fatty acids (EFA) are critical for infant and childhood growth and development. However, EFA status of Tanzanian children is poorly described. The objective of this study was to assess the association between RBC fatty acid levels and growth parameters in Tanzanian children 2-6 years of age. Blood samples of children were taken using an antioxidant treated DBS card and analyzed for fatty acids by OmegaQuant (n=335). Weight, height, and head circumference were measured and z-scores were calculated using WHO Anthro/plus. Within the sample, 70% of the children were EFA deficient as demonstrated by a T/T ratio<0.022. No significant association was observed between Z-scores and T/T ratio or mead acid (markers of EFA deficiency). However, height-for-age was positively associated with total polyunsaturated fatty acids and total n-6 fatty acids ($p<.05$). Height-for-age was inversely correlated with palmitoleic acid, oleic acid, total n-9, and total monounsaturated fatty acids ($p<.05$). Linoelaidic acid was positively correlated with weight-for-age ($p<.05$). BMI-for-age inversely correlated with eicosadienoic acid, and a positively correlated with oleic acid ($p<.05$). Weight-for-height was inversely correlated with docosatetraenoic acid ($p<.01$) and lignoceric acid ($p<.05$). These data indicate that there is an association between certain fatty acids derived from EFAs and growth parameters in Tanzanian children aged 2 to 6. Funding Source: iAGRE.

AGE DIFFERENCES IN PARTICIPATION AND SATISFACTION WITH A TEXT MESSAGE INTERVENTION IN CANCER PATIENTS PRESCRIBED ORAL ANTI-CANCER AGENTS
Lauren Calleja
Category: Epidemiology and Public Health, Section 1
Poster: 248
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Sandra Spoelstra (Nursing Research)

Adherence to oral anti-cancer agents (OAs) is often suboptimal (<65%), which may reduce efficacy. Text messages (TMs) have been effective at improving adherence in younger populations; however, studies in older samples are lacking. This cross-sectional study examined age differences among patients who consented to participate in a TM study compared to eligible not consented and the relationship between age and satisfaction with TMs. Inclusion criteria: age >21, prescribed an OA, and owned a cell phone with ability to TM. Of 142 patients screened and eligible, 56.3% (N=80) consented; 40 were randomly assigned to receive TMs. Data on age and satisfaction with TMs were completed via survey. Mean age of consented participants was 58.5 years (SD 10.8; range 39-82) compared to 57.24 years (SD 12.6; range 32-92) for those eligible not consented was not statistically different($p>.05$). Out of 37 completed satisfaction surveys, 30 participants were very satisfied (81%), 4 were somewhat satisfied (11%), 1 was not at all satisfied (3%) and 2 did not reply (5%). No differences in satisfaction with TMs were found by age ($p>.05$). Willingness to participate in a study using TMs did not differ by age; those 65 years of age and older were as satisfied with a TM intervention as those who were younger (<50 and 50-65). These findings support that TMs may be useful to improve adherence in older adults, which is especially important as most patients diagnosed with cancer are older (>50). Further research should be conducted.

THE PRESENCE OF SYMPTOMS IN CANCER PATIENTS PRESCRIBED ORAL CHEMOTHERAPY AGENTS
McKenna Burr
Category: Epidemiology and Public Health, Section 1
Poster: 249
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Sandra Spoelstra (Nursing)

Little research has been done on the presence of symptoms in patients undergoing treatment with oral chemotherapy agents (OA); and even less on symptoms related to certain OAs. Therefore, the purpose of this study was to describe symptoms in cancer patients prescribed OAs. Data was gathered from baseline interviews (n=155) from two randomized control trials on text messaging and adherence. Participants were diagnosed with cancer, over the age of 21, prescribed an OA and owned a cell phone and able to text. Nineteen commonly-occurring symptoms and OA type were assessed via telephone interview. Descriptive statistics was used to describe symptoms by drug. Mean age was 59.25 years, 57.4% female, and 85.8% Caucasian and 10.3% African American. The seven most commonly taken OAs were analyzed, including: Xeloda (n=52), Tarceva (n=16), Afinitor (n=10), Gleevec (n=9), Revlimid (n=9) and Zytiga (n=7). The most common symptom was fatigue, with >55.0% of all

patients experiencing this symptom (Xeloda n=42, Tarceva n=14, Afinitor n=6, Gleevec n=7, Revlimid n=5, and Zytiga n=4). In addition, 55.8% (n=29) of those on Xeloda experienced numbness. Of those on Tarceva, 68.8% (n=11) experienced skin rashes/sores; and 62.5% (n=10) experienced weakness, lack of appetite, and nausea/vomiting. Of the patients prescribed Afinitor, 70% (n=7) experienced a lack of appetite; and 60% (n=6) experienced sleep disturbance and numbness. Nurses should be aware of the common symptoms experienced in patients who are prescribed certain OAs in order to provide symptom management strategies to better assist in managing at home.

LIFESTYLE EDUCATION FOR PATIENTS IN THE HIGH-RISK BREAST CANCER CLINIC
Amanda Niester, Christine Bonamici
Category: Epidemiology and Public Health, Section 1
Poster: 250
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Janet Osuch (Epidemiology)

Attention to breast cancer risk reduction has become an increasing priority since clinical trials have demonstrated the efficacy of the use of risk reduction agents. Women at high risk for breast cancer due to family history or biopsy findings are eager to learn what lifestyle modifications they may employ to keep their risk as low as possible. Our methods included conducting a PubMed search over the past ten years using the key words nutrition AND breast cancer risks. We categorized our findings, addressing intake of 1) quality fats; 2) foods that stabilize insulin levels; 3) fiber; 4) fruits and vegetables; and 5) vitamin D. We also included the importance of weight control, exercise, and avoiding lifestyle, industrial, and medical risks. As a result, we developed a patient education tool to be provided at a woman's initial presentation to the high-risk breast counseling clinic at Michigan State University. The tool explains how lifestyle choices affect the risk of breast cancer, and what a woman might do to keep her risk as low as possible. This educational tool has the potential to serve as an approach to best practices not only in high-risk breast clinic settings, but in venues addressing a variety of other diseases, because many lifestyle changes are not specific to breast cancer. The major advantage of its use is that it empowers patients to promote healthy lifestyles outside of the clinic and into their homes and community.

SECONDARY ANALYSIS OF ORAL ANTICANCER AGENT PRESCRIPTION DOSAGES AND FDA RECOMMENDATIONS
Shane Doane
Category: Epidemiology and Public Health, Section 1
Poster: 251
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Sandra Spoelstra (Nursing)

The use of oral anti-cancer agents (OAs) is increasing, transitioning cancer treatment plans to homes. The purpose of this secondary analysis is to examine if patients were prescribed the FDA recommended dosage for their OAs. Secondary analysis was conducted using data collected during two small randomized control trial studies measuring OA adherence. Data on demographics and OA prescriptions were compiled from baseline interviews. FDA dosage recommendation data were derived from the official FDA website. For the purpose of this secondary analysis, dosages were measured in total dosage per 24 hour period. In total, 155 patients were assessed (n=155). Mean age was 59.34 years (standard deviation [SD] 10.32; range 33-82); 57.4% (n=89) of patients were female; 85.8% (n=133) Caucasian, 10.3% (n=16) African-American, 3.9% (n=6) other. Of the 110 patients who reported staged cancer, 65.5% (n=72) were stage IV. Of the 155 patients, 55.5% (n=86) were prescribed total daily FDA recommended dosage of their OA; 19.4% (n=30) were prescribed more than FDA recommendations; and 25.2% (n=39) were prescribed less than FDA recommendations. The most common OA prescribed was capecitabine, with 35.5% (n=55) of patients having a prescription, most commonly for breast or colorectal cancer. Only 5.5% (n=3) of patients prescribed capecitabine were prescribed the FDA recommended total dosage. Prescription dosages of OAs that exceed FDA recommended amounts could possibly lead to complications in treatment or magnifications of side effects. It is important to note discrepancies between prescriptions and FDA recommendations in order to protect patients and prevent harmful side effects with OAs.

FATTY ACID AND FAT-SOLUBLE VITAMIN PROFILING OF TANZANIAN OILS AND SEEDS
Kelly Valentini
Category: Epidemiology and Public Health, Section 1
Poster: 252
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)

Our laboratory has recently reported that essential fatty acid deficiency is highly prevalent in Tanzanian children and associated with growth and cognitive impairment. It is critical to profile the nutrient composition of local foods commonly consumed so that diet strategies can be developed to target nutritional deficiencies with whole foods. Currently, there are no methods reporting fatty acid and fat-soluble vitamin quantification in a single analysis. The aim of this study was to develop a single

method that profiles fatty acid and fat-soluble vitamins in whole foods. Such a method would decrease costs and increase food analysis efficiency in developing countries. Foods and oils were identified for analysis that were likely to contain fatty acids. Pumpkin seeds, coconut shavings, and oyster nuts were obtained from local village storages, freeze-dried, shipped, and stored at -20ºC until analysis. Sunflower, korie, and red palm oil were purchased from local Tanzanian markets and stored in brown bottles before shipment. A Folch extraction was performed on the samples, followed by acidified methylation to form FAMEs and retinoid esters. Method validation was performed and yielded consistent recovery and reproducibly. Quantification of fatty acids and fat-soluble vitamins was determined using a single GC-MS analysis, and includes identification of 37 fatty acids (i.e. saturated, unsaturated, and polyunsaturated), vitamin E, vitamin A isomers, and plant sterols. We expect to identify and profile the fatty acid and fat-soluble vitamin concentrations in local seeds and oils and use this information to develop diet intervention strategies.

QUANTIFYING A REDUCTION IN PROMINENCE OF ANTIVACCINATION WEBSITES FROM 2002-2015
Allison Fedewa
Category: Epidemiology and Public Health, Section 1
Poster: 253
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Kendra Cheruvelil (Lyman Briggs College)

Using search terms of "vaccination" and "immunization", Davies et al. (2002) found that antivaccination websites dominated the results of seven of the most commonly-used search engines. Following Davies methods, I revisited this idea and conducted three analyses: 1) I used the same seven search engines and search words to examine the top ten web pages listed in the results, 2) I added to the search with three additional commonly-used search engines, and 3) I examined the first 100 antivaccination sites found using Google search. I used the same criteria as Davies to determine whether the resulting pages were antivaccination. My analysis found only one antivaccination site was returned in the top ten results across all ten search engines. When examining the first 100 antivaccine sites, I found similar patterns to Davies results in 2002: many of the sites were celebrity endorsed, showed distrust in the government, or supported the parents right to make autonomous decisions for their children. As compared to 2002, I found in 2015 a decrease in antivaccination prominence in results of commonly searched terms regarding vaccines on ten commonly-used search engines. This is interesting because in the past two years there have been outbreaks of whooping cough and measles as well as other vaccine-preventable diseases. While it seems there is an increase of parents not vaccinating, the prominence of antivaccination propaganda on the web has decreased. Therefore it is likely these parents are obtaining their information from other sources.

GAINING A BETTER UNDERSTANDING OF PEOPLE'S ATTITUDES AND PERCEPTIONS OF VACCINES AND WHERE THEY GET THEIR VACCINE-RELATED INFORMATION
Jenna Mellerowicz
Category: Epidemiology and Public Health, Section 1
Poster: 254
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Kendra Cheruvelil (Lyman Briggs College)

Vaccines have prevented many diseases that historically killed many people and are an important part of public health. However, vaccines are often in the news as being controversial and there have been recent outbreaks of some vaccine-preventable diseases in the US (e.g., whooping cough, measles). One way to increase vaccination rates may be to first better how people feel about vaccines. This is what my Lyman Briggs senior capstone class did last semester. Sixteen LB students created and administered a survey that asked questions about people's attitudes and perceptions of vaccines, as well as their sources of vaccine-related information. The survey was administered both online and in person, with a total of 394 responses. Of those surveyed, 84% thought that vaccines increase society's well-being. Although only 55% of participants had children, 63% of individuals reported being at least somewhat familiar with the current vaccine schedule. Survey participants reported getting most of their information regarding vaccines from their healthcare professionals, government sources, and scientific journals. Our results suggest that most people have a positive outlook on vaccines. In fact, this matches current vaccination rates that are mainly greater than 70%. However, outbreaks can be caused by relatively small numbers of people not vaccinating their children. Thus, future research should focus on better understanding the attitudes and perceptions of those parents who choose not to fully vaccinate.

POSTER PRESENTATIONS, SECTION 2
LAKE HURON ROOM, 1:00-3:00 PM

WHO VS. CDC: ANTHROPOMETRIC DISCREPANCY OF PERUVIAN CHILDREN
Victoria Balogh, Sumaira Hai, Jannet Jones, Zach Reilly, Jake Shermetaro
Category: Epidemiology and Public Health, Section 2
Poster: 257
Location: Lake Huron Room

Time: 1:00 PM-3:00 PM
Mentor(s): Gary Willyerd (College of Osteopathic Medicine)

When assessing pediatric patients on the low end of a growth curve, the Center for Disease Control (CDC) has a higher threshold for the definition of "healthy" compared to the World Health Organization (WHO). Studies have shown a discrepancy between the WHO criteria of malnutrition versus the CDC criteria (Phillips, Shulman 2014). Michigan State University College Osteopathic Medicine (MSUCOM) has been collecting pediatric biometrics from various regions throughout Peru since 2011. The purpose of this study was to investigate the aforementioned discrepancy by applying both the WHO and CDC criteria of malnutrition to a population of Peruvian children. It was predicted that more children would be deemed underweight by CDC guidelines. The CDC uses Body Mass Index (BMI) to measure the height to weight ratio and, therefore, the weight status of children. The WHO measures weight status using Z-score: a measure of standard deviation based on height, weight, and age. A total of n=537 Peruvian children over four years were surveyed. Analysis of collected data verified that the CDC criteria categorized more pediatric patients as underweight. This is significant in that the definition of a healthy child varies cross culturally. The WHO standard of healthy pediatric biometrics is meant to be applicable to children with a wide variety of diets, from all socioeconomic backgrounds (Phillips, Shulman 2014). These results need to be taken into account when evaluating pediatric patients in foreign settings and may prove to be clinically relevant in the United States.

TELEPHONE INTERVIEWER TRAINING
Sara Boydell
Category: Epidemiology and Public Health, Section 2
Poster: 258
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Gwen Wyatt (Nursing)

The purpose is to examine the training requirements for interviewers of a National Institutes for Health grant. Three longitudinal interviews are conducted for this Randomized Clinical Trial (RCT) to test reflexology delivered by a friend or family member in the home for women with breast cancer. Reflexology is a specialized foot therapy utilizing a firm walking-motion pressure designed to enhance Health Related Quality of Life (HRQOL). An adaptation of Wilson and Cleary's HRQOL model is the framework for the study. Interviewers specifically tap the symptoms and functional status components of the model. In this longitudinal RCT, interviewers receive training based on established guidelines. Interviews last 30-40 minutes each, and require strict confidentiality. All five study interviewers are undergraduate student research assistants. Participants receive "call guides" to help them respond to scaled questions, i.e., 1-10. Interviewers are trained to provide feedback by responding with a neutral, conversational approach to facilitate impartial data collection. Special situations such as bereavement, withdrawals, refusals, and attritions are also part of the interviewers' training. Once training is complete and the study Education Coordinator confirms competency, the interviewer begins interacting with patients via telephone. Quality assurance (QA) for accuracy includes audio recordings and review of 10% of interviews by the Education Coordinator. A thank you letter is sent following the final interview, along with a local resource guide for complementary therapies. Comprehensive interview training is vital to obtain quality data for research. The use of guidelines by trained interviewers contributes to accurate data collection and robust findings.

PERCEPTIONS OF ENVIRONMENTAL POLICY REGULATION ON MALARIA PREVALENCE IN LARTEH, GHANA
Mallory Wilson
Category: Epidemiology and Public Health, Section 2
Poster: 259
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Connie Currier (College of Human Medicine), Linda Gordon (College of Human Medicine)

This study examines the reasonably made link between the prevalence of malaria in the community of Larteh, Ghana and the enforcement of environmental policies and population growth. The study also examines the perceived effectiveness of public health (specifically malaria focused) interventions by local community members. Methods included interviews and group discussions as well as analytic coding and discerning responses for trends. Results profiled a correlation between the lack of funding for and focus on enforcing various environmental policies and the rise in local malaria cases.

GARDASIL: A CONTROVERSIAL VACCINE OF MANY FIRSTS
Megan Wudkewych, Briana Ferman, Tiffany Garcia, Gabriela Ralph
Category: Epidemiology and Public Health, Section 2
Poster: 260
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mark Largent (Lyman Briggs College)

The first Human Papillomavirus vaccine named Gardasil was first manufactured by Merck and licensed in June of 2006 (U.S. Food and Drug Administration). This relatively new vaccine is targeted towards young men and women between the ages of

nine and twenty-six. Gardasil claims to protect against two strains of HPV as well as genital warts. Since its appearance in the pharmaceutical market, this vaccine has been marked by many concerns and controversies. It is the first of any vaccine to contain a virus-like particle, have aggressive direct to consumer marketing strategies, target one gender more than the other as well as young age groups, and the first to go to legislators. Many people are hesitant to get vaccinated with Gardasil. We conducted our research by analyzing scholarly articles and government websites. Our goal for this project is to explore the different angles of the vaccine in terms of the composition of the vaccine, policy, and the relation between HPV and cervical cancer.

USING TECHNOLOGICAL INNOVATIONS TO SOLVE NONTECHNICAL VACCINATION PROBLEMS
Emma Vitello, Sarah Domka , Hannah Sauter, Janessa Voelker
Category: Epidemiology and Public Health, Section 2
Poster: 261
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mark Largent (Lyman Briggs College)

Our research project will explore certain non technical complications related to vaccination and ways that new technologies try to solve them. For example, parents were anxious to have their kids vaccinated because vaccines used to contain thimerosal, a mercury-based preservative used to protect the vaccines against bacterial infection. However, once single-use vials were implemented, thimerosal was no longer needed for these smaller vials. One such complication that could be solved involves the spread of major diseases such as Malaria, Ebola, and HIV. We plan to research technologies being developed to combat the proliferation of such diseases, including new vaccines and other unique innovations. We also plan to examine vaccinations in third world and developing countries and the barriers to their deliverance and distribution, such as lack of electricity, health care workers, and money. There is also a concern with the lack of people getting vaccinations due to needle phobia or pain associated with vaccinations. We will look at alternatives to administer vaccinations. Finally, our last research objective is to determine what can improve the effectiveness as well as the efficacy of vaccines. With considerable gains in scientific innovations over the last two decades, there are now promising solutions to these prevalent complications.

INVESTIGATING AN APPARENT CONTRADICTION BETWEEN AUTISM AND VACCINES
Madison Kraus, Stephanie Kittel, Brooke Thomas, Brandon Woodruff
Category: Epidemiology and Public Health, Section 2
Poster: 262
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mark Largent (Lyman Briggs College)

For years there has been a public and professional debate about the alleged relationship between vaccines and autism. Dr. AJ Wakefield's article published in the Lancet in 1998 grew in popularity and many believed it claimed there to be a link between the MMR vaccine and autism. This concern allegedly led many parents to elect to not vaccinate their children in fear of potential complications. As a result, many researchers conducted their own studies about the MMR vaccine to see if there was indeed was a link between the two. The outcomes were overwhelming; researchers failed to find any correlation. Despite this immense scientific consensus, the U.S. Court of Special Masters has decided children may in fact suffer symptoms associated with autism due to an adverse reaction to a vaccination. They are capable of rewarding compensation to families if it is decided the child has been negatively affected by a vaccine they have received. We focused on specific cases that the court has dealt with where families have been rewarded because their children were seemingly either pushed onto the autism spectrum or pushed farther onto the autism spectrum due to a vaccine they had been administered. Our group then serves to debate this contradiction: if there is so much research disproving the correlation between the MMR vaccine and autistic symptoms, then why has the Court of Special Masters compensated families for this vaccine pushing their child onto or further onto the autism spectrum?

A SURVEY OF REGISTERED NURSE ASSESSMENT OF SYMPTOMS AND ADHERENCE AND PATIENT EDUCATION WHEN PRESCRIBED ORAL ANTI-CANCER AGENTS
Kimberly Ridenour
Category: Epidemiology and Public Health, Section 2
Poster: 263
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Sandra Spoelstra (Nursing)

Oral anti-cancer agent (OA) usage is increasing, shifting delivery of cancer treatment to the home setting and responsibility to the patient. Evidence indicates in order to promote optimal treatment, Registered Nurses (RNs) should assess and provide patient education regarding OA adherence and symptom management. This cross-sectional study examined RN assessment of symptoms and OA adherence and rate of occurrence of face-to-face patient education. Thirty-nine RNs from oncology practices in Michigan completed a 35-item survey of demographics and practice patterns. Mean age 50.11 years (SD 9.97, range 24-70), 39 (100%) female, 38 (97%) Caucasian, and 1 Asian (3%). Degrees (23 [59%] ADN; 13 [33%] BSN; 2 [5%] MSN; and 1 [3%]

Diploma) and worksites (26 [66%] office; 12 [31%] hospital; and 1 [3%] retired) varied, and 38 (97%) cared for patients prescribed OAs. Mean self-reported competence ratings were 4.86 (SD 1.87, range 1-9; 0=not competent to 10=extremely competent). Twenty-four RNs (62%) assessed symptoms and 16 (41%) assessed OA adherence all of the time. Fifteen (38%) used a standardized symptom assessment. Eight (20%) conducted face-to-face patient education most of the time, 13 (34%) some of the time, 12 (31%) hardly ever/never, and 6 (15%) did not report. Less than optimal RN assessment of symptoms and adherence and patient education occurred, although evidence shows RN care can reduce symptom severity and improve adherence in patients prescribed OAs. Future research should focus on RN-led models of care incorporating assessment of symptoms, OA adherence, and subsequent education for patients prescribed OAs for cancer treatment.

EXPLORING THE RELATIONSHIP BETWEEN SLEEP QUALITY AND GLUCOSE METABOLISM
Rachel Peterson, Christina Buglione
Category: Epidemiology and Public Health, Section 2
Poster: 264
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Erica Wehrwein (Physiology)

In light of recent studies, the consequences of sleep deprivation have overlapped onto the possibility of prompting altered glucose metabolism. We hypothesized that sleep deprived individuals take longer to regulate blood glucose levels when challenged by a glucose tolerance test and will exhibit higher fasting blood glucose levels in comparison to individuals receiving higher quantities of quality sleep. Subjects utilized a sleep cycle iPhone application to monitor nightly sleep patterns, and glucose meters to track fasting blood glucose levels ere divided into sleep categories: exceptional, obtaining more than 8 hours of quality sleep per night; moderate 5.5-7 hours per night; and poor 2-5 hours per night, as defined by the sleep cycle application. Fasting blood glucose levels for the poor sleep category were 89.8 ± 51.8 mg/dL. Corresponding decreases in fasting blood glucose levels were observed for the moderate (86.2 ± 38.1 mg/dL) and exceptional sleep categories (73.71 mg /dL). The poor sleep category also exhibited reduced blood glucose regulation, demonstrated by a large peak in blood glucose levels to 186.6 ± 19.1 mg/dL, during the OGTT. The moderate category showed significantly lower peaks (p=.029 in ANOVA comparison) at 147.8 ± 9.9 mg/dL, and the exceptional category showed a correspondingly lower peak at 135 mg/dL. This study demonstrates support for a relationship between sleep deprivation and altered regulation of glucose metabolism and warrants interest for further studies to better understand this relationship.

POSTER PRESENTATIONS, SECTION 3
LAKE HURON ROOM, 1:00-3:00 PM

DETERMINING RELATIONSHIP BETWEEN SOCIOECONOMIC STATUS, VACCINE PRICES, AND RECOMMENDED VACCINES FOR CANINES IN MICHIGAN
Elizabeth Lytle, Brooke Sommerfield, Monica Wegienka
Category: Epidemiology and Public Health, Section 3
Poster: 267
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mark Largent (Lyman Briggs College)

The research team will survey veterinary clinics throughout the state of Michigan on their vaccine policy and pricing. One veterinary clinic will be surveyed for each zip code selected, and three zip codes were chosen per county. The prices and policies for each zip code will then be compared to the median household income for each area to determine if there is a correlation between median household income and pricing.

FEASIBILITY OF THE TOOLS FOR TEEN MOMS (T4TM) INTERVENTION: PRELIMINARY RESULTS
Morgan Piccard, Mackenzie Robson, Kellie Shattuck
Category: Epidemiology and Public Health, Section 3
Poster: 268
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mildred Horodynski (Nursing)

Increased maternal responsiveness has been shown to decrease obesity risk. Adolescent mothers are less responsive to their baby's cues compared to adult mothers. Tools for Teen Moms (T4TM) is a social media based educational intervention designed to promote recognition of infant feeding cues and encourage maternal responsiveness. The purpose of this study is to explore beginning feasibility of the T4TM intervention on participant engagement and use of the social media intervention. This study is part of a larger randomized controlled trial with low-income first-time teen mothers. Tools for Teen Moms provides daily text reminders including challenge activities designed to encourage maternal-child interaction. The website provides tips, quizzes, and extra resources on topics related to infant feeding. Website engagement and challenge completions are monitored through

a tracking system. Post-intervention surveys provided participant satisfaction evaluations. Participants are primarily single and over 16 years old. Fourteen participants have completed the intervention. Preliminary feasibility results indicate moderate engagement (62%) and positive satisfaction with the program. Participants completed an average of 26 of 42 challenges and visited the website an average 25 of 42 days. Participants completed 2 of 4 quizzes on average; 10 participants reviewed additional resources on the website. Interestingly, 71% of participants visited the website at least once following completion of the intervention. Participants responded that they found the website helpful and that they would recommend T4TM to a friend. Preliminary evidence suggests a social media intervention can be an effective way to provide teen mothers useful information about feeding their babies.

ASSURING QUALITY AND CONSISTENCY DURING TELEPHONE INTERVIEW DATA COLLECTION
Megan Flanigan
Category: Epidemiology and Public Health, Section 3
Poster: 269
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Gwen Wyatt (Nursing)

The purpose of this secondary analysis was to examine interview protocol for accurately obtaining and recording patient data. Data were collected via telephone within a randomized clinical trial (RCT) of reflexology for symptom management from 286 women with breast cancer. Procedures for data collection in RCTs can have a direct impact on trial outcomes. Rigorous testing of complementary therapies, including standardized data collection, is needed to establish an evidence base for practice. Wilson & Cleary's Health Related Quality of Life (HRQOL) model was adapted for use, specifically targeting cancer symptoms and functional status components of the model. Patients were randomized into one of three groups: reflexology, lay foot manipulation (LFM), or conventional care. Interviews were conducted at baseline, study weeks 5 and 11. Interviewers and patients were blinded to group assignments. Interviewers were trained in delivering questions to facilitate impartial data collection. A total of 709 interviews were completed out of a possible 858 consisting of; 222 (78%) completing week 5 interview and 201 (70%) completing week 11 interview. The primary reasons for missed interviews were sickness, death or hospice (n=17). Quality Assurance (QA) by the study education coordinator on 10% (n=71) of completed interviews calculated the error rate in interview protocol was less than 0.3% for timeliness, execution of data collection and entry. In conclusion, telephone interviews can be used for successful data collection, and a standardized protocol for data collection is critical to obtaining quality data for valid and generalizable findings in nursing research.

MOBILE HEALTH (MHEALTH) PRODUCTS: A NEEDS SURVEY
Michelle Wormser
Category: Epidemiology and Public Health, Section 3
Poster: 270
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Sandra Spoelstra (Nursing)

The need for mobile health (mHealth) technology to support patient care and improve health outcomes is evolving, yet innovations are still needed. The purpose of this analysis is to identify strengths and gaps of innovative mHealth interventions. Experts attending a mHealth convention (n=26) participated in a 12-item open-ended-semi-structured survey on technology innovations. Data on characteristics were collected and analyzed using descriptive statistics. Mean age was 38.9 (standard deviation 12.4; range 29-57); 77% (n=20) male; 77% (n=20) Caucasian and 12% (n=3) each African American and other. Qualitative questions were transcribed, coded, and a thematic analysis occurred. Thirty-five comments emerged from the survey. From these comments, four themes related to mHealth technology innovation needs were identified. Theme 1: 73% (n=19) identified apps, telemedicine, wearable devices, hearing tests, and tablets needed further development for use in healthcare. Theme 2: 26% (n=9) identified devices needed to be linked to electronic health records (EHRs). Theme 3: 15% (n=4) identified cell phone, text-message, or automated-voice-recordings needed to be refined to improve communication with patients. Theme 4: 4% (n=1) identified further research needs to be conducted to fill gaps in knowledge. In addition, 8% (n=2) were unsure. The need for further development of mHealth technology and connection to health records prior to use in healthcare was supported. Nurses are aware that mHealth technology is needed in clinical practice (i.e., Apps, telemedicine, text messaging, and automated voice response) yet the need for further development needs to occur prior to use in clinical practice to support improving health outcomes.

THE MICHIGAN BIOTRUST
Matthew Peters
Category: Epidemiology and Public Health, Section 3
Poster: 271
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ann Mongoven (Religious Studies)

The Michigan BioTrust is a program designed by the State of Michigan to oversee the state's biobank, which stores newborn blood spots for research and personal use. When a child is born, blood samples are taken to test for diseases. These samples are later stripped of personal identifying information and stored, where they have the potential to be used for research. Many people do not know about this procedure, or the consent laws that govern the biobank, which changed in 2010. Children born between 1984 and 2010 have blood spots in the biobank. Under the new policy, parents of these children can chose to "opt out." This means that they can chose to disallow the use of their children's blood spots for research, or have the blood spots destroyed. Parents of children born after May 1st, 2010 can "opt in" to allow their children's blood spots to be stored for research purposes and personal use. To better inform the public about the BioTrust and the biobank, an NIH grant was created. In a joint effort from Michigan State University and the University of Michigan, I worked under Professor Ann Mongoven to create an online public education tool that could be used to inform Michigan residents about the biobank. The tool itself is a multimedia presentation which utilizes PowerPoint, survey questions, and narration in three languages. This poster will demonstrate the objectives, process and results of the tool's creation, and will highlight my role in its completion.

PATIENT PERSPECTIVES ON ADVANTAGES AND DISADVANTAGES OF ORAL ANTI-CANCER: A THEMATIC ANALYSIS
Sarah Rausch
Category: Epidemiology and Public Health, Section 3
Poster: 272
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Sandra Spoelstra (Nursing)

Little is known about patient beliefs on the advantages and disadvantages of cancer treatment in pill form. A qualitative thematic analysis was conducted on 151 comments taken from exit interviews of 68 patients prescribed oral anti-cancer agents (OAs) who were enrolled in a randomized control trial on the feasibility of text messaging to promote medication adherence. An iterative process occurred until themes emerged on OA advantages and disadvantages. Mean age was 58.5 (Standard Deviation [SD] 10.9); 60.3% (n=41) female; 85.3% (n=58) Caucasian, 10.3% (n=7) African American, and 4.4% (n=3) Hispanic. Fifteen types of cancer were experienced and 22 different OAs were prescribed. Five themes emerged from 81 comments regarding advantages. Theme 1: 64.2% (n=52) stated convenience. Theme 2: 23.5% (n=19) did not like the IV experience. Theme 3: 8.6% (n=7) experienced fewer or less severe side effects. Theme 4: 1.2% (n=1) stated the pills were easy to obtain. Theme 5: 2.5% (n=2) reported no advantages. Seven themes emerged from 70 comments regarding disadvantages. Theme 1: 24.3% (n=17) stated side effects. Theme 2: 14.3% (n=10) forgetting to take their pill. Theme 3: 4.3% (n=3) pill size (difficulty swallowing). Theme 4: 2.9% (n=2) OA not working. Theme 5: 1.4% (n=1) carrying OA with them. Theme 6: 1.4% (n=1) longer treatment. Theme 7: 51.4% (n=36) reported no disadvantages. Knowing patient perception of advantages and disadvantages of OAs allows clinicians to be more informed when deciding course of treatment that will be most effective at promoting adherence for each patient.

ASSOCIATION BETWEEN THE DASH DIET AND BLOOD PRESSURE IN WOMEN
Diana Xu
Category: Epidemiology and Public Health, Section 3
Poster: 273
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition), Claudia Holzman (Epidemiology and Biostatistics)

The Dietary Approaches to Stop Hypertension (DASH) diet lowers blood pressure (BP) in some populations. However, the effect of the DASH diet on blood pressure in middle-age women is poorly studied. To determine if the DASH diet was associated with BP, anthropometric and Block food frequency data collected at follow-up were analyzed from a subset of women (25–50 yrs, N=677) who participated in the Pregnancy Outcomes and Community Health (POUCH) Study (1998–2004). The DASH diet score was the sum of eight component scores calculated using a modified Fung's DASH diet index. The index is based on rankings for intakes of fruits, vegetables, whole grains, nuts/seeds/legumes, sodium, sweets, meats/poultry/fish and total dairy products. The total DASH score was divided into quartiles for analysis (lowest quartile = poorest adherence). Weighted regression models were run to estimate the means of systolic BP (SBP) and diastolic BP (DBP) for quartile 1 vs. 2-4 of DASH scores. Adjusted models controlled for maternal age, race and season at enrollment. Women in the lowest quartile had a higher mean blood pressure compared to women in quartiles 2-4: SBP (119.2 vs 115.8 mmHg, p=0.03) and DBP (78.7 vs. 76.3 mmHg, p=0.04). When stratified by BMI, the DASH diet and BP association was primarily found in non-obese women. The DASH diet adherence was associated with lower blood pressure in some, but not all POUCH study women. These findings motivate us to further explore the effect modification by women's BMI.

GRAPHIC DESIGN

POSTER PRESENTATIONS, SECTION 1
LAKE HURON ROOM, 9:00-11:00 AM

SECRETS OF THE DEAD: CONNECTING PROFESSIONAL INSIGHT WITH MUSEUM EXHIBITS AND AUDIENCES THROUGH A SHARED INTERFACE
Sarah Rydel
Category: Graphic Design, Section 1
Poster: 276
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

The Ancient Egyptian exhibit at the DIA is a mystifying and thrilling experience for audiences of all ages. While the on-site experience is compelling, museums are increasingly challenged with engaging audiences in the digital space. Additionally as experiences in digital space become even more personalized, the need for a personalized interaction with on-site experiences becomes imminent. This research explores questions surrounding what inspires, motivates, and interests the modern population to attend a museum exhibit. The thirst to express knowledge and insight is a basic human instinct. The desire to share is an experience modern communities in the digital age thrive on. Could the creation of an accessible database of exchangeable opinion and knowledge for professional input and public access reflecting the relationship between ancient and contemporary medical knowledge encourage conversation to increase contribution to the museum as an ever-growing vessel of information as a generational paradigm?

DESIGN A DEER: ENGAGING MUSEUM VISITORS WITH CREATIVE EXPERIMENTATION
Katelynn Humble
Category: Graphic Design, Section 1
Poster: 277
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

The Michigan State University Museum Diversity of Habitats exhibit is an information-rich environment. The exhibit features the seven main habitats that are located within Central and North America. The exhibit is text heavy with no takeaway item to enforce the information. Many visitors glide through the Diversity of Habitats exhibit without focusing much attention to learning the information. I propose the game Design a Deer to tackle this dilemma. The goal of Design a Deer is to give the exhibit significance and showcase how the information is applied in real life. Design a Deer takes information about how deer and Prong-horned Antelope have adapted to each of the habitats and integrates it into a creative experience. Users can apply the information they learned to create a deer and place it into one of the habitats to see how well it is adapted to the climate and resources available. Games create an engaging atmosphere that tempts users to learn without making the task feel forced. Interactive museum activities challenge and entertain visitors making the visit more informative and memorable. A lasting experience prompts visitors to share their visit with others and raises the possibility of returning to the exhibit.

WALK THROUGH TIME WITH CAVEMAN TUNK: USING GAME DESIGN TO INCREASE THE ACCESSIBILITY OF MUSEUM CONTENT FOR YOUNG CHILDREN
Victoria Spady
Category: Graphic Design, Section 1
Poster: 278
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

The Michigan State University Museum is a great place for learners of all ages to explore new subjects. In the basement of the museum is the Hall of Evolution. While the content leading into the hall of evolution is tailored to multiple audiences, the content inside the hall itself is not accessible to early school-age children. This challenge, combined with an increasing need for museums to engage visitors through various digital media, inspired me to investigate how I might help children on field trips learn about the content of exhibits such as the Hall of Evolution in a fun, interactive way. Walk Through Time is a proposed interactive experience that more deeply connects young museum goers with the content of the exhibit and makes the information more accessible and fun. Seamlessly integrated into the exit experience at the exhibit itself, students would be introduced to the game and create their own caveman or cavewoman avatar. By using the information given them on a small printout, students would be able to continue their adventure after returning home, interacting with and learning about the flora and fauna of various historical epochs in a richly-illustrated journey through time on the MSU museum's website.

ADDLIGHT: EXTENDING THE CONTENT OF "SPECTRUM" BEYOND THE WALLS OF THE EXHIBIT
Madeline Tatro
Category: Graphic Design, Section 1
Poster: 279
Location: Lake Huron Room

Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Impression 5 Science Center is a dynamic, interactive space for families to explore and challenge their understanding of science. One of their most popular exhibits, "Spectrum," educates visitors in the area of light sources, lenses, prisms, mirrors, and more. My research in museums and visitor engagement led me to understand that the best museum is one that presents a variety of material and experiences that appeal to different age groups and education levels. Visitors expect to be both mentally and physically engaged and Impression 5's "Spectrum" does just that. My question is – how do we expand visitor engagement beyond the walls of the exhibit? In an attempt to continue the learning process outside of the museum, I have created ADDLIGHT, an application that instills the idea of additive color mixing. Within ADDLIGHT, users are able to create their own light mosaics with just three pegs: one red, one blue, and one green. With these three colors, they are able to combine or "mix" pegs to create an additional four colors: yellow, cyan, magenta, and white. Through a process called scaffolding, users are introduced to more colors as the mosaics become more challenging and advanced. It is up to them to figure out which colors to combine in order to create the desired outcome, leading to deeper and longer lasting knowledge about the visible spectrum as well as positioning the museum as a resource beyond its own walls.

COLOR MY WORLD: MOBILE APPLICATION FOR IMPRESSION 5'S SPECTRUM EXHIBIT
Kristen Giuffrida
Category: Graphic Design, Section 1
Poster: 280
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Museums are a great way for people to socialize and learn new things. Impression 5 is a children's science museum in Lansing, Michigan. The museum tends to attract a lot of children and families. Impression 5's Spectrum exhibit was very impressive and fun. Museums are trying to find ways to keep people interested in coming to the exhibit and to further their education and enjoyment outside of the museum. Studies have shown that the more interactive a museum is, the more people will enjoy their experience and further more want to come back to the museum. I would like to propose a mobile app for the Spectrum exhibit that would take the interaction to the next level. This would allow people of all ages to learn more about the color spectrum and play in fun challenges and activities. The app would have the user take advantage of the mobile camera and apply their spectrum knowledge to the real world. This app allows children, teens, and adults to further their knowledge before or after seeing the exhibit and would provide a fun way for families to bond.

MUSEUM DIGITAL INTERACTIVE EXPERIENCE
Morgan Kelly
Category: Graphic Design, Section 1
Poster: 281
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

With the introduction of Web 2.0 technologies, museums struggle to interact with their audience once they leave the physical walls, but what if there was a way to keep viewers engaged and interested, even after they have seen what the exhibit has to offer? This research delves into the making of a digital interactive experience that prompts the user to make connections to the works of art, enhancing their understanding of artworks they may have otherwise not responded to while physically browsing the museum. The Future Returns: Contemporary Art from China exhibit at the Broad Museum provides an opportunity for these connections to be made. The audience may not be familiar with the Chinese culture, but they are able to cross cultural barriers by making connections between works, providing a visual six-degrees of separation that is catalogued for further understanding and jumping points for new connections to be made. This experience not only helps the user, but the museums as well, providing a visible database of different interpretations made from a particular work of art in an exhibit.

HABITAT LEARNER: INVESTIGATING THE POTENTIAL OF DIGITAL MEDIA TO ENGAGE CHILDREN BEYOND THE WALLS OF THE MUSEUM EXHIBIT.
Jessica Ferro
Category: Graphic Design, Section 1
Poster: 282
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Habitat Hall, an exhibit at the MSU museum, shows seven different habitats, including the plants and animals that live in them. Children, however, probably don't know what these animals and plants are. A pre- and post- visit experience could enable these children to understand what they would see in the exhibit before they get there, and would give a follow up on the animals they

still wish to learn about. When doing research, I tried to find museums that prepare children for their different museum exhibitions. What I came to find was that museums would post an "activity" on their website. This "activity" would be either a word search, or a coloring activity. None of which educate the child on the exhibit they'll be seeing. After concluding this research, I am proposing a mobile application to go with the Habitat Hall exhibit at MSU. I developed personas that would interact with the application, and scenarios on how a child would learn about different habitats before they attend a field trip at the museum. As a pre-visit experience, the child would use the Habitat Learner application with their parents to learn about which habitat they live in. Using a cut out of an animal from the museum, the application would then have a post-visit experience that would allow them to scan the animal and see one in a live feed. Parents can now, through a mobile device, make this museum's exhibit come to life while having fun with their children.

SEAL MAKER: DEEPENING THE MUSEUM VISITOR'S UNDERSTANDING OF CHINESE CULTURAL HISTORY THROUGH EMERGING TECHNOLOGIES
Zhijing Song
Category: Graphic Design, Section 1
Poster: 283
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Future Returns is a diverse and thought-provoking exhibit about contemporary art from China at the Eli and Edythe Broad Museum. Much of the work in the exhibit remains a strong local understanding of Chinese history and explores the impact of transformation that address China's change with which western viewers may not be familiar. Seal maker is an application design for a hybrid interactive experience incorporating a mobile application and 3D printing to connect museum visitors with a significant aspect of Chinese cultural history and simultaneously position the museum as a resource whose reach extends beyond its own walls. This application only needs several steps of designing one's own wax seal, which a user can then share and even send to be 3D printed for their own personal use. Responding to recent research suggesting that museum visitors increasingly seek participatory experiences around museum content. The application allows users to make and share a seal that is meaningful to them, while at the same time learning about a visual theme of the exhibit that may not have been immediately obvious. Such an experience not only offers the opportunity for a more participatory interaction with the content of a museum exhibit, but it can serve to promote cultural exchange as well.

POSTER PRESENTATIONS, SECTION 2
LAKE HURON ROOM, 1:00-3:00 PM

FLIPPING THE SCRIPT: CREATING AMBIGRAMS
Nathan Revard
Category: Graphic Design, Section 2
Poster: 286
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Ambigrams are the perfect mixture of math, science and art; all combining together to create a medium that is intended for demographic groups of all interests, bridging the gap for users to enjoy all three topics at once. Flipping The Script is a mobile application designed for smartphones that allows the user to recreate a series of ambigrams at a variety of difficulty. Using your finger, the user traces in missing portions of the ambigram to show and create an understanding of how symmetry, visual oppositions, and patterns at different scales work cohesively to construct a unique, and eye catching art piece. The mobile application will also offer information on Michigan State Museum updates, and a feed of example ambigrams. The intent of this project is to show the user how math, science and art work together, and how important each topic is. Students seem to always enjoy or one the other, belonging to either the left or right side of the brain, and this application demonstrates why people can and should respect, and enjoy a variety of educational topics. Amidst the design process, I conducted scholarly research, exhibit observation, persona development as well as studying design principles, After a general layout of information and ideas, I moved into the creation of wire frames, and in depth design processes such as color selection, layouts and actions to form an a smooth and basic interface for the user to work with.

EVOLUTION SIMULATOR: USING DIGITAL MEDIA TO EXPLORE NEW MODES OF INTERACTION WITH MUSEUM CONTENT
Karen Rodriguez
Category: Graphic Design, Section 2
Poster: 287
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

The Hall of Evolution at the Michigan State University Museum contains a great deal of information about the history of life on

Earth. This information, however, is not designed to be experienced in multiple ways by different kinds of learners. Additionally, in an age when museums are working to identify new strategies for audience engagement, such content-rich exhibit presents an opportunity to extend the museum experience both before and after the visit. Responding to this opportunity, I have designed Evolution Simulator, a proposal for a digital experience that would allow middle- and high-school aged youth to experience the content of the exhibit in a different way. Learners can select the fossil of any time period and watch it come to life, responding to environmental conditions. Learners can change the settings of an environment – such as temperature, oxygen, and humidity levels – to see how it affects the creature. This is something that can teach all of us how the environment can change everything around it including vegetation and creatures no matter how small or how big they are. It is also a very interactive way to help young people learn about the earth millions of years ago and how much little changes can impact animal and plant life.

YOURTERMS: UNDERSTANDING WHAT YOU'RE SIGNING UP FOR
Ryan Brough
Category: Graphic Design, Section 2
Poster: 288
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Today, technology and networking are large aspects of daily life for almost everyone, especially college students. Whether it's a site, app, or program there is always some sort of interaction between users and technology. The technology exhibit at the MSU Museum puts a lot of focus on the safety aspects of networking, such as Terms & Conditions agreements. The problem with most college students is that they see the Terms & Conditions and agree to them without actually reading them. By doing this, thousands of people put themselves at risk of legal ramifications and public humiliation over a multitude of diverse medias. I argue that the solution to this problem begins with awareness and accessibility. YOURTerms is a proposed digital service that will provide users with the privilege of informed choice making. The YOURTerms app will aim to: give simplified Terms & Conditions for websites and apps so that they are easy to understand; provide a simple name search of apps, with filter options for app type; and integrate with existing websites and apps to display these simplified Terms & Conditions when new users attempt to create a new account. In addition to this basic functionality, I propose here a partnership with the MSU law school which would allow users to inquire more about legal matters related to digital services.

BEYOND THE MUSEUM: ENHANCING THE POST-EXHIBIT EXPERIENCE
Christie Evenson
Category: Graphic Design, Section 2
Poster: 289
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

The interactive experience with work in a museum is very limited to the point that it is increasingly unnecessary to visit a museum at all. In understanding the work to a greater extent, a viewer needs to consider and discuss it beyond the walls of the museum or computer screen. In researching this idea, I visited the East Lansing 2030 exhibit at the Eli and Edythe Broad Art Museum, documenting the experience before, during and after my visit. The nature of the work presents a perfect opportunity to allow viewers to continue the discussion into the city of East Lansing. With this intent, I will present a design for a mobile app. At specific locations users would find a sign directing them to use their app, presenting a visual display of the space they are in, and what designers envision it to look like in 2030. By physically being in the space, visitors can gain a better perspective on the proposed changes to it. Additionally, the app would include an interactive element, where visitors could comment on changes they would like to see for the space or aspects they like in a designer's vision.

SCIENCE OF ALCOHOL
Kelly Mackie
Category: Graphic Design, Section 2
Poster: 290
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Alcohol education programs have not been associated with being effective in the prevention or overall decreased participation in the consumption of alcohol in college age students. The only positive outcome of these programs has been an increase in knowledge of the risks and effects. With the understanding these programs have failed to change behavior, I am proposing to create an alcohol education program held at Impression 5 children's museum in Lansing, MI — a philanthropy event for groups/clubs/parties to learn about the science of alcohol and raise money for a cause of their choice. The event would be centered around team activities facilitated by SmartGlass, a barcode enabled shatterproof drink glass. SmartGlass will assist in taking a typically one-sided didactic encounter to an engaging evening of education exemplifying Impression 5's core values –

Play. Create. Challenge. Guests would use this glass to interact with exhibits specifically tailored to alcohol education, track their performance throughout the night, serve as a glass to hold their beverages, would be taken home to be used the key to unlocking their score of their overall performance and fundraising totals from the event through a microsite, and finally, function as a regular drink glass for future use. It is my hope this program will give college age students the tools and knowledge to safely enjoy alcohol while raising money for a good cause, and positioning Impression 5 as the premiere destination for alcohol education and philanthropic events for college age students.

DESIGN A PREDATOR: PHONE APPLICATIONS AS INTERACTIVE DESIGN INTERVENTIONS TO ENRICH THE NATURAL HISTORY MUSEUM EXPERIENCE
Katelyn Lewis
Category: Graphic Design, Section 2
Poster: 291
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Natural history museums have long been known for their means of collecting and preserving culture for the general public. Too often this knowledge and education resource is information led and rarely interaction driven leaving users underwhelmed or with no better understanding of the content. Research has shown that the general public wants to visit museums, be engaged, and gain more from their experiences than just reverential viewing of these artifacts. Extending the museum experience with design interventions (the addition of interaction before or after a museum visit) can greatly bolster museum visitor interpretation of content, as well as enjoyment of the museum visit. I am proposing a mobile application that presents the content of the MSU Museum's Hall of Animal Diversity in a fun and engaging way. The mobile app will allow visitors to further explore the exhibits concepts of animal adaptations due to natural selection pressures in an easily interpretable way. Following the Smithsonian Institution's guide to interactive design the user would play this app like a game that transforms their household pet into a wild, hunting predator. The user, as a natural selection decision maker, determines whether the newly created cat or dog creature survives.

THE EAST LANSING 2030 MOBILE APP: AN INTERACTIVE PEER-TO-PEER DIALECTIC PLATFORM THAT PUTS THE FUTURE OF EAST LANSING AT THE COMMUNITY'S FINGERTIPS
Adriana Dragovic
Category: Graphic Design, Section 2
Poster: 292
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

"East Lansing 2030: Collegeville Re-envisioned," an exhibit at the Eli and Edythe Broad Art Museum, is an inspiring look at the future of East Lansing. While presenting a variety of compelling visions for the city from leading designers and architects, the exhibit does not offer opportunities for visitors and community members to participate in the conversation. With the increasing desire for museum-goers to engage in experiences beyond the physical exhibit, I argue that there is an opportunity to offer visitors of the East Lansing 2030 exhibit a chance to take part in a discussion about the future of the city. The East Lansing 2030 App is a proposed mobile experience that allows visitors to select their favorite projects and submit comments describing why they should be a priority for the city. The app also notifies users with updates from the discussion feed and displays rankings of the top voted projects. This app gives members of the community the opportunity to contribute to a conversation that could eventually determine the future design of the city, and situates the museum as a key resource in this conversation.

THE MUSEUM EXPERIENCE: USING DIGITAL INTERACTION TO ENGAGE VISITORS
Shennelle Anthony
Category: Graphic Design, Section 2
Poster: 293
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zachary Kaiser (Art, Art History, and Design)

Traditionally, museums have been considered an environment for learning. Based on my readings of John Falk's, Identity and the Visitor Experience, research on American museums indicate that many visitors are vaguely aware of an exhibit's content. Therefore, my research is focused on a process that would encourage visitors to be more engaged with the content of an exhibit. The result is an application called ID Me, based on John Akomfrah's exhibit, Imaginary Possessions, which poses questions on identity and memory. My process began by visiting the exhibit at the Eli and Edythe Broad Art Museum, where I observed a lack of interest by many visitors. The main question that came to mind was, "how could the museum create an experience for visitors that would gain their interest?" The process would begin before the museum visit by informing prospective visitors about the exhibit and posing a thought provoking question about identity. This would create an interest to visit the museum and the exhibit in particular. After the museum visit, visitors are able to download the app ID Me, where they

can document their response to the question and take a self portrait. Their text would rearrange in the form of their self portrait and it would be documented to the museum's website as part of a large digital exhibit. By integrating digital media into the museum experience, it is possible for museums to make visitors feel a part of the experience while gaining the interest of a wider audience.

HISTORY, POLITICAL SCIENCE, & ECONOMICS

ORAL PRESENTATIONS, SECTION 1
LAKE ERIE ROOM, 9:00-10:30 AM

EXPLORING THE RELATIONSHIPS BETWEEN INFLATION, UNEMPLOYMENT AND INEQUALITY ACROSS 51 U.S JURISDICTIONS
Xuanyu Fu
Category: History, Political Science, and Economics, Section 1
Location: Lake Erie Room
Time: 9:00 AM-9:15 AM
Mentor(s): Aeimit Lakdawala (Economics)

The U.S has been plagued by increasing inequality since the 1980's. In the attempts to address the relationship between inflation, unemployment and inequality, some studies have shown that lower inflation and unemployment improves the conditions of the poor using cross-country analysis. This paper investigates the link between inflation, unemployment and inequality on the state level in both the short run and the long run. The analysis utilizing panel set data indicates lower unemployment is associated with a decrease in inequality in the short run. The cross-section evidence shows that low inflation and low unemployment are related to an improvement in degree of inequality. Overall, we found that the long-run relationships are quantitatively larger and more significant than the short-run relationships. Hence we conclude prolong periods of lower inflation and unemployment rates are likely to permanent improve the well-being of the poor.

GLOBAL POLITICAL CHANGE 1914-1946
Veronica Stachurski
Category: History, Political Science, and Economics, Section 1
Location: Lake Erie Room
Time: 9:15 AM-9:30 AM
Mentor(s): Malcolm Magee (History)

From 1914 until 1946 Europe and the world experienced massive political upheaval and change. The World that existed in 1914 disappeared and the world we live in today was born. The focus of this research is on; what were those changes, what caused them, and what are the consequences for us today.

THEORETICAL FRAMEWORK FOR DEMOCRATIZATION IN PRACTICE: THE CASE STUDIES OF ARGENTINA AND URUGUAY
Matthew Sobecki
Category: History, Political Science, and Economics, Section 1
Location: Lake Erie Room
Time: 9:30 AM-9:45 AM
Mentor(s): Rodrigo Pinto (James Madison College)

Argentina and Uruguay have an intertwined history since the South American wars of independence. They are torn between a past to be overcome to move towards a liberal democratic future. As Tocqueville warns it would be wrong to assume that these two traditions of the past and future can not coexist and develop in parallel. "That would be unjust, for these societies (aristocratic and democratic nations) differing enormously between themselves" to be impossible to carry ideas/traditions from the past into the future. The future being the liberal democratic state Argentina and Uruguay are currently working towards. It is not necessarily a binary choice between the two. The end result of the democratization process in these states may not resemble that of the United States who so often Latin states have tried to imitate. The process in both states may end in a yet to be defined morphed society where an individualistic liberal democratic society has been welded together with their respective pasts. This study examines how culture, law, non-militarism, migration, civic-associations, and economic well being act to democratize. These five ideas will be the focus used to construct a theoretical framework combined with the fictionalities drawn upon from the work of Roberto DaMatta upon which the experiences of Argentina and Uruguay can be placed. Both states have faced authoritarianism in their past and look forward to a (hopeful) democratic future. Much like Dona Flor in the famous work by Brazilian Jorge Amado the states are torn between two existences.

DESTINY AND GLORY: NARCISCO LOPEZ AND THE ANTEBELUM CUBAN FILIBUSTERS
Kevin Cunningham
Category: History, Political Science, and Economics, Section 1
Location: Lake Erie Room

Time: 9:45 AM-10:00 AM
Mentor(s): Bailey David (History)

This paper explores the adventures of the American filibuster during the antebellum period. The American public saw Filibusters as both barbarous privateers and heroes during an age of racial and political tension. These men looked to conquer lands in the name of America and saw land acquisition as a sign of power and prestige. Men such as Narcisco Lopez, a Venezuelan native, embraced the ideology of 'continentalism' and embraced the phrase coined by John L. O'Sullivan, "Manifest Destiny." Lopez was able to gain support during the antebellum period to try to invade Cuba and take it as part of, what Walter Johnson highlights in his book, "The Dark River", the 'Cotton Empire'. I will contend in this paper that there were many more moving pieces to the desire to gain Cuba and show that people throughout the country, northerners and southerners, were willing to take part on these expeditions. This paper, then, intends to explore these men on their escapades and how the American public and government handled their actions.

BIG TEN FIELD HOCKEY RULE CHANGE
Rebecca Stiles
Category: History, Political Science, and Economics, Section 1
Location: Lake Erie Room
Time: 10:00 AM-10:15 AM
Mentor(s): Lawrence Martin (Economics)

My name is Becky Stiles and I am a senior majoring in economics and I am currently taking the course EC499 with Professor Martin. I will be presenting research I have been collecting in this class for my senior project. My topic is going to be about a 2009 rule change in Division 1 Collegiate Field Hockey that has affected the game in numerous ways. I have been collecting data from Big Ten Conference Field Hockey games and will run regressions to find out the specific impacts of this new 'self start' rule. Has this rule sped up the pace of the game? Are there more goals scored? Is the game more physical? Being a student-athlete and a Michigan State field hockey player, I will be able to use my experience and passion to dig deeper into this rule change to find the affects.

ANTI-ZIONISM TO ZIONISM: REFORM JUDAISM AND TEMPLE BETH EL OF DETROIT'S ALTERNATE COURSE
Laura Williams
Category: History, Political Science, and Economics, Section 1
Location: Lake Erie Room
Time: 10:15 AM-10:30 AM
Mentor(s): Kirsten Fermaglich (History)

The Reform movement in Judaism was founded on the ideas that Judaism was strictly a religious faith and not a nationality or race. When the Zionist movement (a call for the establishment of a Jewish homeland) grew at the turn of the century and continued to grow throughout the twenties and thirties, the Reform movement was at odds with this new drive that contradicted its core values. My research begun with asking the question of how the Reform movement went from anti-Zionist in its roots to declaring support for a Jewish state in 1937. Historians argue that after the violence towards Jews worsened in Europe in the thirties and forties, Reform Jews found a way to connect these ideals. However, my research looks deeper at one synagogue that did not necessarily fit that timeline. Temple Beth El was the first Jewish congregation in Michigan and one of the first Reform synagogues in the nation. It was and continues to be a prominent synagogue in the Metro-Detroit area. I researched how Temple Beth El and its leaders behaved during this change as a case study regarding the shift from anti-Zionism to Zionism in the Reform movement. My research has proven that the leader of the congregation was an outspoken anti-Zionist until the late 1940s. It shows that Beth El is a rare case of prolonged anti-Zionism and despite the many historians' positions that the movement was in support of the state of Israel by the 1940s, Beth El struggled much longer.

ORAL PRESENTATIONS, SECTION 2
LAKE ERIE ROOM, 11:00 AM - 12:15 PM

FRAMING FOSTER CARE: HOW POLITICAL PREFRENCES SHAPE THE SYSTEM
Robert Parsons
Category: History, Political Science, and Economics, Section 2
Location: Lake Erie Room
Time: 11:00 AM-11:15 AM
Mentor(s): Sarah Reckhow (Political Science)

The purpose of this study is to show that foster care legislation in the United States may not be a truly bipartisan effort. As well as that the two political parties frame the issue of foster care differently and that these frameworks are reflected in foster care policies and that they change when a different party controls Congress. This study analyzes quantitative data gathered from pieces of legislation, the hearings that surround them, and the text of the legislation itself. As well it traces the process by which some of these policies came to be. In doing this study we hope to debunk the myth that the two political parties completely agree on foster care policy, and show that their frameworks play a major role in creating different solutions. What seems like a

bipartisan solution may simply be the opposing political party going along with a policy so they are not labeled as anti-foster care.

FROM TECHNICAL ASSISTANT TO TOTAL ANTAGONIST: STANLEY SHEINBAUM AND VIETNAM
J Andrew Stables
Category: History, Political Science, and Economics, Section 2
Location: Lake Erie Room
Time: 11:15 AM-11:30 AM
Mentor(s): Rodney Phillips (James Madison College)

This research investigates how former Michigan State University (MSU) economics professor Stanley K. Sheinbaum's opposition to American state building in Vietnam contributed to the Antiwar Movement. As campus coordinator of the MSU Advisory Group (MSUG), Sheinbaum acted as liaison between the university and its technical aid group based in Saigon, the South Vietnamese capital. Initially supporting the MSUG's efforts, Sheinbaum's role as campus coordinator exposed him to information that eventually made him question U.S. involvement in Vietnam. My research explores Sheinbaum's early critiques of technical assistance and rising American antiwar sentiments by exploring his initial support of the MSUG, where his critiques of the MSUG arose, and how his role in the Teach-in/Antiwar Movements shaped broader national sentiments on American involvement in Vietnam. I conclude Sheinbaum's ability to make clear, academic arguments about why American technical assistance policies were counterproductive made him a leading academic in the American Antiwar Movement.

TRANSNATIONAL NETWORK INFLUENCE ON GREAT POWERS: THE CASE OF GERMANY AND RUSSIA
Paul Rose
Category: History, Political Science, and Economics, Section 2
Location: Lake Erie Room
Time: 11:30 AM-11:45 AM
Mentor(s): Mark Axelrod (James Madison College)

Much international relations research has focused on the role of transnational networks, or networks of NGOs, businesses, policy institutes, and think tanks that transcend state boundaries, in influencing state behavior. Most of this research focuses on networks influencing behavior of developing states. Fewer texts look at networks between great powers, showing that there is not much influence in these cases with human rights (Risse et al. 2013). In this research I contribute to the knowledge gap of transnational private influence on major powers and seek to understand the conditions that open the possibility for effective influence by transnational networks on powerful governments. Empirically, I focus on German actors influencing Russian state energy behavior. I interviewed subjects from NGOs and policy institutes in Berlin that work on energy and climate issues and who are experts on Russia specifically. I also use statements from German Green Party members, along with press releases from Gazprom (Russian gas company operating in Germany) and Wintershall (German gas company operating in Russia). Secondary sources also further assess the degree of German influence. I find that effectiveness of transnational influence from Germany depends on degree of economic interdependence. More specifically, Germany's status as a critical export market for Russian energy, its position within EU jurisdiction, and the changed relevance of historical ties with Russia due to the Ukraine crisis allows for effective influence of Russian behavior by influencing the domestic German market. Direct pressure on Russia, as previous literature confirms, does not work effectively.

GENDER'S ROLE IN LEADERSHIP OF CENTRAL BANKS
Nicholas Waterbury
Category: History, Political Science, and Economics, Section 2
Location: Lake Erie Room
Time: 11:45 AM-12:00 PM
Mentor(s): Cristina Bodea (Political Science)

The link between gender and central bank appointments has not received much attention in academic research. By comparison, there is a growing literature trying to understand why some countries have more female representation in parliaments or studying women's decisions to become political candidates. The very conspicuous absence of women in high-powered positions in the world's most important central banks has, however, attracted significant media attention in the past years. The nomination and the subsequent appointment of the US Federal Reserve chair Janet Yellen gave the media an opportunity to note, for example, that developed countries face a greater gender gap in appointments to the central bank than developing countries. It also opened questions into why is it the case that women are so highly under-represented in the central banking profession. In this project we examined the staff directories of the central banks complied by Morgan Stanley from the years 1998-2010. We believe it to be the case that left wing governments nominate and appoint more women to top central bank position, because left wing parties have traditionally been associated with more progressive social agendas. As another example, the absence of strong professional networks and, thus, of trust relationships with politicians, may also be reflected in fewer appointments for top positions in those central banks that, by law, are designed to be institutionally more independent from politics. Our findings in this case support such claims and show additional correlations for further academic research.

THE 7.2%: WOMEN OF COLOR IN POLITICS

Sohela Suri
Category: History, Political Science, and Economics, Section 2
Location: Lake Erie Room
Time: 12:00 PM-12:15 PM
Mentor(s): Melissa Fore (James Madison College)

This project analyzes women of color in the Michigan House of Representatives to underscore the truth of the current inequitable political atmosphere. This research, primarily, draws upon observations of State Representative Stephanie Chang, the first Asian-American female in Michigan legislature; it also examines events, such as press conferences and caucus events, in addition to interviews with the representatives, and it uses secondary sources, such as news articles, philosophical theses and scholarly journals, as a means of deepening the examination. The focus of the study makes clears that these politicians are not viewed equally in comparison to their male and white counterparts. Moreover, this case example undermines the notion of an unprejudiced legal system and critiques the different types of issues women of color face in politics.

HUMANITIES & PERFORMING ARTS

ORAL PRESENTATIONS, SECTION 1
LAKE SUPERIOR ROOM, 9:00-11:00 AM

LAURIE ANDERSON'S "SLIMY BEAUTY"
Anna Goodson
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 9:00 AM-9:15 AM
Mentor(s): Marcie Ray (Music)

Musicologist Susan McClary, as well as literary scholars Kathryn Van Spanckeren and Jon McKenzie, have examined Laurie Anderson's androgyny within the context of her influential career as an electronic musician as well as her role as a performance artist. Despite such interest in the interaction between her gender and her music, researchers have paid little attention to the commercial interests that shaped the album artwork on Talk Normal, in which Warner Brothers recast Anderson's androgyny into something distinctly more feminine. I argue that Talk Normal's cover artwork undermines Anderson's own expression of her gender, and claim that Warner Brothers felt uncomfortable marketing Anderson's gender-defiant persona. This presentation analyzes her single "O Superman" to explore the connection between her identity and her music, and how the album's cover artwork, in contrast, attempts to situate her music. By closely examining the resistance to Anderson's decision to express herself as gender-neutral, this paper sheds light on the way in which a female musician's art often is informed by the commercial (as well as social and cultural) pressures to perform normative femininity.

AUSTEN AND AMORALISM: TRACING LADY SUSAN'S MORAL PSYCHOLOGY
Jessa Stegall
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 9:15 AM-9:30 AM
Mentor(s): Jamie Nelson (Philosophy)

As philosophers tend to understand the term, moral psychology explores the assumptions about human motivation, cognition, and affect that are implicit in various accounts of moral reasoning and responsiveness, and as well considers the normative dimensions offered by various accounts of the so-called "moral emotions"—e.g, resentment, love, or envy. In such explorations, information about human psychology—what people are actually like, how complexly structured are their motivations and emotions—is required, and is derived from several sources, such as empirical studies, personal experience, and realistic fiction. My research focuses on Jane Austen's Lady Susan, an early epistolary novella. Lady Susan is thoroughly unlike Austen's better-known heroines. She is—or seems—a thorough-going amoralist, which is to say, a person whose engagement with morality is wholly strategic. Norms of morality for her are simply tools to be used only if they are conducive to achieving her own ends, and to be dismissed otherwise. Lady Susan provides an opportunity to explore the "moral psychology" of an amoralist.Drawing from discussions of amoralist moral psychology in the literature of feminist ethics, of mainstream moral philosophy, of empirical psychology, and literary criticism focused on Lady Susan, my presentation aims to provide a new perspective on how to understand this text. Criticizing views that portray Lady Susan as a rational, proto-feminist agent operating strategically in a highly oppressive situation, I show that contemporary studies in abnormal psychology reveal Lady Susan's thoughts and actions to be indicative of psychopathy.

"THERAPY THROUGH THE AGES: HOW ANCIENT PHILOSOPHY RELATES WITH CONTEMPORARY PSYCHOLOGY"
Micah Zylstra
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room

Time: 9:30 AM-9:45 AM
Mentor(s): Benjamin Pollock (Religious Studies)

My research will explore the therapeutic character of religious and philosophical quests for enlightenment. As scholars like Hadot, Nussbaum have shown, Hellenistic philosophers often understood philosophy itself not as a narrow intellectual pursuit, but rather as a disciplined way of life aimed at overcoming ,or at least grappling with, the felt limitations of human existence. In addition, early Christian thinkers presented religious life as sharing this same therapeutic quality. In order to grasp the broad spectrum of thought, this work will examine ideas from Platonist, Aristotelian, Stoic, Epicurean, and Skeptic philosophy, as well from Christian thinkers like Augustine and Boethius. Each philosophical school understood an innate deficiency that existed within the human experience. What did each group acknowledge as suffering, and how did their therapies resemble or differ from one another? This work will study the character and purpose of such therapy in ancient religious and philosophical texts. I will then compare such ancient therapies to important modern conceptions of the therapeutic process (e.g., the Freudian), and will consider contemporary attempts, such as those of Lear, to understand the philosophical significance of therapy. What does the common contemporary view of therapy as a psychological coping mechanism share with those ancient views of therapy as having ethical and religious import? Do other examples of modern day psychological phenomena (i.e. positive psychology) relate to these ancient philosophical ideals? How are we to account for the differences between ancient and modern views of therapy? Finally, where is the practicality in exploring this conversation?

READING, ATTENTION, AND THE HISTORY OF MIND: LEARNING AND FEMALE EDUCATION IN JANE AUSTEN
Savannah Smith
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 9:45 AM-10:00 AM
Mentor(s): Natalie Phillips (English)

Jane Austen's works have received notoriety throughout the years, not only for their charming romantic plotlines, but also their satiric societal critiques. Education often comes into play in Austen's novels in relation to her characters at the intersections of class, age, and gender. In a modern age in which many contradicting educational practices and paradigms of teaching exist, it is important to see how past practices and beliefs inform those we choose to enact today. Examining Austen's novels, such as *Mansfield Park*, using literary analysis can illuminate some of the common eighteenth and nineteenth-century theories of education. My presentation focuses on this literary analysis and incorporates research from online archives such as the *Metaphors of Mind* database, the *Eighteenth Century Collections Online Database*, and the *Reading Experiences Database* in order to investigate first-hand accounts of education theory and theories of memory, attention, and reading from this time period. Similar to the discourse surrounding modern-day education, Austen's era was one of many competing arguments for education. My findings will show that during eighteenth and nineteenth-century, there was a tension between allowing students to be seen as individuals and desiring students to conform to an idea. My work, grounded in detailed literary analysis and supplemented by research in history of mind and education, offers an extensive look into some of the ideologies that can shed light on how educational discourses have evolved into those we participate in today in order to see what progress is yet to be made.

CONSTRUCTING AND SUSTAINING A NEW MUSIC GENRE: A STUDY OF THE MUDDY ROOTS-FARMAGEDDON MUSIC SCENE
Morgan Elizabeth Torre
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 10:00 AM-10:15 AM
Mentor(s): Christopher Scales (Residential College in the Arts and Humanities)

In this project I examine the Muddy Roots-Farmageddon (MRF) music scene, a relatively new musical community that has emerged over the past five years, in order to gain insight into how new music genres are formed, solidified, and sustained. The central research questions addressed in this study include: how the music scene's genre was created and how it is supported. Focusing on the community's festival activities, I examine the importance of festivals in facilitating this new music genre and its scene. Looking to the activities conducted in-between festivals (e.g., the use of social media), I also evaluate the sustainability of the scene. This project has involved two years of ethnomusicological field work, including ethnographic interviews, online data crawling, and first-hand experience as a participant-observer at the festivals. My presentation will exhibit the results of my data collection in an abbreviate form of a much larger ethnomusicological research paper. Academic research concerning festivals and new and emerging music genres is scarce. Three particular concerns are: the inconsistency of theory and terminology in the study of festivals, the lack of research about social media as virtual field sites, and the shortage of studies about new music genres in the field of ethnomusicology. Therefore, the presentation of this musical community will help to fill an academic void by analyzing the way in which festivals and other activities within a musical community construct and sustain a new music genre.

MANAGING RESEARCH PRAXIS: THE STORY OF A COLLABORATIVE SPACE IN THE MSU LIBRARY
Meghan Richardson

Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 10:15 AM-10:30 AM
Mentor(s): Ben Lauren (Writing, Rhetoric, and American Cultures)

To effectively collaborate, people at Michigan State University need environments that meet both physical and technological exigencies. The main MSU library is ideally suited to support collaborative environments because of its central location and mission of providing MSU students with access to resources that serve their educational needs. This research presentation discusses how a collaborative room in the library was designed as part of a student project in a course on managing experience architecture projects. The presentation has two main parts. The first part describes how a team of students worked with library stakeholders to research and propose a plan for a collaborative space design and how project management activities can be used to organize such work. Additionally, it details the research process itself by explaining how the student team used qualitative methods such as participant observation, interviews, and head counts to research collaborative activities in different spaces and places in the library. The second part of the presentation explains how the team used project management techniques such as scoping, scheduling, budgeting, assessing risk, and managing stakeholder interactions as a means to organize and think through the project. This part of the presentation will also discuss how the team documented the tensions that surfaced in working to understand and empathize with users while noting how project management techniques can be used to optimize and reflect on research praxis.

INTERNATIONAL PARTNERSHIP AND PROGRAM DEVELOPMENT: A SUMMIT IN COSTA RICA
Elizabeth Cooper, Erik Krueger
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 10:30 AM-10:45 AM
Mentor(s): Vincent Delgado (Residential College in the Arts and Humanities), Scot Yoder (Residential College in the Arts and Humanities)

The conversation about civic engagement – specifically in international study abroad programs – is constantly evolving and incorporating new, innovative best practices. In the summer of 2013 we traveled to Costa Rica with the Ethics in Tourism and Sustainable Development program lead by Vincent Delgado and Scot Yoder. After an impactful experience, we wanted to extend our work with the Costa Rican community partners by collaborating with them in the continued development of our program and partnerships. In the fall of 2014, we organized and participated in a summit with sixteen Costa Rican partners and eight MSU faculty members. During the Summit, we addressed many questions regarding the constraints of engaging in an international setting, including: how can we continue to grow our partnerships with each other? How can we better integrate the RCAH's goals with the goals of those we are working with? Through a weekend of insightful conversations, we discovered a need for a less university-centric program structure. In contrast to students prescribing development projects to the communities, this new model creates a corridor for communities to utilize their place-based knowledge to design projects students will have the opportunity to engage with. A new set of principles was created to combat the limitations that accompany programs spearheaded solely by universities, with the hope that community residents and leaders will transform into the onsite program leaders. By integrating these principles the intended outcome is a co-generative engagement that enriches the impact on all stakeholders.

LIKE A PHOENIX: SOCIETY'S DEMISE AND REBIRTH, AN ANALYSIS OF FAHRENHEIT 451
Emma Theis
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room
Time: 10:45 AM-11:00 AM
Mentor(s): Theresa Winge (Art, Art History, and Desgin)

I draw inspiration from Ray Bradbury's Fahrenheit 451(1953). Set in a future dystopia, the novel deals with the outlawing of all books and the firemen that burn down houses where books are found. Near the end of the novel, protagonist and now outlaw Guy Montag joins a group of fugitives who memorize literature in order to preserve it until society accepts books once again. One of the outlaws, Granger, compares the phoenix to man, stating that man is in a cycle in which he keeps destroying himself and must rebuild society out of the brokenness he created. My design focuses specifically on Granger's comparison between the dystopia of Fahrenheit 451 and the phoenix and the process both go through. For this presentation, I will utilize video and live action to visually communicate the key concepts drawn from the book, Fahrenheit 451. Using the video and live action, I will also be demonstrating the procedure and outcome of 3D printing. My video will show the design process from concept and point of view, through sketching, modeling, and printing on a 3D printer. My live action will consist of a person modeling my 3D printed design for audience members.

ORAL PRESENTATIONS, SECTION 2
LAKE SUPERIOR ROOM, 1:00-2:45 PM

GAY FROM GAYLORD
Andrea Raby, Danielle Dillon, Christopher Ryan
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 1:00 PM-1:15 PM
Mentor(s): Bob Albers (Media and Information), Geri Zeldes (Journalism)

'Gay from Gaylord' is the story of 19-year-old Chris Ryan, a student at Michigan State University that grew up in the rural town of Gaylord, MI. During his high school years, Chris came out as gay. Chris is also a stand up comedian, which was a major way that he was able to find his voice as a part of the LGBTQIA community. This documentary interweaves Chris's stand up routine while recounting of his childhood and what it was like to come out in this white, conservative Christian town in northern Michigan.

APPAREL AND TEXTILE DESIGN
Niki Sullivan
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 1:15 PM-1:30 PM
Mentor(s): Theresa Winge (Art, Art History, and Design)

I conducted research that explores the spatial relationships created when fabric is constructed around the body into conceptual garments. Utilizing pattern drafting and draping techniques for apparel design, I have developed an innovative and sustainable design methodology. Currently, I am examining the ways zero waste (i.e., pattern pieces fit together similar to a jigsaw puzzle to minimize waste) and transformational reconstruction (i.e., process of moving fitting seams and darts into style lines) offer new knowledge for space and structure, especially the potential for extensions and innovations beyond the body's traditional silhouette in fashion design. In this presentation, I focus on sharing research about sustainable fashion design techniques that innovatively approaches and extends the human form. Using non-woven fabrics, the limitations of classic tailoring are lifted and give more freedom to manipulate seam allowances and excess fabric into non-traditional silhouettes. As geometric shapes dictate the pattern pieces, new and modern solutions to wrap the body are born.

NUESTROS CUENTOS CIVIC ENGAGEMENT PROGRAM
Daniel Finegan
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 1:30 PM-1:45 PM
Mentor(s): Estrella Torrez (Residential College in the Arts and Humanities)

Nuestros Cuentos has been a collaboration project between the Residential College in the Arts and Humanities, The College Assistance Migrant Program, Mt. Hope Elementary School, and Pattengill Middle School. Student Collaboration is the venue for providing spaces for mutual and shared exploration of literacy, community engagement, Latino and Native American persistence, and narrative studies. Through the process of compiling stories from Lansing Latino and Native American students in a published book, participants come to view themselves as members of multiple communities, communicate effectively across multiple modes and languages, and structure a collaborative investigative process. With three volumes completed, the Nuestros Cuentos collaboration is expanding with increased numbers of students each year. The Residential College in the Arts and Humanities has the motto for applying the humanities for the greater good. Nuestros Cuentos has given a voice to students in our communities through story-sharing, self-reflection, and place-making. Both MSU and Lansing School District students grapple with their own power and privilege (or lack thereof), while participating in the humanizing experience inherent in these transformational dialogues.

BODY PUZZLES: A POST-STRUCTURALIST EXPLORATION IN PERFORMATIVE GENDERED IDENTITY
Sean Smith
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 1:45 PM-2:00 PM
Mentor(s): Theresa Winge (Art, Art History and Design)

In Western society, topics of gender, sex, and sexuality have traditionally been understood as fixed and immovable. As research and time progress, these once constant notions need to be addressed and redefined. With Gender Trouble: Feminism and the Subversion of Identity, Butler (1990) introduces the term "gender performativity" as a counter to gender/sex distinctions. When we start to understand the non-binary, spectral structure of sex, approaches to gender and sexuality quickly seek reevaluation. Conceptualizing a changing future and creating new terms and definitions can allow space for change, but a tangible work regarding human interaction is needed. My thesis addresses the notions surrounding and pertaining to "roles" of gender, sex, and sexuality in the context of control and problem solving through physical scenarios. I used 3D printing technology to create sets of body puzzles, which reflect traditional sex and gender delineations, but update these notions into more abstracted,

contemporary forms. In the performance, the puzzle pieces are strategically attached to human bodies to create a series of individual and changing performances that seek to redefine understandings of gender. Within every iteration of the performance, two participants interact with one another by navigating, and ultimately attempting to solve puzzles, while overcoming potentially uncomfortable and intimate scenarios.

THE NEUROAESTHETICS OF POETRY: A STUDY OF AESTHETIC PLEASURE AND ATTENTION IN READING SONNETS
Lana Grasser, Thilani Jayakody
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 2:00 PM-2:15 PM
Mentor(s): Natalie Phillips (English)

Throughout history, poetry has been a powerful art form expressing the human condition. From epic tales such as the Odyssey to slam poetry performed in smoky bars, poetry has been able to evoke a full spectrum of emotions. Now, as part of an international collaboration with NYU on the aesthetic pleasure of art, music and literature, the Digital Humanities and Literary Cognition Lab at MSU is building on its current innovative research on natural reading to examine literature, in particular sonnets. This study will test not only the aesthetic pleasure of poetry, but also attention and the effects of rhyme and meter in reading poetry. Our study of aesthetic pleasure uses elements from a German study of four line stanzas (Kotz., et. al.) to break down perceived and felt emotion whilst reading a sonnet, as well as the intensity and, finally, the overall aesthetic pleasure. With the usage of the Coh-Metrix database, we can map patterns of aesthetic pleasure onto lexical elements of sonnets, including readability, familiarity, and concreteness, as well as their thematic content and meaning to the individual reader. Our study of attention modifies the rhyme and meter of Elizabethan and Petrarchan sonnets using synonyms and inversions to alter end words. Presentation of altered sonnet will enable examination of stylistic elements of sonnets and their influence on aesthetic pleasure and attention. Mapping the neural networks of aesthetic pleasure and the influence of literary elements on attention and enjoyment, we continue to push forward in pioneering research of reading.

GOLDEN LAND: THE TRANSFORMING IDENTITIES OF FEMALE JEWISH IMMIGRANTS AND LABOR ACTIVISTS
Jenny Crakes
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 2:15 PM-2:30 PM
Mentor(s): Eric Aronoff (Residential College in the Arts and Humanities), Anita Skeen (Residential College in the Arts and Humanities)

Tying together primary historical research with an original stage play script, my research examines the transforming identities of Jewish immigrant women in early 20th century America, with a particular focus on the garment workers' strike in New York City during winter 1909-1910, often called the "Uprising of the 20,000." Specifically, I explore the ways in which traditional Jewish culture, ethnic violence and the immigrant experience shaped the identities of female garment workers, and empowered them as labor activists. I position the strike within the framework of two other significant events: the wave of anti-Jewish pogroms in the Russian Empire from 1903-1906, and the Triangle Shirtwaist Factory fire in New York City on March 25, 1911. Concerning the play, my question was: how could these historical themes be portrayed in a script that is entertaining, compelling, and accessible? In my script, I follow three Jewish immigrant sisters through these events, bringing to life the conflicts within and outside their family that entwine with the process of becoming "American." My research is significant because it takes into account many complexities and changes in Jewish female identities, and has strong parallels to the experiences of exploited workers today. In this presentation, I will describe some of the most interesting historical sources I examined, and the new insights they reveal about the transforming identities of female Jewish labor organizers during the strike. I will also discuss the creative process of writing my stage play script and co-directing its production.

IMPROVING THE AUDIENCE-PERFORMER RELATIONSHIP THROUGH VERBAL INTERACTION
Simon Tessmer
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room
Time: 2:30 PM-2:45 PM
Mentor(s): Alison Dobbins (Theatre)

This research aims to increase and improve the connection between the audience and the performer. By articulating more precisely what audiences respond to in performance, the experience of the consumer/participator becomes more sublime and impactful. By directly connecting the performers and the audience through words, more conclusive statements about the activity can be drawn, and a potentially richer and more fulfilling experience can be had by the spectator. Set against the backdrop of recent technological advances, this research allows audience members to control dancers via mobile devices. Select audience members can choose a verb or adjective from a cluster of five, relay it to our dancers, and enjoy the dancers' physical interpretation prompted by the word. The prediction is that audiences will respond better to the dancers' interpretation of individual words based on four criteria. First, the word is humorous or silly. Second, the word is inherently visual by nature, or lends itself well to a visual interpretation. Third, the word's performance won't play out exactly as the audience predicts; the

word sufficiently lacks cultural baggage. Finally, the words work together within their cluster to generate alternating energy levels (high-medium-low); some in the cluster are exciting, while others are contrastingly subtle and low-key. During performances, observations will be made about the audience's engagement (attention, posture, excitement, and willingness to participate) to be measured against which words are being performed, brief demographic information (population size, age, and gender), and a quick post-performance survey.

POSTER PRESENTATIONS, SECTION 1
THIRD FLOOR HALLWAY, 9:00-11:00 AM

EFFECTS OF ROOM ACOUSTICS ON SINGERS WITH DIFFERENT LEVELS OF VOCAL TRAINING
Changseop Lee
Category: Humanities and Performing Arts, Section 1
Poster: 296
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Pasquale Bottalico (Communicative Sciences and Disorders), Simone Graetzer (Communicative Sciences and Disorders), Eric Hunter (Communicative Sciences and Disorders)

Professional singers must be able to adapt to unfamiliar acoustic environments. In this experiment, we are interested in the accommodations singers make in response to different acoustic environments and whether skill level (contingent on experience and degree of vocal training) can be indicative of a distinctive set of accommodations and vice versa. Participants sing arpeggios with varying speeds (tempo) and articulations (legato and staccato). The Lombard effect will then be evaluated at 3 increasing levels of "The Star Spangled Banner" accompaniment. The accompaniment will be delivered in three conditions: via headphones, through loudspeakers in both the presence and absence of reflective panels in a soundproof room. It is predicted that professional (compared to beginner) singers will be more adept at accommodating to changing acoustic environments.

ASSISTANT SET DESIGN STAGE REPERTORY THEATRE
Melissa Hunter
Category: Humanities and Performing Arts, Section 1
Poster: 297
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Kirk Domer (Theatre)

Assisted Kirk Domer in the set design of Search for Signs of Intelligent Life in the Universe as well as Character Man for the Stages Repertory Theatre in Houston, Texas. Took over the designs in Tech and Dress rehearsals when Kirk Domer returned to Michigan. Was in charge of carrying out notes and making sure the set was finished.

XERXES PAINT DESIGN
Savannah McComb
Category: Humanities and Performing Arts, Section 1
Poster: 298
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Kirk Domer (Theatre)

Assisted Kirk Domer, Associate Professor of Scene Design and Department Chair of MSU's Department of Theatre, in painting Xerxes (the opera hosted by MSU's College of Music). While working with Mr. Domer the majority of my research involved learning and mastering several techniques of painting to replicate the looks of granite and marble with water colors. The techniques learnt were: blending colors, feather styling, highlights, shadows, and watercolors.

THE UNSPOKEN DEBT
Calvon Sheridan
Category: Humanities and Performing Arts, Section 1
Poster: 299
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Tamara Butler (African American and African Studies)

For my research I decided to examine critical race theory, the educational debt, and an opportunity gap that is embedded in US society and everyday life. Scholars believe "critical race theory" is reached through the act of storytelling and application of theory to make social change. Hip hop is a forum in which artist express themes of crime, poverty, systematic oppression, and racial injustice. The parallel of the two is through the forum of storytelling not only can we understand others experiences but

we can use these stories as pieces to a bigger puzzle and start to make social change. I plan to address the question how can hip hop serve as a forum to address an educational debt and opportunity gap in America? In regards to the critical race theory the "voice" component of "Critical Race Theory" provides a way to communicate the experience and realities of the oppressed. Which serves as a first step to beginning process of judicial redress. So if rappers tell narratives expressing all the themes listed above, should we not see rappers as educators addressing the educational debt and opportunity gaps embedded in American society? How does music serve as a link between the communities being researched and the scholars conducting the research? What relevance does addressing the social educational debt in hip hop music present? Through this research project I seek to answer the questions presented to think about hip hop as activism and a forum for social change.

HARRY POTTER, FANDOM CULTURE, AND PARTICIPATORY MEMORY
Emily Dallaire, Kelly Turner
Category: Humanities and Performing Arts, Section 1
Poster: 300
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Liza Potts (Writing, Rhetoric and American Cultures)

The Harry Potter Participatory Memory research project mainly focuses on how fans interact, share, and celebrate Harry Potter in both physical and digital spaces long after the canon material has been published. While it has been almost five years since the release of the last Harry Potter movie and just over seven years since the release of the final book, the Harry Potter fandom is still very much alive and prevalent in popular culture and media, continuing to share their experiences, explore and analyze canon material and form new opinions and beliefs. As a research team, we explored, analyzed and evaluated digital and physical spaces sacred in the HP fandom to see how they participate, empower, interpret, and interact across platforms, consume media, and share things with other fans. We will be presenting the trends in participation between physical and digital spaces as well as the variety of content, communities, and experiences offered in both types of spaces to represent the social user experience that fans create in collaboration in these spaces.

FOLLOW YOUR HEART: AN EXPLORATION OF 3D PRINTING TO CREATE A HUMAN HEART ACCESSORY
Brittany Lopez
Category: Humanities and Performing Arts, Section 1
Poster: 301
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Theresa Winge (Art, Art History and Design)

The human heart has both metaphorical and biological significance in human existence. It is thought to be the center of the human being. I draw my inspiration from the importance and structure of heart's arteries and veins, as well as it symbolic representations. As a fashion designer, I find innovative ways to incorporate contemporary technology into my designs. Currently, I am investigating the role that 3D printing has for the creation of not only accessories but garments as well. In order to create a 3D print, the designer uses modeling software to make a digital design; the digital file is sent to the 3D printer to be constructed layer by layer on a hot printing bed with heated resins, metals, or other materials. For this presentation, I examine the structure of the human heart and how the blood flows through to the body. This examination takes shape as a 3D printed fashion accessory that abstractly represents the human heart. I primarily focused on the arteries and veins when designing my fashion accessory. I use modeling software to create a model of my accessory, which is printed in front of an audience.

AN ANALYSIS OF "CULT CLASSICS" IN BLACK CINEMA
Danan Thomas
Category: Humanities and Performing Arts, Section 1
Poster: 302
Location: Third Floor Hallway
Time: 9:00 AM-11:00 AM
Mentor(s): Tamara Butler (English), Megan Charley (English), Kristin Rowe (African American and African Studies)

"Cult Classics" are defined as something that is popular or fashionable amongst a particular group or section of society. There have been many different films, literature, and people who have carved out their own forms cultures within the art. In the realm of film "cult-classics", these films have produced their own viewership interactions, viewer etiquette, and viewer norms. These films have spoken to many unique subsections and the fringes of mainstream society. But, when one speaks on the subject of "Cult Classics" they usually leave out films and media with people of color. Altogether, we tend to overlook the fringes of the fringes of society. Through analyzing many interviews, critiques and films throughout certain intersections of African American cinema history, I would like for my research to analyze what is a "Cult Classic", different subcultures with the African American community , and to find a new definition for Black Film. This study will illustrate the multiplicities within Black Culture and film alike, further acknowledging the need to define "Cult Classics" within Black Cinema.

POSTER PRESENTATIONS, SECTION 2

LAKE HURON ROOM, 1:00-3:00 PM

CAROLE MASO'S AVA: PRACTICE IN READING
Halli Beauprey
Category: Humanities and Performing Arts, Section 2
Poster: 305
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Robin Silbergleid (English)

Working with Dr. Silbergleid, and reading through her manuscript Reading Maso motivated me to also explore some of Maso's work - particularly the novel AVA, which maintains a most nontraditional narrative structure. (It is composed entirely in fragments and is largely plot-less.) AVA challenged me to utilize different comprehension and analytical methods my formal education has previously accustomed me to. While I maintain that this is a project of literary criticism, it does not take a traditional essay form, but rather works in several interconnected fragmental analyses in order to better serve the body of work that it is in communication with. The unique approach to this project is first and foremost informed by Dr. Silbergleid's coinciding work in progress, described as a book of essays about her readings of Maso's work that "perform the anti-narrative strategies of her books themselves." My project expands my experience of reading AVA and applies it to an interpretation of the practice of reading as a whole. My project provides textual analysis, but also asks bigger questions about how the identity of the reader shapes reading experience just as much, if not more, than the actual text does. My project posits the importance of individual readers forming their own "canons," as well as the validity of reader response in critical analysis.In terms of presentation, I plan on an artistic representation of my ideas, which will serve to augment the non-linearity of my analysis while also being accessible and appealing to those attending UURAF.

THEATRE ENGINE: TECHNOLOGY AND AUDIENCE PARTICIPATION IN THE PERFORMING ARTS
Emily Blaquiere
Category: Humanities and Performing Arts, Section 2
Poster: 306
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Alison Dobbins (Theatre)

This project explores the effects of audience participation in performing arts, and specifically focuses on the integration of mobile devices such as smartphones and tablets into live theatrical performances. Theatre Engine is a multi-site collaboration between Michigan State University, Brigham Young University, Kent State University and St. Olaf College. Theatre Engine consists of three phases: "Dancer Toss," "Flashmob," and "Puzzle." My research focuses on the second phase of the project, "Flashmob" which begins as an adjective game and ends with full audience participation in a dance party. As the stage manager my research is drawn form my observations and collected data from all four "Flashmob" performances.

OVERHAULING AN ELEMENTARY SCHOOL WEBSITE: PARTICIPATORY DESIGN IN EDUCATIONAL CONTEXTS
Meghan RichardsonIan Clark, Olivia Hacker
Category: Humanities and Performing Arts, Section 2
Poster: 307
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Ben Lauren (Writing, Rhetoric, and American Cultures)

Experience architects often use participatory design as a method to engage stakeholders throughout the development of a service or product. This poster presentation details how participatory design methods were used to engage stakeholders of a local Pre-K - 6th grade school and evaluate how they engaged in a website redesign project. Additionally, the poster explains our evaluation of how participatory design methods encouraged and discouraged engagement from school stakeholders, and ultimately, comments on the use of such methods in educational environments. Our poster discusses the research process from start to finish, noting the results of interviews, surveys, and focus groups. Additionally, the poster establishes timelines, assembles stakeholder artifacts, and discusses project deliverables. The poster also details how we collected data and analyzed it with key stakeholders of the school to help guide the redesign of the site. Finally, the poster provides a before and after look at the website's design, noting how the design changed throughout the research process.

USING LIGHTS TO IMPACT AN AUDIENCE
Kiah Manthei
Category: Humanities and Performing Arts, Section 2
Poster: 308
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM

Mentor(s): Alison Dobbins (Theatre)

The focus of Theater Engine is to engage the audience in an interactive performance. We are using "Lights On, Lights Off" to bring the elements of surprise and humor to the audience and to give them control of the performance. I wanted to explore how far the audience would go to engage with the performers and to see how their control would affect their engagement. I did extensive research on different types of humor to find what was most appealing to audiences and why. Next, I video chatted into dance rehearsals with performers from both Brigham Young University and St. Olaf College. By taking notes of these rehearsals and observing the dancers' use with the lights I was able to make a prediction of how the audience would act in a performance situation. I believe the audience will learn that their control of the lights consequently controls the dancers on stage. They will then use their control to create a story through these dancers. Through their control they will essentially create the performance that they are watching, furthering their engagement in the production. Trying to engage an audience is unpredictable, but I am hoping that through "Lights On, Lights Off" the audiences get a unique sense of inclusion and will want to perform alongside the dancers, achieving the goal of Theater Engine.

OUR VOICES MATTER
Madeleine Gorman
Category: Humanities and Performing Arts, Section 2
Poster: 309
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Vincent Delgado (Residential College in the Arts and Humanities)

After people approach the Financial Empowerment Center for guidance, their financial troubles are often all that other people see. However, financial problems are sometimes merely a symptom of greater life dilemmas that are not addressed with the same urgency as financial problems. Our Voices Matter is a collection of poetry, written by those who have or are currently receiving help from the Financial Empowerment Center and students from the Residential College in the Arts and Humanities (RCAH). The book allows each person to express their story, creating an outlet for the community partners as well as the students working with them to communicate difficulties each individual tackles every day. Attacking a singular problem that faces a community, such as financial troubles, only cures a symptom of a larger community wide crisis. In this presentation, I will show that producing stories creates an opportunity to explore the greater issues facing the local community in order to empower individuals in every aspect in their lives.

MID AMERICAN THEATRE CONFERENCE NEW WORK SYMPOSIUM EXPERIENCE
Ellie Seelye
Category: Humanities and Performing Arts, Section 2
Poster: 311
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Daniel Smith (Theatre)

As a person new to the world of playwriting, I have been fortunate enough to have had a work been accepted to the Mid-American Theatre Conference. The play, entitled Peasant Study shows what Van Gogh's "Self Portrait with Straw Hat" sees in its day to day life. As a part of the conference and the playwriting symposium, I will witness what it is like to watch a script transform from page to stage in a workshop setting all while collaborating with other artists from other universities in the Midwest. I will be presenting on the collaborative process as well as the experience of transformation from the eyes of someone receiving this unique opportunity.

INTEGRATIVE & ORGANISMAL BIOLOGY

ORAL PRESENTATIONS, SECTION 1
LAKE MICHIGAN ROOM, 11:00 AM – 12:30 PM

RUN OR HIDE: HOW DO LARVAL SEA LAMPREY RESPOND TO THE ODOR OF DEAD ADULTS?
Katie Kierczynski
Category: Integrative and Organismal Biology, Section 1
Location: Lake Michigan Room
Time: 11:00 AM-11:15 AM
Mentor(s): C Michael Wagner (Fisheries and Wildlife)

Aquatic animals frequently use olfaction to gather information related to risks and opportunities from their surroundings. For example, odors from injured or dead conspecifics (alarm cues) alert others to predator attacks and trigger anti-predator responses. The nature of the response (confront, flee or hide) can vary with life-history stage. Free-living adult sea lampreys (Petromyzon marinus) flee the alarm cue emitted by dead adults or larvae. Should larvae, who live buried in sediments, respond

by fleeing as well? We assessed the response of sea lamprey larvae exposed to dead adult odor in a lab experiment using small stream mesocosms. We measured the drift rate of larvae as an indicator of odor detection as the larvae were exposed to one of three treatments: a control (water), 15-minute pulsed odor (pulsed four times over a 12-hour period), and a 12-hour continuous odor. On average, larvae drifted 61% (SE=2) of the time. Larvae drifted more when exposed to the pulsed treatment than when exposed to the continuous treatment. There was no significant difference between the response to control and the response to odor, but a significant interaction between discharge and odor treatment was observed. When odor was absent, more larvae drifted downstream as discharge increased. We observed the opposite pattern when odor was present, with fewer larvae drifting downstream as discharge increased. We hypothesize the reduced drift rate in the presence of the odor was associated with larvae sensing the greater risk and hiding in their burrows.

TEMPERATURE AND NUTRIENTS STABILIZATION OF AQUATIC LIFE IN A 600ML BEAKER SETTING
George Hyde
Category: Integrative and Organismal Biology, Section 1
Location: Lake Michigan Room
Time: 11:15 AM-11:30 AM
Mentor(s): Douglas Luckie (Lyman Briggs College)

Human actions can greatly affect aquatic ecosystems. The major man-made problems are global warming and fertilizer runoff. We tested three hypotheses studying the effects of increased water temperature, increased fertilizer, and increased water temperature and fertilizer on closed beaker aquatic ecosystems. Ten 600mL beakers were filled with 400mL of deionized water. Then 0.21g of fertilizer was added to four of the ten beakers, while 0.42g of fertilizer was added to another four beakers—thus leaving two beakers with no fertilizer. To each beaker 27mL of algae was added. Seven days later two Daphnia were added to all ten beakers. Our study found that Daphnia movement decreased with increasing water temperature (mean: 0cm2±0cm2 compared to mean: 4.3cm2±2.97cm2) and fertilizer (mean: 1.2cm2±1.70cm2 compared to 4.3cm2±2.97cm2). This data shows that there is some correlation with water temperature, fertilizer concentration, and aquatic life. However, more studies should be performed in the future to gain more information about this topic.

EFFECTS OF ANTHROPOGENIC DISTURBANCES ON SPACE-USE IN SPOTTED HYENAS
Mary Kearney, John Kochiss, Morgan Lucot, Ellen McGowan
Category: Integrative and Organismal Biology, Section 1
Location: Lake Michigan Room
Time: 11:30 AM-11:45 AM
Mentor(s): David Green (Zoology), Kay Holekamp (Zoology)

Global human population growth is a threat to the existence of large carnivores. As the human population expands, many large carnivores are subject to habitat loss or degradation, depletion of their prey, and conflicts with people. Therefore, it is imperative to understand how large carnivores are adapting to these ecological changes and anthropogenic threats. Changing space-use patterns may reflect current ecological conditions more immediately than other metrics. The Maasai Mara National Reserve in southwestern Kenya is an ideal study site due to its high carnivore densities in proximity to human settlements. In the current research, we are studying space-use patterns in three spotted hyena (Crocuta crocuta) clans that primarily reside either within the Reserve or along its boundaries. Using hourly coordinates collected from 20 GPS-radio collars deployed on adult hyenas among the three clans, we will analyze their space-use using the R package T-LoCoH. We will determine how their movements vary within their territory boundaries in relation to both ecological and anthropogenic factors. The results of this study will be influential in understanding how large carnivores may be adapting to the urbanization of landscapes in east Africa, and also assist in developing conservation strategies to aid in the coexistence between humans and carnivores.

THE ADVERSE EFFECTS ON MACROPHYTES WHEN EXPOSED TO EMULSIFIERS
Morgan Kiryakoza
Category: Integrative and Organismal Biology, Section 1
Location: Lake Michigan Room
Time: 11:45 AM-12:00 PM
Mentor(s): Kendra Cheruvelil (Fisheries and Wildlife)

Emulsifiers, such as detergents, are commonly used to clean up oil spills. We experimentally determined if detergent imposed adverse effects on macrophytes during a cleaning simulation. We used macrophytes because they are a rudimentary source of food and energy for many smaller organisms such as crayfish. We tested the hypothesis that presence of detergent would cause the health of the macrophytes to decline. For our experimental approach we set up four separate aquatic environments with equal amounts of sunlight, substrate, and water. A tank with two replicates and no detergent added served as a control, and three treatment tanks with six replicates were added with 1170 ppm of detergent. We compared the average change in wet mass of the macrophytes of the emulsifier added treatment to the control unit. Our study found that the macrophytes in the emulsifier-treated environment decreased in mean wet mass (mean = -1.7±0.76 gram) while the macrophytes in the control unit increased in mean wet mass (mean = 0.42±0.48 grams). The mean change in wet mass between the control and treatment were significantly different (T-stat = 4.58, p = 0.0196). This research supports the notion that emulsifiers are not an ecologically safe enough cleaning product.

EFFECTS OF ROAD SALT AND TEMPERATURE ELEVATION ON DAPHNIA SP. AND PHYTOPLANKTON
Andrea Hess
Category: Integrative and Organismal Biology, Section 1
Location: Lake Michigan Room
Time: 12:00 PM-12:15 PM
Mentor(s): Douglas Luckie (Lyman Briggs College)

Climate change is predicted to have detrimental effects on freshwater aquatic ecosystems. Locally, road salt pollution and increased water temperature are two environmentally damaging concerns. To observe potential responses of populations to new pressures, we exposed members of the lowest trophic level of an aquatic ecosystem, Daphnia sp. and phytoplankton, to increased salt tension and higher water temperatures. We hypothesized that both populations would be impacted by either change and show the greatest decrease when exposed to both variables due to the inability of their body systems to adapt quickly and function well in these abnormal conditions[1]. The four treatments included: increased salinity, increased temperature, an increase in both variables, and controls in matching systems (n=2). The concentration of salt used was 0.5g/L (a 200% increase)[1] and the temperature increase was approximately 3°C (13% increase). Our pilot study found that when exposed to increased salinity and temperature, there was a significant decrease in the population of zooplankton, but no substantial impact on phytoplankton. These initial findings support a low tolerance, even with a short period of exposure, for Daphnia sp., which suggests they may be more immediately at risk to these variables. However, we predict longer exposures may also identify similar impacts on phytoplankton. Hence, further study is still needed to better clarify the effects of these variables on both populations.

VOCAL ANALYSIS REVEALS CRYPTIC SPECIES IN THE SLENDER-BILLED CROW CORVUS ENCA COMPLEX
Joseph Shemanski
Category: Integrative and Organismal Biology, Section 1
Location: Lake Michigan Room
Time: 12:15 PM-12:30 PM
Mentor(s): Pamela Rasmussen (Zoology)

The Slender-billed Crow *Corvus enca* of south-eastern Asia is currently recognized as having eight subspecies, distributed from Malaysia through eastern Indonesia and the Philippines. However, some of these subspecies have highly distinct vocalizations, but no comparative acoustic study has previously been performed on this group. Major, consistent differences in vocalizations of corvids are usually considered indicative of species status, so I hypothesized that *C. enca* as currently constituted is comprised of more than one species, some of which may be of conservation concern. To test this hypothesis, I analyzed 98 recordings of *C. enca*, 39 of which were of the subspecies *compilator*, 34 *celebensis*, 2 *enca*, 2 *mangoli*, 16 *pusillus*, 3 *sierramadrensis*, 2 *violaceus*, and 535 of other SE Asian corvid taxa for comparison. I used Raven Pro 1.3 to visualize sonagrams of the recordings downloaded from the bird vocalization databases AVoCet and Xeno-Canto, and measured length of notes, number of notes per strophe, the fundamental frequency, harmonics, and within-strophe modulation of amplitude and frequency. Principal Component Analysis (PCA) indicated that *Corvus enca pusillus* (from Palawan) and *Corvus enca sierramadrensis* (from the mountains of Luzon, Philippines) are notably distinct vocally from other subspecies, clustering away from other subspecies without significant overlap. This strongly supports the treatment of *pusillus* and *sierramadrensis* as separate species. In addition, *C. e. celebensis* and *C. e. compilator* have auditory distinctions that do not appear in current statistical analysis, and further analyses will be done to determine if qualitative scoring can discriminate between these subspecies.

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 1:00-3:00 PM

CAFFEINE'S EFFECT ON CHANGES IN BLOOD PRESSURE IN RESPONSE TO POSTURAL TRANSITION
Alexander Kaechele, Nicholas Rykulski
Category: Integrative and Organismal Biology, Section 1
Poster: 314
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Erica Wehrwein (Physiology)

A mixture of caffeine and ergotamine, a potent vasoconstrictor, has already been shown to decrease the symptoms associated with orthostatic hypotension. We hypothesized that an oral dose of 100 mg of caffeine alone was sufficient to see significant differences in the change in systolic blood pressure associated with postural change in healthy subjects. Seven non-regular caffeine users, ages 19 to 22, and consisting of four males and three females, were studied. Subjects were asked to refrain from caffeine use for a period of 24 hours and then received either a 100 mg caffeine pill and 250 ml of water (experimental group) or only 250 ml of water (control). Systolic blood pressure measurements were taken 1 hour after treatment with a digital blood pressure monitor while lying down, sitting, and standing. On a subsequent day, those who received the experimental treatment received the control treatment and vice versa so that paired measurements were taken for each subject. Statistical analysis was

done using a paired t-test. Subjects in the caffeine treated group showed an average increase in systolic blood pressure of 5.43 ± 2.08 mmHg when going from a supine to a standing position while those in the control group exhibited an average decrease in systolic blood pressure of -4.43 ± 1.89 mmHg showing a significant difference between the two groups (p-value<0.05).These results would suggest that low dose caffeine supplementation can help prevent the drop in systolic blood pressure associated with postural transition when compared to non-caffeine treated individuals.

EFFECTS OF HYPERGLYCEMIA ON CAROTID BODY HYPOXIC RESPONSES
Thomas Mayer, Ryan Haag
Category: Integrative and Organismal Biology, Section 1
Poster: 315
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Erica Wehrwein (Physiology)

Carotid body chemoreceptors respond to a variety of metabolic changes in an integrative manner. Given that hyperglycemia can serve as a desensitizer of the carotid bodies, we hypothesized hyperglycemia would blunt the carotid body's ability to increase heart rate, blood pressure, and ventilation in response to hypoxia. Thirteen young healthy subjects (7M, 6F) were studied after fasting for at least three hours. Change in heart rate, blood pressure, and ventilation was measured between normoxic and hypoxic breathing conditions during fasting euglycemia (average blood glucose 89.77±3.44 mg/dL) and again 30 minutes after administration of 75g oral glucose tolerance test to induce hyperglycemia (average blood glucose 149.92±9.72 mg/dL). Statistical analysis was done using paired t-tests. Comparisons were made between fasting and hyperglycemia for each characteristic measured and are reported as the delta change from normoxia to hypoxia: systolic blood pressure (7.23±1.44 vs 1.38±1.73 mmHg, $p<0.05$), mean arterial pressure (5.18±1.04 vs 1.79±1.42 mmHg, $p<0.05$), heart rate (8.24±1.80 vs 3.93±1.59 beats/min, $p<0.05$), and respiration (1.57±0.86 vs 0.02±0.41 breaths/min, $p<0.05$). This data shows that hyperglycemia blunts physiological responses to hypoxia, likely through desensitization of the carotid body. Thus, this study supports the role for the carotid body as an important integrative physiological sensor.

THE ROLE OF REARING ENVIRONMENT ON THE SPATIAL COGNITIVE ABILITY OF TWO SYMPATRIC SPECIES OF THREESPINE STICKLEBACK
Jonatan Martinez, Ben Wurst
Category: Integrative and Organismal Biology, Section 1
Poster: 316
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Janette Boughman (Zoology), Jason Keagy (Zoology)

Comparative analysis of taxa early in the process of speciation could greatly increase our understanding of cognitive evolution. We take advantage of a well characterized adaptive radiation to study spatial cognitive ability in sympatric threespine stickleback fish (Gasterosteus species complex) that have adapted to two distinct ecological niches, the "limnetic" and "benthic". The limnetics occupy the pelagic zone of the lake, a spatially simple environment. The benthics occupy the benthos, a spatially complex environment. Previous studies show that benthic sticklebacks outperform limnetic sticklebacks in spatial cognition learning tasks. However, evolution cannot occur unless variation in a trait has a genetic basis. It is currently unknown if differences in spatial cognitive ability are influenced more highly by genetic differences or rearing environment. To test this idea we reared subjects from both species in spatially simple and spatially complex environments. Fish from each treatment will be tested on spatial cognitive ability with the use of previously validated T-maze test. With this information we can compare and contrast treatments to determine the influence rearing environments have on spatial cognitive abilities. How rearing environment impacts spatial cognition also has implications for fish hatchery practices because spatial cognition is likely important to health and survival in other fish species.

WHAT'S IN A BITE: SKULL ONTOGENY AND DIETARY CHALLENGE
Courtney Hughes, Kecil John, Lauren Macron, Katie Markiewicz, Allie Richardson, Nick VanAcker, Chelsea White
Category: Integrative and Organismal Biology, Section 1
Poster: 317
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Cybil Cavalieri (Zoology), Barbara Lundrigan (Zoology)

Developmental constraints can delay the timing of morphological maturity, which in turn affects an individual's ability to compete with conspecifics. Here we compare ontogeny of the cranium and mandible in 6 species of carnivores, representing a range of dietary preferences. We test the hypothesis that trade-offs exist between dietary challenge (i.e., 'take down' difficulty and food consistency), and the rate and timing of skull development, such that species with more 'difficult'diets reach morphological landmarks (e.g., age at adult skull morphology) later relative to other life-history events. Skulls of each species representing individuals ranging from 1 day to several years of age were photographed and digitized in three views (ventral cranium, lateral cranium, and lateral mandible). Ontogenetic change in skull size (centroid size) and shape (Procrustes distance

from the average for the youngest specimens) were plotted for each species and the ages at maturity compared. To estimate age at maturity for skull size and shape, we used the 95% of the asymptotic (adult) value from nonlinear growth models selected using Aikaike Information Criterion. Interspecific differences in skull ontogeny were interpreted in the context of life history events (e.g., age at first reproduction). Preliminary data suggest a positive relationship between dietary challenge and the timing of skull maturity. Carnivores with 'difficult' diets mature later relative to life history events than do those with less 'difficult' diets.

LION AND HYENA INTERACTION
Sarah MacLachlan
Category: Integrative and Organismal Biology, Section 1
Poster: 318
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Kay Holekamp (Zoology), Kenna Lehmann (Zoology), Tracy Montgomery (Zoology)

Lions and spotted hyenas are apex predators in African ecosystems. Spotted hyenas compete directly with lions for food; during direct interactions hyenas frequently "mob" lions to force them to leave their food. Mobbing behavior requires hyenas to act cooperatively. A "mob" is two or more hyenas acting together to approach and aggress upon one or more lions in an attempt to gain control of a carcass. Mobbing behavior involves great danger for hyenas (Trinkel & Kastberger 2005). In my project I am looking at situations when a hyena or a small group of hyenas stumble upon lions that have food. We have 25 years of archived field notes that will be analyzed. I will determine whether or not the hyena(s) vocalize to attract more hyenas in order to try and steal the food from the lions. We hypothesize that hyenas with lower social rank will not vocalize, because if higher ranking hyenas answer the call, then the lower ranking individual who called would not get to eat. However, if it is a high-ranking hyena who discovers lions with food, they should vocalize because, if food is successfully procured from the lions, high ranking hyenas will be able to eat. Our goal is to characterize cooperation among hyenas during interactions with lions. By understanding mobbing behavior we can better understand both lion and hyena ecology. If we can better understand what drives cooperation in hyenas, we should be able to design robots that cooperate as well.

PARASITES OF WHITE BASS, MORONE CHRYSOPS, FROM LAKE ST. CLAIR, MICHIGAN
Kyle DePlancke, Danielle Brehm-Lowe
Category: Integrative and Organismal Biology, Section 1
Poster: 319
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Patrick Muzzall (Zoology)

White bass, Morone chrysops (Moronidae) are a popular game fish that are economically important to the Great Lakes region. To contribute to the knowledge on the parasites they harbor, over 50 adult white bass were collected by the Michigan Department of Natural Resources from Anchor Bay, Lake St. Clair in April-May, 2014 and frozen after capture. Fish were thawed and examined for parasites using dissecting and compound microscopes. Those found were from the following phyla: Platyhelminthes, Acanthocephala, and Nematoda. Of those parasite found, three species of Platyhelminthes were of particular interest due to the large number of fish they infected. These three species were two adult trematodes: Allacanthochasmus artus and Allacanthochasmus varius (Cryptogonimidae); and one larval cestode: Triaenophorus nodulosus (Triaenophoridae). Allacanthochasmus varius and A. artus were found in the small intestine and large intestine respectively. Triaenophorus nodulosus occurred encysted in the liver, mesentery, ovaries and spleen. Each of these parasites had a prevalence of 85% or higher, and occurred in high numbers. The numbers of individuals of each parasite species were counted and analyzed by fish gender and total length. This study is the first one reporting on the parasites of white bass from Lake St. Clair.

POSTER PRESENTATIONS, SECTION 2
BALLROOM, 1:00-3:00 PM

COMPARING SEX DIFFERENCES IN ANIMAL MODELS OF POST-TRAUMATIC STRESS DISORDER
Rebecca Benjamin
Category: Integrative and Organismal Biology, Section 2
Poster: 322
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Marc Breedlove (Neuroscience), Cynthia Jordan (Neuroscience), Apryl Pooley (Neuroscience)

Post-Traumatic Stress Disorder (PTSD) is an abnormal, prolonged stress response to a traumatic event that affects an estimated 7% of the general population and up to 30% of post-war veterans in America. Debilitating symptoms of PTSD can impede the lives of affected individuals for decades. Women are more than twice as likely to develop PTSD than men; however, the reason for the sex difference in PTSD is not understood, as most of the PTSD literature has traditionally focused on male subjects. A better understanding of the neurobiological mechanisms that underly PTSD is crucial for developing more effective treatments

for both men and women affected by the disorder. Previous research from our lab using rats has shown that there are a number of physiological and behavioral differences between males and females who encounter a traumatic event, as found with our use of a well-validated animal model. My current study aims to test whether the sex differences seen with that model are generalizable. To do so, I am using a different model of PTSD, but the same outcome measures that were used with our first model. I will then compare the sex-dependent trends seen using each model. If the second model yields similar outcomes as were seen using the first model, I will conclude that the sexually dimorphic response to stress is not simply a peculiarity of a single model, and it can be generalized to different forms of traumatic stress.

DOES HUMIC ACID DECREASE VISUAL AND OLFACTION ABILITIES IN THE THREESPINE STICKLEBACK (GASTEROSTEUS ACULEATUS)?
Savannah Foster
Category: Integrative and Organismal Biology, Section 2
Poster: 323
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Jenny Boughman (Zoology)

A number of species are dependent on their visual and olfactory senses to discover food, detect predators, and assess potential mating partners. Chemicals in the organism's environment can affect the perception of these cues. Humic acid is found in many freshwater lakes as a natural and synthetic product. This chemical turns the water a translucent brown color and affects the pH of aquatic environments. The threespine stickleback, Gasterosteus aculeatus, is a fish that relies on vison for many behaviors, and pH is known to affect its olfaction abilities. We hypothesized that the presence of humic acid decreases its visual and olfaction capabilities. Our study sought to determine this by observing how low levels of humic acid affect G. aculeatus' ability to detect and respond to food. We observed the amount of time and how close an individual got to a stimulus jar containing food when she could either only see or smell the stimulus, or was able to both see and smell the food. Fish were tested twice, once in the absence and once with the addition of humic acid. We predict that in trials where humic acid is present the individual will spend less time associating with the food stimulus because humic acid will decrease vision and olfaction abilities. If humic acid is detrimental to G. aculeatus' olfaction and visual abilities, it can decrease their ability to make good mating choices (detrimental to the species) and might inhibit their ability to find food (detrimental to the individual).

THE IMPACT OF "THE IMPACT HYPOTHESIS" ON PEER-REVIEWED RESEARCH OF DINOSAUR EXTINCTION
Travis Bauer
Category: Integrative and Organismal Biology, Section 2
Poster: 324
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Danita Brandt (Geological Sciences)

The Cretaceous-Paleogene extinction event 65 million years ago, of which non-avian dinosaurs were the most notable casualty, captures the imagination of both the scientific community and public. How we understand this extinction event has changed over time, and the changing consensus effects the information disseminated to the public, as well as the method. Many hypothesis regarding dinosaurian extinction have been proposed over the past century by professionals of varying fields, ranging from volcanism and climate change to allergies and disease. However, no hypothesis has had the impact of the Alvarez and Alvarez paper of 1980 which laid out the evidence for meteorite impact as a primary cause, and the subsequent announcement of the Chicxulub Crater discovery in the Yucatan Peninsula of Mexico. In our study we collected bibliographic data from a large sample of published peer reviewed journal articles regarding dinosaur extinction over several decades. Our goal was to conduct a statistical analysis looking for changes, trends, and correlations among published hypothesis, and to note significant discoveries, technologies, and developments that contributed to our understanding of the extinction event. Being able to see a scientific process in this way helps us to communicate to others how a scientific consensus is arrived at, and the discussion that occurs as evidence accumulates.

LISTENING TO WHAT FEMALES HAVE TO SAY: FEMALE SONG CHARACTERISTICS MAY COMMUNICATE INFORMATION TO RIVAL HOUSE WRENS
Alexandra Burnett
Category: Integrative and Organismal Biology, Section 2
Poster: 325
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Cara Krieg (Zoology)

Male bird song is a well-studied sexual signal used to communicate to both females and competing males, while female song has only just come under scientific scrutiny. A Michigan population of House Wrens (Troglodytes aedon) exhibits a variety of female songs that provoke differential aggressive responses from rival females, suggesting that these songs communicate information regarding conflicts. We found that stimuli that received more aggressive responses could be predicted by two song

features, a specific syllable "HI," ($p<0.001$) and acoustic complexity ($p=0.001$). By recording 58 aggression trials and looking at the "HI" syllables given during these trials, we found that more aggressive birds gave significantly more "HI" syllables when presented with a simulated intruder ($p=0.0004$). Because over half of our females used this syllable at least once, we argue that the syllable "HI" is a potential candidate for a conventional signal used in female song. The second predictor of aggressive response, acoustic complexity, appears to have a relationship with physical condition under certain environmental conditions. During non-drought years, females in better condition tended to sing more complex songs, however, during a drought year this trend reversed to show a significant inverse relationship ($p=0.01$). This may indicate a trade-off mediated by a third variable, such as metabolic rate or hormonal status. These results provide exciting clues to unveiling the information conveyed through bird song.

THE EFFECTS OF CAPTIVITY ON THE CARNIVORE SKULL
David Druskins
Category: Integrative and Organismal Biology, Section 2
Poster: 326
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Barbara Lundrigan (Zoology)

The diets and activity levels of captive carnivores vary greatly between captive animals and their wild counterparts. In captivity carnivores are often fed prepared meats and are not given the chance to bring down their own prey. This difference in activity between captive and wild individuals causes the neck and facial muscles to become underdeveloped. Here I look at the effects that these differences in diet and activity have on the skull morphology of six species of carnivores, selected to represent a variety of prey procurement strategies. If differences in morphology between captive and wild carnivores are due to captive individuals not being able to bring down their own prey, then the largest differences in skull morphology should be seen in species that most readily bring down large prey. Skulls were photographed and digitized in three different views (lateral cranium, ventral cranium, and lateral mandible). Only skulls from fully developed individuals were used, defined as the 95% of the asymptote value from nonlinear growth models using Akaike Information Criterion. The skulls were then evaluated for differences in shape between captive and wild individuals using Hoetellings T^2-test and Goodalls F-test, then visualized using graphical software. This research hopes to shine light on when, if ever, it is appropriate to substitute captive specimens with wild ones in morphological studies and to help develop better husbandry practices for captive carnivores.

KINESIOLOGY

ORAL PRESENTATIONS, SECTION 1
MSU ROOM, 11:00 AM – 12:30 PM

SIMULATING MOVEMENT DEFICITS IN STROKE: EXAMINING HOW THE BRAIN COMPENSATES FOR A BAD ARM
Lauren Edlbeck, Kelly Patterson
Category: Kinesiology, Section 1
Location: MSU Room
Time: 11:00 AM-11:15 AM
Mentor(s): Rajiv Ranganathan (Kinesiology)

Stroke is the primary cause of long-term disability in individuals in the United States. Often, this disability manifests itself as hemiparesis, in which half of the body suffers a significant decrease in motor function. Since one side of the body is affected, the other side of the body compensates for this deficit; however, this compensation often limits the recovery of the affected side. Therefore by examining how the nervous system compensates for these deficits, stroke rehabilitation strategies can be adapted to be more efficient and effective. In this study, we simulated hemiparesis in healthy college aged adults using virtual reality. Subjects controlled a cursor on a screen through movement of both hands. Subjects were designated to have one "good" hand and one "bad" hand. When participants used their good hand to move the cursor, the cursor would move in a predictable direction. However, when participants used their bad hand to move the cursor, the cursor would move in an unpredictable direction. We examined how participants changed the movement of both hands to compensate for this deficit, and whether this compensation affected how well they could learn a novel task. Understanding the reaching strategies that are observed in virtually induced stroke could be useful in planning treatment plans for actual stroke victims.

LEAP TO THE FUTURE: NEW TECHNOLOGY FOR HAND AND FINGER MOTION CAPTURE
Matthew Mills, Ally Green
Category: Kinesiology, Section 1
Location: MSU Room
Time: 11:15 AM-11:30 AM
Mentor(s): Rajiv Ranganathan (Kinesiology)

There is a need in therapeutic settings to be able to accurately assess and evaluate motor function. Currently camera-based

motion capture systems are able to precisely track body movements in lab settings. However, they are also expensive and not easily transported, making it difficult to use in a clinical setting. Recently, a small commercial device called the Leap Motion Controller has been developed for tracking hand and finger movements. The Leap device uses cameras and infrared LEDs to capture hand and finger movement and is primarily marketed as a gesture control device (similar to a computer mouse). In this study, we will look at the feasibility of using the Leap Motion Controller as a more affordable alternative to camera-based motion capture systems. We will have participants perform hand and finger motions and compare the accuracy and precision of the Leap motion tracking to a gold-standard motion capture system. If the Leap system shows acceptable accuracy and precision, it could be an extremely valuable tool for tracking movements in clinical settings, as it is both cost effective and easily transported.

WIN SOME, LOSE SOME: THE EFFECTS OF REWARD AND PUNISHMENT IN MOTOR LEARNING
Julie Pieciak, Kevin Piper
Category: Kinesiology, Section 1
Location: MSU Room
Time: 11:30 AM-11:45 AM
Mentor(s): Rajiv Ranganathan (Kinesiology)

The effectiveness of reward and punishment on learning has been widely discussed and researched. Previous studies have demonstrated that being rewarded for good performance results not only in better learning during practice, but also in improved long-term retention when doing movement tracking tasks. The purpose of our study was to examine if these results also generalize to typical motor tasks used in rehabilitation and therapy settings. In our study, we utilized the Box and Blocks Test, a standard motor assessment test in which participants transfer as many blocks from one side of a barrier to the other in a specified time period. Participants were healthy college-aged adults who performed the motor task with their non-dominant hand while wearing motion sensors on their hands. Participants were divided into two groups – the participants in the reward group were rewarded (i.e. gained points) for every block successfully transferred, whereas participants in the punishment group were punished (i.e. lost points) for every block that was not transferred. To evaluate task performance, we measured the overall number of blocks transferred, as well as their hand velocities when they performed this task. In order to measure learning and retention, we measured their performance before and after practice, and also 24hr after practice. By comparing which of the two groups demonstrates better learning and retention, our results could help provide insight on how to structure incentives to maximize motor recovery in rehabilitation settings.

EVALUATION OF DIVISION I ICE HOCKEY PRACTICES AND GAMES VIA HEART RATE MONITORING AND DIRECT OBSERVATION: A PILOT PROJECT
Justin Shureb, Jillian Fimbinger, Daryn Portman
Category: Kinesiology, Section 1
Location: MSU Room
Time: 11:45 AM-12:00 PM
Mentor(s): Jim Pivarnik (Kinesiology)

Heart Rate (HR) monitoring (via telemetry) is used to assess sport training intensity, but the validity of such measurements has not been assessed in collegiate ice hockey. PURPOSE: We compared assessment of on-ice practice intensity via HR monitoring to direct observation. HR monitoring was then used to compare practice and game intensities. METHODS: On-ice practices consisted of high intensity drills, tactical discussions, and game simulations. HR was divided into five intensity zones (50-59%, 60-69%, 70-79%, 80-89%, and 90-100% of maximal HR) for analysis. Direct observation was used to classify intensity into four observation zones (2-5). Percentage of time spent in each HR and direct observation zone was computed for weekly practices on 12 players. Percentage of time spent in each HR zone was also computed for 3 games on athletes playing regular shifts. RESULTS: HR telemetry showed 29.7% of practices were spent at 50-59% of HR max, 23.4% at 60-69%, 22.1% at 70-79%, 22.2% at 80-89%, and 2.7% at 90-100%. Direct observation showed 58.2% of practice time was spent at an intensity level of 2, 28.9% at 3, 12.3% at 4, and 0.6% at 5. Players observed during competition showed 26.6% of games were spent at 50-59% of HR max, 31.9% at 60-69%, 17.6% at 70-79%, 16.4% at 80-89%, and 7.5% at 90-100%. CONCLUSION: HR monitoring appears to be a valid indicator of hockey practice intensity, compared to direct observation. HR data indicate that practice intensity is similar to game intensity for players playing regular shifts.

SEX DIFFERENCES IN BASELINE VESTIBULAR-OCULAR MOTOR FUNCTION AMONG HIGH SCHOOL ATHLETES
Grant Goodfellow, Megan Hughes, James Stathakios
Category: Kinesiology, Section 1
Location: MSU Room
Time: 12:00 PM-12:15 PM
Mentor(s): Tracey Covassin (Kinesiology), Ryan Moran (Kinesiology)

The assessment and management of sport-related concussion (SRC) continues to evolve. Sex related differences have been reported in neurocognitive performance, symptoms, and balance scores in high school athletes. However, no research has investigated differences in vestibular ocular function between sex. Therefore the purpose of this study was to compare baseline sex differences on the Vestibular/Ocular Motor Screening (VOMS) between male and female high school athletes. Athletes were

recruited from an on-going Mid-Michigan sports-related concussion surveillance research program. A total 321 male high school athletes and 170 female high school athletes volunteered to participant in the study. All athletes were administered the VOMS prior to the start of their season. The independent variable was sex (male, female). A multivariate analysis of variance (MANOVA) was conducted between male and female athletes on the VOMS subscales and an independent t-test was conducted on the average convergence test. The p value was set aprior at .05. Results revealed that there were no significant sex differences for the VOMS subscales (F6, 484 =1.80, p=.09). In regards to VOMS convergence, there were also no significant differences between male and female high school athletes (t=-.214, p=.83). While there were no differences between sex on VOMS baseline subscales and convergence, additional research is needed to determine if these findings persist with post-concussion performance on these measures.

ONLINE BEHAVIORAL TRACKING AMONG PREGNANT WOMEN
Montana Pruett, Sara Brady, Alex Smith
Category: Kinesiology, Section 1
Location: MSU Room
Time: 12:15 PM-12:30 PM
Mentor(s): Lanay Mudd (Kinesiology)

PURPOSE: To test the feasibility of using an online platform for self-monitoring of physical activity (PA) and diet in low-income pregnant women. METHODS: Women were recruited into an early pregnancy group (<21 weeks pregnant) and a postpartum group (>33 weeks pregnant) at enrollment. Participants attended two in-person visits to complete surveys and were asked to use an online platform to record their daily PA and diet behaviors every day for 30 days in between the two visits. Surveys included questions on demographics and self-efficacy for eating fruits and vegetables (range: 6-30) and for PA (range: 10-50). The early pregnancy group used the online platform while pregnant, and the postpartum group used it for a month after giving birth. Number of days logged on to the platform and number of diet days and PA days reported were used to determine compliance. RESULTS: Thus far, eight women have completed the study (5 early pregnancy, 3 postpartum). Most participants were of low socioeconomic status based on WIC eligibility. Self-efficacy scores for both diet (mean=21) and PA (mean=40) were moderately high. Overall usage of the online platform was very low. A majority of participants logged in (75%), recorded food data (50%) or PA data (88%) less than 5 times during the month. Only one woman recorded food data for all 30 days. CONCLUSION: There was low engagement with the online platform. Future studies should consider use of a mobile app instead of a traditional website for logging behavior.

POSTER PRESENTATIONS, SECTION 1
LAKE HURON ROOM, 9:00-11:00 AM

IT'S NEVER TOO LATE TO LEARN: DIFFERENCES IN MOTOR SKILL LEARNING BETWEEN CHILDREN AND ADULTS
Emma Bizzigotti, Brittany Ladson
Category: Kinesiology, Section 1
Poster: 329
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Mei-Hua Lee (Kinesiology)

When is the best time to learn motor skills? There is discrepancy in findings as to which age group learns motor skills best. Some findings suggest that younger age groups learn new motor skills better, whereas other studies have found that motor skills may be best learned in adulthood. This question is difficult to answer in real-world tasks because differences between children and adults in the ability to learn are also confounded by physical differences in body size and body composition. Therefore the purpose of this study was to investigate the differences between the way children and adults learn a novel virtual motor task where we could minimize these physical confounds. We compared motor learning in children and adults by using a customized body machine interface (BoMI) where participants used their shoulder movements to move a cursor to different targets on the screen (virtual reaching). Typically developing children (9 and 12 years) and adults (21 years) were tested and their task performance (movement time and strategy) was analyzed. Results show that children and adults do learn new motor tasks differently. Overall, children had longer movement times and poorer ability to control the cursor in comparison to adults. These differences suggest that training schedules should be tailored to different age groups, and have implications for rehabilitation schedules in therapy settings.

CAN YOU ACHIEVE FITNESS GOALS WITH A GAME?
Danielle Bouchard, Brittany Glaab , Sarah Schulte
Category: Kinesiology, Section 1
Poster: 330
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Alison Ede (Kinesiology), Deborah Feltz (Kinesiology), Christopher Hill (Kinesiology)

The purpose of this study is to determine if adults can have confidence in an exercise video game to help them achieve their

exercise goals. As part of a larger, ongoing longitudinal study, participants exercise 6 days per week for 24 weeks on a stationary bicycle, along with an exercise video game. The purposes of this portion of the study are to determine a) what exercise behaviors adults need help with to achieve their goals, b) if they have confidence in an exercise video game to help them with those behaviors, and c) to determine if there are differences by gender in those beliefs. Twenty-one adult chronic exercisers (11 female, 10 male) were asked to list behaviors that they need help with to achieve their exercise goals. When they completed the first week of the exercise program, they rated their confidence in the workout program to help them with those behaviors (i.e., proxy efficacy) on a scale from 0 (not at all confident) to 10 (completely confident). After week 2, when they completed the first week of the exercise video game, they rated their confidence in the exercise game to help them with the same behaviors. Results will be analyzed by coding types of behaviors into categories, averaging proxy efficacy beliefs for an overall score, and then testing for group differences by gender.

THE PERFECT BALANCE BETWEEN ACCURACY AND ACCESSIBILITY: USING INERTIAL MEASUREMENT UNITS FOR BALANCE TESTING
Arielle Farhi
Category: Kinesiology, Section 1
Poster: 331
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Tracey Covassin (Kinesiology), Mei-Hua Lee (Kinesiology)

In many sports, athletes who have suffered a concussion can be put at risk for major brain damage. Therefore it is extremely important to be able to quickly and accurately diagnose concussions on the sidelines. One of the key indicators that is often used to diagnose concussions is through balance tests. There are currently multiple ways to assess balance that span a wide range in terms of how easy they are to administer and how accurate they are. On the one hand, clinically used balance tests (such as the BESS test) are easily administered on the sideline, but are not sensitive to small changes in balance. On the other hand, technologies such as a force plate are extremely sensitive to even slight changes in balance, but these are not portable enough to be used on the sideline. Therefore, the goal of this study was to test the use of an inertial measurement unit (IMU) for measuring balance, which could provide an ideal combination of both high accuracy as well as ease of use on the sidelines. We will compare the accuracy and reliability of four methods of measuring balance -- the BESS test (which relies on testing balance in different postures), the force plate, the iPad Sway app and the IMU sensors. The outcome of this study is to establish if IMUs could be used as a portable and accurate method to evaluate balance in athletes, thereby improving the detection of concussions on the sidelines.

THE RELATIONSHIP BETWEEN ACADEMIC SUCCESS AND NEIGHBORHOOD RECREATIONAL SPORTS USE
Sara Krebs
Category: Kinesiology, Section 1
Poster: 332
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): James Pivarnik (Kinesiology)

Michigan State University has developed neighborhoods within on-campus residential housing to provide students with localized health, wellness, and academic resources. While previous literature shows a positive relationship between campus wide recreational sports and academic success, previous work by our group failed to find similar results using neighborhood specific recreational sports group fitness participation. However, academic success is a complex construct and we did not control for confounding variables. PURPOSE: To determine differences in semester grade point average (GPA) and credits completed between neighborhood specific recreational sports group fitness users and non-users. METHODS: Subjects included samples of users (n=320) and non-users (n=320) matched on high school GPA, race, socioeconomic status, gender, and class. Means ± SD and percentages were calculated for all variables of interest. Paired sample t-tests were used to assess differences in GPA and credits completed between users and non-users. RESULTS: Overall demographic breakdown showed 79.8% Caucasian, 93.9 % female, 23.0 % pell grant eligible, and high school GPA (mean±SD)= 3.74±0.27. Semester GPA was significantly higher ($t(639)=4.85$, $p<0.0001$) in group fitness users (3.35±0.66) than non-users (3.18±0.76). No difference ($t(639)=-1.94$, $p=0.053$) was found in credits completed between users (0.29±1.30) and non-users (0.45±1.61). CONCLUSIONS: Participation in neighborhood specific group fitness is positively related to semester GPA, but not semester credits completed. Future research should explore the mechanism of this relationship and investigate the relationship between neighborhood specific group fitness participation and other markers of student success, such as one-year retention.

DIFFERENCES IN GPA AMONG LOW, MEDIUM, AND HIGH RECREATIONAL SPORTS USERS AND THEIR PERCEIVED WELLNESS BENEFITS
Andrew Kaplan
Category: Kinesiology, Section 1
Poster: 333
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM

Mentor(s): Jim Pivarnik (Kinesiology)

Literature shows a positive relationship between recreational sports (RS) use and college student grade point average (GPA). Minimal research has investigated the relationship between amount of RS participation and GPA. PURPOSE: 1) To investigate differences in Fall 2013 semester (FS13) GPA among RS use groups (low, medium, high), and 2) determine mechanisms for the relationship between RS participation and GPA. METHODS: An online survey was sent to MSU freshmen students in FS13; after exclusion criteria the sample included 50 students. Students reported days/week and hours/week of RS participation. Socioeconomic status (SES) was reported as highest level of parental education. The Registrar provided high school GPA (HsGPA) and FS13 GPA. Means±SD were calculated for all variables. Unadjusted differences in GPA among RS use groups were assessed via ANOVA, and differences adjusted for HsGPA and SES via ANCOVA. In the Spring 2014 semester 30 students completed a second survey and reported on a scale of 1 (very negatively) to 5 (very positively) how RS participation affected 10 different wellness variables. RESULTS: Overall sample HsGPA=3.57±0.28 and GPA=3.26±0.68. GPA differed significantly among RS use groups p=0.048. Specifically, medium users (3.61±0.26) achieved a higher GPA than low (3.06±0.95) or high users (3.14±0.58). After controlling for confounders, HsGPA was the only significant predictor of GPA. ⩾90% of students reported RS participation positively influenced psychosocial factors. CONCLUSION: Medium use of RS was more beneficial to GPA than low or high use. Psychosocial factors may explain the relationship between RS participation and GPA.

SEX DIFFERENCES IN BASELINE KING-DEVICK, SAC, BESS, AND SYMPTOM REPORTS AMONG HIGH SCHOOL ATHLETES
Kelly Julin
Category: Kinesiology, Section 1
Poster: 334
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Tracey Covassin (Kinesiology)

The purpose of this study was to compare baseline sex differences on the King-Devick (KD), Standardized Assessment of Concussion (SAC), Balance Error Scoring System (BESS), and symptom reports between male and female high school athletes. Athletes were recruited from an on-going Mid-Michigan sports-related concussion surveillance research program. A total 136 male high school athletes and 129 female high school athletes volunteered to participant in the study. All athletes were administered the KD, SAC, BESS, and a symptom scale prior to the start of their season. The independent variable was sex (male, female). Independent t-tests were conducted between male and female athletes with a p value set at .05. There were significant sex differences for the BESS (M=14.9+7.4, F=13.2+5.5, p=.04) and SAC (M=25.6+4.7, F=26.7+2.3, p=.03) total scores. Specifically, male athletes had more errors on the BESS and lower SAC scores compared to female athletes. There were no significant sex differences on the KD (M=43.8+9.2, F=45.2+6.9, p=.17) and symptom reports (M=3.2+4.7, F=4.0+6.6, p=.264). Male and female high school athletes exhibited differences on baseline BESS and SAC performance, with males performing worse than females. Additional research is needed to determine if these findings persist and influence post-concussion performance on these measures.

INTERFERENCE BETWEEN HANDS IN BIMANUAL REACHING
Elana Miller, Julia Porter
Category: Kinesiology, Section 1
Poster: 335
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Florian Kagerer (Kinesiology)

Using both hands at the same time for different movements has a high potential for interference. Little is known about the nature of interference exerted by the dominant on the nondominant hand, vs. the nondominant on the dominant hand. In this study we used a paradigm in which both hands performed target-directed movements under visual control, first under conditions of normal visual feedback (12 trials:pre-exposure). After that, one hand was exposed to an abrupt 60 degree visual feedback rotation for 120 trials (exposure), while the other hand operated under veridical visual feedback. This was followed by re-introducing veridical visual feedback to the previously perturbed hand (48 trials:post-exposure). The visual feedback perturbation in one hand resulted in updating this hand's visuomotor map, while the other, unperturbed hand could continue to use its established 'normal' visuomotor map. 14 right-handed participants were randomly assigned to one of two groups: group 1 experienced the perturbation in the dominant right hand, and group 2 in the nondominant left hand. We were interested how robust the unperturbed hand's sensorimotor map was against interference of the perturbed hand. Preliminary results show asymmetric directional interference: right hand adaptation interfered slightly more with the left hand (group 1) than left hand adaptation interfered with the right hand (group 2). The results support recent theories of functional lateralization suggesting dominance of the right hand for trajectory control. The results are discussed in the context of potential neural crosstalk.

POSTER PRESENTATIONS, SECTION 2
LAKE HURON ROOM, 1:00-3:00 PM

CLINICAL USE OF THE STEPWISE PROGRESSION AMONG PRACTICING ATHLETIC TRAINERS
Dilpreet Barnes, Jason Avedesian
Category: Kinesiology, Section 2
Poster: 337
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Tracey Covassin (Kinesiology), Jessica Wallace (Kinesiology)

Consensus statements unanimously emphasize certified athletic trainers (ATs) to use the stepwise progression to determine whether or not a concussed athlete should be returned to play (RTP). The stepwise progression can exacerbate symptoms through exertion, and is a safe way to determine whether or not an athlete is ready to RTP. If an athlete is returned to play while symptomatic, catastrophic events can occur. Participants completed a survey online distributed by the National Athletic Trainers' Association. A total of 190 practicing certified ATs responded to the survey (response rate =19%). We examined the frequency of athletic trainers that are using the stepwise progression as the standard to make a RTP decision following a concussion, and if employment setting, years practicing, and the number of concussions treated predicted whether or not the stepwise progression was used. Statistical significance was set aprior at p=.05. Approximately 37% of ATs are working at the high school level, 15% are working at the Division I level, and 12% are working at the Division III level. Approximately 84% of the ATs self-reported following all steps of the stepwise progression to make a RTP decision following a concussion, and 90% self-reported waiting at least 24 hours before progressing to the next step. Results showed that employment setting, years practicing, and the number of concussions treated in the past year did not significantly predict whether or not ATs are using the stepwise progression to make a RTP decision ($r = .162$, $p < .262$).

EXAMINING GENDER BIAS IN OLYMPIC FIGURE SKATING COVERAGE: A CONTENT ANALYSIS OF TELEVISED COMMENTARY
Sara Krebs
Category: Kinesiology, Section 2
Poster: 338
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Andy Driska (Kinesiology)

There is a growing amount of research investigating the representation of female athletes. Many of these studies are formed off the premise that female athletes are competing in a masculine world. Little research has been done investigating the representation of male athletes in a stereotypical feminine sport. PURPOSE: To examine the differences between Olympic figure skating commentary for male and female athletes. METHODS: Content analysis and transcription was completed for a one-hour segment of 2014 Olympic individual figure skating coverage, for both males and females. Descriptive commentary was deductively coded using eight categories: (a) technique/athleticism, (b) intelligence/mental skill/personality, (c) determination/motivation, (d) appearance, (e) feminine adjectives (f) masculine adjectives, (g) background, and (h) other. Within each deductive code, comments were labeled as positive or negative with regards to the performer. Sums and percentages were calculated for each code. RESULTS: Male athletes had a higher percentage of comments referring to athleticism (38%), while females had a higher percentage of comments referring to intelligence (19%), motivation (14%), appearance (5%) and masculine adverbs (9%). Although, females also had a higher percentage of positive comments (46%) compared to males (38%), negative comments occurred in the same percentage for males and females. CONCLUSION: A role reversal was not found; men were not largely over-feminized through commentary despite the feminine construction of the sport. Masculine qualities were commented on as advantageous and feminine qualities of female athletes were emphasized. Additionally, similar to other sports, qualities such as aggression and strength were revered.

EFFECT OF EXERCISE ON AEROBIC OUTPUT AND OXIDATIVE CAPACITY IN OLDER ADULTS
Stephen Kazmer
Category: Kinesiology, Section 2
Poster: 339
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Brian Schutte (Microbiology and Molecular Genetics), Jill Slade (Radiology)

Traditionally whole body maximal aerobic capacity (VO2max) is used to study improved aerobic metabolism following exercise training. Magnetic resonance spectroscopy (MRS) examining muscle phosphocreatine re-synthesis can alternatively be used to assess more localized responses that arise from muscles undergoing training. Both have been highly utilized for research. In a randomized trial of exercise training in older adults, more robust changes were observed using MRS compared with VO2.

FEELING LIKE A TEAM: CONFIDENCE IN A PARTNER TO HELP WITH EXERCISE GOALS IN A VIDEO GAME
Andy Rabaut, Russell Curl, Alissa Mossbarger
Category: Kinesiology, Section 2
Poster: 340
Location: Lake Huron Room

Time: 1:00 PM-3:00 PM
Mentor(s): Alison Ede (Kinesiology), Deborah Feltz (Kinesiology), Christopher Hill (Kinesiology)

The aim of the current study is to utilize principles of group dynamics to help motivate astronauts to exercise at higher intensities. As part of the larger, longitudinal experiment, we are testing characteristics of a software-generated (SG) workout partner to determine how SG partners can be used in exercise settings during space missions. For this portion of the study, we are examining if adults have confidence in their SG partner's ability to help them achieve their exercise goals. A sample of 13 participants (7 women and 6 men), similar in age to astronauts, were screened prior to the study to assess their activity levels and were chosen because they meet the minimum criteria of exercising moderately at least 3 days per week. As part of the larger study, participants completed workouts on a stationary bicycle, while viewing an exercise video game, 6 days per week for 24 weeks. During the first three weeks of the study, participants completed surveys immediately after their workouts. These surveys asked what behaviors the participants felt they needed help with and how confident they felt their partner was in helping them to achieve these behaviors. These assessments were followed by questions asking participants to rate team perceptions, group identification, and social comparison to their partner. Results will be analyzed using correlations and linear regression models, and implications of this research will be discussed.

FINDING AN OPTIMAL PRACTICE SEQUENCE FOR LEARNING A NOVEL MOTOR TASK
Andrew Cusmano, Emily Matthews, Danielle Puckett
Category: Kinesiology, Section 2
Poster: 341
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Mei Hua Lee (Kinesiology)

What is the best way to learn a motor task? Previous studies have shown that there are different factors in the practice schedule that influence learning – e.g., the amount of practice, the time between practice sessions, and the sequence in which tasks are practiced. The practice sequence is particularly important in many real-life tasks such as basketball, where there are multiple skills (e.g., dribbling, free throws, jump shots) that all have to be mastered during practice. The purpose of this study was to examine the effect of the practice sequence on motor learning – specifically we asked if participants show greater learning if they have control over the sequence in which they practice tasks. In this experiment, college students (17-23 years) were assigned to one of three practice sequences: random (in which the practice sequence was randomly determined), self-controlled (where participants could select their own practice sequence), and self-controlled with visual variation (change in target size). Participants wore four lightweight inertial measurement unit (IMU) sensors which were used to detect shoulder movements. Participants moved their shoulders to guide a cursor into a target as quickly and as accurately as possible. Results showed that participants who had one of the two self-controlled sequences moved the cursor more accurately at the end of testing than participants who had a random sequence. Self-controlled sequence could be used by coaches, instructors, and therapists to help improve performance of a motor task.

BARRIERS TO STUDENT PARTICIPATION IN NEIGHBORHOOD SPECIFIC GROUP FITNESS CLASSES
Annie Bryers
Category: Kinesiology, Section 2
Poster: 342
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Jim Pivarnik (Kinesiology)

Michigan State University (MSU) has implemented a neighborhood residential housing design to serve as a student support network. Neighborhood resources provide assistance with academic, health and wellness, intercultural, and residential needs. Recreational Sports and Fitness Services (RSFS) contributes by providing neighborhood specific group fitness classes. However, previous research has shown that 50% of neighborhood specific recreational sports users attend only one group fitness class each semester. PURPOSE: To identify likes, dislikes, and major barriers to participation in neighborhood specific RSFS group fitness classes. METHODS: An online survey was sent to all MSU students who participated in any neighborhood specific group fitness class in the Fall 2014 semester (FS14). Survey questions included likes, dislikes, and barriers to participation in the classes. RESULTS: 138 of the 847 group fitness users (16.3%) completed surveys. The majority of respondents (80%) did not purchase a membership to general recreational sports fitness facilities or outside of neighborhood group fitness classes during FS14. Zumba™ was the most attended (70% of participants) neighborhood specific group fitness class. Students liked the instructors and class locations, but disliked class time offerings. Poor advertisement and time were reported as the largest barriers. CONCLUSION: RSFS should continue offering neighborhood group fitness classes because students like the location. However, future implementation of neighborhood group fitness classes should explore different class time offerings and new forms of advertisement to best reach students.

LINGUISTICS, LANGUAGES, & SPEECH

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 1:00-3:00 PM

WHAT UNDERLIES THE MARATSOS EFFECT, AGENTIVITY OR EVENTIVITY?
Taylor Sydow, Tess Huelskamp, Susima Weerakoon
Category: Linguistics, Languages, and Speech, Section 1
Poster: 345
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Adam Liter (Linguistics and Languages), Alan Munn (Linguistics and Languages), Christina Schmitt (Linguistics and Languages)

One important question in linguistics is how children acquire language. An aspect of language that is acquired late is the passive construction, as in "Susan was chased by Mary". Interestingly, children seem to acquire passives of "actional" verbs ('chase' or 'tear') before passives of "non-actional" verbs ('see' and 'hear'). This is known as the Maratsos Effect (Maratsos et al. 1979). Though it has been widely replicated (Maratsos et al. 1985; Sudhalter & Braine, 1985; among others), researchers haven't clearly differentiated "actional" and "non-actional" verbs, making it difficult to determine what actually causes the Maratsos Effect. Two properties that might underlie the so-called "actional"/"non-actional" distinction are agentivity or eventivity. A verb is considered to be agentive if it can be used with the word 'deliberately'. The fact that "Mary deliberately kicked Bill" is an acceptable sentence shows that 'kick' is agentive, whereas the fact that "John deliberately fears spiders" is an unacceptable sentence shows that 'fear' is non-agentive. A diagnostic for eventivity is whether a verb can be used with "what happened was". The acceptability of "what happened was Mary kicked Bill" shows that 'kick' is eventive, whereas the unacceptability of "what happened was John fears spiders" shows that 'fear' is non-eventive. To determine what might be driving the Maratsos Effect, we report two experiments testing 3-6 year-olds' abilities to interpret passives. Experiment 1 compares performance on eventive and agentive verbs and eventive but non-agentive verbs, and experiment 2 compares non-eventive and non-agentive verbs to eventive and non-agentive verbs.

SEEKING PERFECTION IN DEATH: UNDERSTANDING ENGLISH SPEAKERS' USE OF THE PERFECT
Tess Huelskamp, Adam Smolin, Susima Weerakoon
Category: Linguistics, Languages, and Speech, Section 1
Poster: 346
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Adam Liter (Linguistics and Languages), Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Tense morphology helps determine whether a situation that is being described as having happened before or after the utterance-time of the sentence. English distinguishes between Simple Past tense (John ate) - which places a situation as having happened before the utterance-time - and the so-called Present Perfect tense (John has eaten) - referring to a situation that started before but has present relevance. It has been observed that American English speakers use the Perfect tenses less than British speakers. The use of the Perfect is being substituted by the Simple Past, especially in contexts where it is the result state of an event that has current relevance (The taxi has arrived) as opposed to a past situation extending to now (Mary has lived here since 2013). We present the results of experiments designed to test whether the decrease in frequency of use is being reflected in speaker's acceptability of sentences involving the Perfect. We tested undergraduates' acceptability judgments for simple past and present Perfect sentences with well-known figures who are either alive or dead (Barack Obama/George Washington worked/has worked as president). Sentences with the Present Perfect that involve dead participants should be unacceptable as the Perfect forces the situation to hold at utterance-time. Sentences with participants that are alive should pose no problem for the Present Perfect but may be awkward with the Simple Past. If subjects have reanalyzed the properties of the Present Perfect, they may not show such distinction and may prefer both sentences with the Simple Past.

"HAVE YOU ATE TOO MUCH?": AN ANALYSIS OF PARTICIPLE LEVELING IN AMERICAN ENGLISH
Lauren Edlbeck, Bethany Flanagan, Maddie Roman
Category: Linguistics, Languages, and Speech, Section 1
Poster: 347
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Although we tend to think languages are an unchanging set of rules, they are actually constantly changing. Even people as individuals speak in variable ways. One ongoing change in American English is the regularization of irregular verbal participles. For example, in one context, a person could say, "He shouldn't have eaten so much," and in another, "He shouldn't have ate so much." This subtle verb difference is called participle leveling. The first example is a sentence that people consider "standard" grammar. The second sentence contains a leveled participle: the past tense form of 'eat' ('ate') is used instead of the standard

participle form ('eaten'). In this project we investigate speakers' judgements of sentences containing leveled and unleveled participles. Participants listened to a series of sentences and rated their grammatical acceptability on a scale of 1 to 5 (5 being the best and 1 being the worst). Some groups heard sentences containing unleveled (standard) participles while others heard sentences containing leveled participles. Four different syntactic contexts were tested: modal auxlilary ('could have ate/eaten'), past perfect ('had ate/eaten'), present perfect ('has ate/eaten'), and passive ('was ate/eaten'). Our results showed that the highest scoring sentences with leveling occurred in the modal context. Examining patterns in language is useful when looking at how language changes. Leveling participles is something that many people think goes against "standard" English. However, as it increasingly becomes more common in everyday speech, the leveled form of participles is likely to become acknowledged as grammatically correct.

PREDICTING PERSISTENCE AND RECOVERY IN DEVELOPMENTAL STUTTERING
Jessica Prieskorn, Alexandra Barman, Alexandra Powers
Category: Linguistics, Languages, and Speech, Section 1
Poster: 348
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Soo-Eun Chang (Communicative Sciences and Disorders)

Developmental stuttering is a speech disorder that occurs in approximately 5% of preschool-aged children, with natural recovery occurring in up to 80%. Stuttering is clinically characterized by stuttering-like disfluencies (SLDs), which includes part and whole-word repetitions (PW, WW), and dysrhythmic phonation (DP), which include sound prolongations, and blocks. There is a lack of objective markers that may help determine which children will naturally recover from stuttering versus those that will persist. Our study aims to determine whether certain SLDs can serve as prognostic indicators for recovery in children who stutter. We hypothesize that children who primarily exhibit repetition type SLDs (PW, WW) close to stuttering onset (within 2 years of symptom onset) will exhibit decreased stuttering severity when examined 2-3 years post onset; whereas those exhibiting primarily prolongation type SLDs (DP) will exhibit similar or increased stuttering severity. Data were collected from 19 children who stutter (12 Males, 7 Females) from 3-6 years of age who are currently participating in a 5-year longitudinal study at Michigan State University. Speech samples were transcribed and stuttering severity was assessed and determined as moderate or severe using the Stuttering Severity Instrument (SSI-4). Stuttering severity data have been collected from children 5-8, and will be analyzed in relation to the baseline (at ages 3-6) stuttering characteristics (predominantly repetition vs. DP type disfluencies). Current findings have the potential to provide an increased understanding of developmental stuttering, and developing prognostic factors that help prioritize treatment for those children most likely to develop persistent stuttering.

A NEW LEVEL: STUDYING PARTICIPLE LEVELING IN AMERICAN ENGLISH
Katherine Cox, Owen Keenoy, Nitish Pahwa
Category: Linguistics, Languages, and Speech, Section 1
Poster: 349
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Language is an ever changing phenomenon. Language change throughout generations occurs when children are exposed to variants in language use and acquire a grammar based on the variants. One ongoing change in American English is the leveling of verbal participles. Participle leveling is the process of regularizing irregular verbs, as in "I could have ate this sandwich" as opposed to saying "I could have eaten this sandwich". Studies on leveling in adult speakers have shown that adults prefer to level in the context of a modal verb such as 'could' or 'should', ("could have ate/eaten") but resist leveling in the context of the present tense ("have ate/eaten"). To study this phenomenon in children, we used the technique of elicited production. Children listened to stories that we had written, accompanied with pictures, that centered around verbs with irregular participle forms. Then they had to complete a sentence with the participle form of the verb. Our results show the degree to which children match the leveling patterns of the adult data.

TWITTER ON FLEEK: THE USE OF SOCIAL MEDIA IN THE FACILITATION OF NOVEL WORDS
August Jenkins
Category: Linguistics, Languages, and Speech, Section 1
Poster: 350
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Suzanne Wagner (Linguistics and Languages)

The rise of social media and electronic communication as an everyday occurrence has facilitated the creation of novel words and phrases to accurately express oneself. Although many new phrases are created frequently, certain words "catch on" and become adopted by the mainstream population. In this study the use of the novel word fleek, which is often described as meaning "on point," was monitored and analyzed, tracking developing trends surrounding the word following its first use in 2014. In this study, over 1,000 Twitter tokens containing "fleek" were collected over a 3-month time span. These tweets were

analyzed for how the term was used (i.e., if the term rivaled the linguistic situations in which “on point” could be used or if “fleek” expanded the use) and investigated the most popular syntactic form of fleek (“fleek” vs. “on fleek” following or proceeding what it referred). Since “fleek” originates from the African-American community, tweets were also monitored for the co-occurrence of African-American Vernacular English (AAVE) within the tweet to determine who was licensed to use the term. The study revealed that fleek is used often times in the same place as “on point” as a replacement, but can also used in additional environments as well. Furthermore, it was found that earliest tweets had more co-occurrences of AAVE within tweets while later tweets did not, suggesting that as “fleek” has become more popular it has become less strongly associated with the African-American community.

TO HAVE OR NOT TO OF: REANALYSIS OF AUXILIARY 'HAVE' IN AMERICAN ENGLISH
Anna Thomas, Haley Clayton, Samantha Dicks
Category: Linguistics, Languages, and Speech, Section 1
Poster: 351
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Alan Munn (Linguistics and Languages), Christina Schmitt (Linguistics and Languages)

Language is constantly changing. One kind of change ongoing in American English is found in people’s spelling of the auxiliary verb ‘have’ as ‘of’ (“I could’ve left vs. I could of left”). While some view this as bad spelling or poor grammar, it is more likely an indication that ‘have’ is beginning to be analyzed differently than the auxiliary verb it is for other speakers. We present data from two experiments testing the degree to which speakers have reanalyzed “have” as something else. One piece of evidence of this phenomenon is the appearance of two perfect auxiliary verbs in one sentence. In sentences like “If I hadn’t have/of done that…” the second ‘have’ must be pronounced as ‘of’, and in identical sentences without ‘if’ (“I hadn’t have/of done that”) the extra “have” is impossible. The second piece of evidence that demonstrates this phenomenon is the movement of contracted “have” in questions. To turn the sentence “He could’ve left already” into a question the first auxiliary verb moves to the left of the subject as in “Could he have left already?”, undoing the contraction of ‘have’. Some speakers are not undoing this contraction, resulting in questions such as “Could’ve he left already?” This might be further evidence that this ‘have’ that's spelled ‘of’ is actually something different. We present data from spoken acceptability judgments of adult speakers on these sentence types to test the degree to which speakers have reanalyzed ‘have’ as ‘of’.

THE ACQUISITION OF CLITIC DOUBLING IN SPANISH
Amazona Alfonso
Category: Linguistics, Languages, and Speech, Section 1
Poster: 352
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Cristina Schmitt (Linguistics and Languages)

In many dialects of Spanish, it is possible to use both a pronoun and a co-referential proper noun, as in (1) in the same sentence. This construction is called a clitic-doubling construction. Different dialects behave differently with respect to their use and acceptability. Much work has been done to understand their properties. In this project we use corpus data to examine how children acquire these constructions in three dialects of Spanish which vary in the way clitic-doubling is used quantitatively and qualitatively: Mexican, Chilean and Argentinian Spanish. We hypothesize that if frequency of use is what matters for children, Argentinian children should master the doubled forms first, since they are very frequent in this dialect. However, if the use of the doubled forms by children reflects a particular discourse situation, then doubled forms will appear in children in all three dialects. Lo vi a Juan; Him I-saw a Juan.

CONTRASTIVE FOCUS AND CONTRASTIVE REDUPLCATION: NOT ONLY SALAD-SALAD
Kyle Latack, Mina Hirzel
Category: Linguistics, Languages, and Speech, Section 1
Poster: 353
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

There is a process in English called contrastive reduplication (CR) which duplicates a word or phrase and allows for a specific meaning relative to a context. Thus, a salad-salad is not any salad, but a typical salad. Semantically, what the CR does is force a set of alternatives to be imagined, and the best choice for the context to be chosen as the meaning of CR. This process is similar to what happens when we add "only" to a sentence. When we say "only the firefighter is holding a hose" we assume there are other alternative participants to be considered, but they do not fit the description of holding a hose. Studies have claimed that children have difficulties computing alternatives and are not adult-like in the interpretation of only sentences. To test children and adults' ability to compute alternatives for CR, a "magic box" experiment will be used. In this task, participants are trained to choose a covered box when the correct choice is not shown in the other boxes. If participants can compute alternatives for CR, they will choose the magic box when no best option is available. For example, when presented with "choose the hammer-

hammer", they should choose the magic box if the choices are a toy hammer or a nail. To analyze children's ability to compute focus alternatives, they will also receive prompts using only. The results from this experiment will provide insight on the relationship between children's ability to compute focus alternatives for only and CR.

MICROBIOLOGY, IMMUNOLOGY, & INFECTIOUS DISEASE

POSTER PRESENTATIONS, SECTION 1
MOSAIC MULTIPURPOSE ROOM, 9:00-11:00 AM

ANTIGENIC PROFILE OF THE EMERGENT MAMMALIAN PATHOGEN LAGENIDIUM GIGANTEUM
Brady Parr, Erik Blackowicz, Kendall Christy, Albert Tamayo
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 357
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Leonel Mendoza (Biomedical Laboratory Diagnostics)

Members in the genus Lagenidium have been increasingly recovered in culture as an infectious agent of mammals. The lack of treatment options highlights the need to investigate these emerging Oomycota species. Our study compares known thermo-sensitive strains of Lagenidium giganteum affecting mosquito larvae with those thermos-tolerant L. giganteum strains recovered from mammals with lagenidiosis. The investigated strains were cultured in Sabouraud broth, and the proteins from the cell mass extracted and evaluated in SDS-PAGE. Our data showed the protein profile of both L. giganteum types were almost identical except for the location of high (71-72 KDal) and lower (23-24 KDal) molecular weight proteins. This study suggests L. giganteum types share similar protein profiles, but some differences are also present, a finding of importance for future research on this pathogen of mammals. To examine which of the antigens on the SDS-PAGE are of relevance during infection, a serum sample from a dog with lagenidiosis was evaluated in western-blot. These preliminary analyses are of importance for the development of new diagnostic tools and novel drugs and to understand the mechanisms of virulence of these newly emerging pathogens.

VIRUS-LIKE PARTICLE Qβ AS A CARRIER IN GM2 SPECIFIC ANTI-CANCER VACCINES
Claire Baniel
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 358
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Xuefei Huang (Chemistry)

Despite continuing efforts of doctors and scientists around the world, cancer mortality rates remain high. The majority of cancer treatments are highly invasive procedures that have many harmful side effects and take their toll on the patients. In order to best combat cancer, scientists are now studying ways to use patients' own immune systems to treat cancer more specifically. Immunotherapies, and specifically anti-cancer vaccines, provide a promising solution to the problem of finding a balance between killing cancer cells without damaging healthy cells that the patients need. In order to do so, often times Tumor Associated Cancer Antigens (TACAs), which are often overexpressed on cancer cells, are targeted using anti-cancer vaccines. Our project explores the use of the virus-like particle (VLP) Qβ as a non-traditional carrier linked to the TACA GM2, which is expressed on many cancer cells. The use of the VLP Qβ is beneficial for many reasons, including the icosahedral structure, multiple linkage sites, and its role as a natural adjuvant. There are many challenges associated with developing anti-cancer vaccines that prompt a sufficient immune response without stimulating a suppressive response. We are currently in the process of optimizing the parameters of anti-cancer vaccines to make them as effective as possible. In this study we determine whether the quantity and quality of anti-GM2 antibodies can be increased through use of a Qβ-GM2 anti-cancer vaccine in murine models. This will be measured using titers obtained from Enzyme Linked Immunosorbant Assays (ELISA), flow cytometry, and complement dependent cytoxicity assays.

DEFAULT SIZE BORDERS FOR THE CMEIAS- 3 OPERATIONAL MORPHOLOGICAL UNIT CLASSIFIER
Danielle Stawkey
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 359
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Frank Dazzo (Microbiology and Molecular Genetics)

The Center for Microbial Analysis Software (CMEAIS) is a computer program that uses digital analyses to measure the ecophysiology, morphology and a number of other quantities of microbial communities at spatial scales directly relevant to

individual cells. The specific focus of this research was to create a default size border file that defines the multilinear subclassification of cell sizes for each of the 11 morphotypes that are accurately classified by CMEIAS. The work involves the identification of statistically relevant upper class limits for size metrics of area, length, width and elongation of representative cells for each morphotype. Together, these variables are combined computationally to produce bin classes called Operational Morphological Units that define the mathematical rules for the CMEIAS-3 OMU classifier.The default size border created would be an update to the original default size border, which mainly focused on the more common morphtypes of Regular Rods and Cocci. The update includes the common morphtypes along with the less common morphtypes to create a more comprehensive view of microbial analysis of earth. The specific statistical calculations showing the default size border used for comparing the old and new borders are still in progress. The current default size border file (work still in progress) provides the statistically significant multilinear upper bin class limits enabling CMEIAS to classify 875 OMUs, representing a significant increase from the 55 OMUs provided by the original default size border file.

IMPROVING TUBERCULOSIS DETECTION USING SMEAR MICROSCOPY
John Shinners, Nathan Murray, Kasey Pryg
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 360
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Smear microscopy using Ziehl-Neelson staining is a popular method to diagnose Mycobacterium tuberculosis around the world. Diagnoses using smear microscopy are shown to have varying accuracy and sensitivity. More accurate methods are often too expensive. This experiment seeks to inexpensively improve the accuracy of smear microscopy and uses nonpathogenic surrogate bacteria Mycobacterium smegmatis. The assay employs a functionalized magnetic nanoparticle to capture the bacteria. The magnetic nanoparticle was added to the M. smegmatis suspended in artificial sputum and was magnetically separated from the solution. The bacteria interact with the nanoparticle and, when subject to separation, the bacteria are pulled from the sputum. The nanoparticle and captured bacteria were then suspended and concentrated in solution and subjected to smear microscopy. Nanoparticle capture paired with smear microscopy presents promising results and offers the advantages of concentrating the bacteria present in the smear and localizing the bacteria to facilitate detection.

NOVEL TUBERCULOSIS DIAGNOSTIC TECHNIQUE USING NANO-BIOSENSOR
Nathan Murray, Kasey Pryg, John Shinners
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 361
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Mycobacterium tuberculosis causes tuberculosis (TB) and remains to be a prevalent health burden around the world. The severity of this disease, paired with the high number of cases in low-resource countries, presents the need for a fast and cost effective diagnostic technique. This has opened up an opportunity for the development of a novel nano-biosensor using functionalized magnetic nanoparticles for bacterial capture and gold nanoparticles for detection. In this study, the functionalized magnetic nanoparticle was used to capture a non-pathogenic Mycobacterium smegmatis as a surrogate for M. tuberculosis. The capture efficiency was determined using a combination of magnetic separation technique in artificial sputum and spread plating. Preliminary results showed that the capture efficiency was 85% or higher, making the functionalized magnetic nanoparticle a viable option for fast target extraction of bacterial cells.

ENVIRONMENTAL IMPACT OF BACTERIAL COMMUNITIES IN LARGE VS. SMALL PORED SOIL
Tracy Hodges
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 362
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Terence Marsh (Microbiology and Molecular Genetics)

Nitrogen is the most in demand nutrient for plants. Because all atmospheric nitrogen must be reduced by nitrogen-fixing microorganisms before it can be used by the plants, exploitable nitrogen is often supplemented for the plants via chemical nitrogen fertilizers. Overuse of the chemical nitrogen fertilizers by agricultural corporations and farmers is considered to be a major aggravator of marine ecosystems. Reducing and limiting their use is crucial to maintaining soil fertility and crop stability. The more nitrogen fixing bacteria in the soil, the less chemical nitrogen fertilizer needs to be applied to the plants. One of the uses of our research could be to identify the soil types favored by nitrogen fixing prokaryotes. We are working to identify and quantify the bacteria living in soil of varying pore sizes. By determining where the more nitrogen dense species live, we could be able to deliberately choose certain soils for farms and greenhouses. This will result in more nitrogen for the plants and farmers will be able to use less chemical nitrogen fertilizers. To identify actively growing bacteria, we adapted Ena Urbach's

technique based on immunocytochemistry to selectively isolate DNA from bacteria by incorporating bromodeoxyuridine (BrdU), a thymidine analog, into their DNA. We call this BrdU immunocapture. With prolonged monitoring of the bacteria in the soil, and reduced use of the fertilizers, far less damage will be induced to ecosystems worldwide. This will be the basis of my poster presentation.

OCCURRENCE OF COLIPHAGE AND SALMONELLA PHAGE ON ROMAINE LETTUCE TO INDICATE FECAL CONTAMINATION
Olivia Stenzel
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 363
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Rebecca Ives (Fisheries and Wildlife), Joan Rose (Fisheries and Wildlife)

The CDC reports 48 million cases of foodborne illness annually in the United States and approximately 46% of cases can be traced back to produce. A common cause of foodborne illness results from enteric pathogens and fecal contamination on produce. Bacteriophage, a type of virus that infects and is dependent on bacteria, are commonly used as fecal contamination indicators. The purpose of this study was to determine the occurrence of recent fecal contamination using phage on lettuce from the distributor and grocery store and also to determine if the contamination varied between inner and outer lettuce leaves. Three heads of romaine lettuce were sampled from two locations after harvest, a food chain distribution center and grocery store. Samples were tested for F-specific coliphage and Salmonella phage with the hosts Escherichia coli and Salmonella typhimurium respectively. Lettuce samples underwent an initial elution followed by a double agar overlay in a modified version of EPA method 1602, and an enrichment using a modified version of EPA method 1601. One out six heads tested positive for phage from the distribution center resulting in 5 MPN/g wet weight. All other inner and outer leaves from the distribution center and grocery store were negative for any cultivable phage. Results suggest minimal fecal contamination and that the phage were inactivated by the time the lettuce reached the grocery store. More samples and analyses are needed and also a survival study of phage on lettuce to provide insight into inactivation of viruses on lettuce.

POSTER PRESENTATIONS, SECTION 2
MOSAIC MULTIPURPOSE ROOM, 9:00-11:00 AM

ATM AND DNA-PK COOPERATE TO RESTRICT VDJ SIGNAL END REPAIR TO THE C-NHEJ PATHWAY
Caleb Bailie
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 365
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Katheryn Meek (Pathobiology and Diagnostic Investigation)

Developing lymphocytes have a virtually never-ending range of possible antigen receptors for both immunoglobulins and T cell receptors. This profound diversity of antigen receptors is due in large part to a gene recombination mechanism known as VDJ recombination. At the beginning of VDJ recombination, DNA double strand breaks (DSBs) are introduced by the endonuclease complex encoded by Recombination Activating Gene 1 and 2 (RAG 1 and RAG 2). VDJ recombination “shuffles” gene segments that encode immune receptors, resulting in many more unique receptors than what could “fit” into our genome if each were encoded by a unique gene. Current data suggest (although proof has been elusive) that the RAG complex interacts with other factors (ATM and DNA-PKcs) that restrict the repair of DSBs to the classical non-homologous end joining (c-NHEJ) pathway, as opposed to other repair pathways. It is thought that this interaction and subsequent pathway control is influenced by the phosphorylation of the RAG complex via ATM and DNA-PKcs. To further explore the possibility that ATM and RAG cooperate to restrict DSBs to c-NHEJ, we evaluated the effects of RAG mutations on gene recombination. RAG 2 vectors were mutated at conserved potential phosphorylation target sites for ATM or DNA-PKcs and transfected into mammalian cell lines. Our results suggest that ATM and/or DNA-PKcs play a critical role in repair pathway selection of DSBs that occurs during VDJ recombination.

ANTIBIOTIC AND IMMUNE SYSTEM PERSISTENCE IN GROUP B STREPTOCOCCUS
Clare Laut
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 366
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

Present as a commensal in the genitourinary tract of humans, Group B Streptococcus (GBS) is responsible for the majority of neonatal meningitis and sepsis cases. Therefore, identification of bacterial factors driving pathogenesis remains a public health concern. Multilocus sequence typing has identified phylogenetically distinct lineages associated with human colonization and disease, such as ST-12 and ST-17, respectively; however the underlying differences affecting outcomes remain obscured. One

hypothesis is that GBS can cause disease through immune system evasion. GBS has also been shown to cause persistent colonization after antibiotic treatment in clinical cases. A second study showed that antibiotic presence enhanced the phagocytic uptake of bacteria by macrophages, suggesting that it may drive microbes into immune cells as a survival mechanism. Our lab has shown that a ST-17 strain has increased uptake and intracellular survival in macrophages relative to a ST-12 strain. To assess the ability of the ST-17 and ST-12 strains to persist after ampicillin exposure, an antibiotic persistence protocol was developed to compare uptake by macrophages in the presence of ampicillin. The ST-17 strain was susceptible to killing by ampicillin while the ST-12 strain survived. Notably, the ST-17 strain was more readily phagocytized by macrophages in the presence of ampicillin whereas the ST-12 strain was not affected. Together the persistence and macrophage uptake results provide insight into the ability of GBS to persist within the human environment and cause infection after antibiotic treatment and immune system attack.

GROUP B STREPTOCOCCUS CAPSULAR POLYSACCHARIDE DISTRIBUTION IN NIGERIA
Jessica Plemmons
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 367
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

Group B streptococcus (GBS) is a leading cause of sepsis and meningitis in neonates and is an emerging pathogen in immuno-compromised adults. GBS asymptomatically colonizes the lower GI and vaginal tracts of healthy women and vertical transmission to neonates during labor can result in colonization and/or invasive disease. Restriction fragment length polymorphism (RFLP) analysis has identified ten capsule types, Ia, Ib, and II-VIII, associated with carriage and disease. Specifically, capsule type III is the most virulent invasive capsule type whereas capsule type V is an emerging capsule type seen recently in colonizing strains. This study used a polymerase chain reaction to amplify the capsule operon and RFLP analysis to characterize 281 Nigerian isolates to determine distribution of capsule types. Capsule type V was found to be most common and capsule type II, III, Ia, Ib, and IV follow in distribution. Understanding the distribution of capsule types allows targeted therapeutic intervention to those populations at highest risk of developing invasive disease. Future work will determine linkage between mother and baby pairs to identify capsule type(s) with increased probability of vertical transmission resulting in a more complete understanding of the emergence, prevalence, transmission of GBS.

IDENTIFICATION OF NOVEL C-DI-GMP DEPENDENT TRANSCRIPTION FACTORS
Jennifer Nyberg
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 368
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Christopher Waters (Microbiology and Molecular Genetics)

Cyclic-di-GMP (c-di-GMP) is a second messenger molecule that induces biofilm formation and represses motility in bacteria. Biofilms are highly tolerant to antibiotics and are a widespread medical problem, such as in diabetic foot ulcers and on artificial surfaces like hip replacements. It is important to understand the mechanisms that induce biofilm formation to determine how to best treat them. This research project seeks to understand how c-di-GMP controls transcription in the pathogen Vibrio cholerae by identifying the molecular mechanisms that control tag, a gene encoding a DNA repair enzyme in V. cholerae that is induced by c-di-GMP. We hypothesize that a novel transcription factor regulates tag in a c-di-GMP dependent manner. To identify this molecular mechanism, I am performing a genetic screen to isolate transposon mutants of V. cholerae that no longer show an induction of a tag-lux transcriptional fusion at high levels of c-di-GMP. The location of the transposon in those mutants will be identified by isolating the transposon and flanking genomic DNA followed by DNA sequencing. I have screened approximately 5,000 transposon mutants and identified seven that exhibit loss of tag-lux induction. One of the mutants, 14:C11, has been mapped to the hypothetical gene of unknown function, VCA0334. I am now determining the locations of the other six transposon mutants within the V. cholerae genome. Biofilms continue to be a serious medical problem. As c-di-GMP is critical for biofilm formation in 80% of bacteria, inhibiting c-di-GMP signaling may be a powerful new approach to inhibit biofilm-based infections.

EFFECTS OF HUMANIZED AND CONVENTIONAL MICROBIOTA ON HOST RESPONSE TO CAMPYLOBACTER JEJUNI IN NON-OBESE DIABETIC MICE
Alexander Ethridge
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 369
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Linda Mansfield (Large Animal Clinical Sciences)

The microbiota plays a fundamental role in the regulation of the host immune system. The host immune system in return

tolerates the established microbiota. Inflammatory disorders are known to be prevalent in hosts that lack diversity in their microbiota. Campylobacter jejuni, a pathogenic bacteria, is a leading cause of foodborne enteritis and is linked to the autoimmune neuropathy, Guillain Barré syndrome (GBS). Molecular mimicry between lipooligosaccharides of C. jejuni and the gangliosides found on peripheral nerves is thought to be a triggering mechanism for GBS. Our objective was to vary the microbiota of mice before exposure to C. jejuni to examine whether this would modulate the host immune response. Non-obese diabetic wild type (NODWT) mice were derived germ-free via cesarean implantation and thereafter gavaged with a human associated microbiota sample to establish NODWT mice with a humanized microbiota (HuNODWT). HuNODWT mice and NODWT mice with conventional microbiota (ConNODWT) were infected with two different strains of C. jejuni 11168 and 260.94, enteritis-associated and GBS-associated respectively. HuNODWT and ConNODWT mice were colonized in the colon and cecum by C. jejuni. Host immune responses to C. jejuni and nerve gangliosides were measured by an indirect enzyme linked immunosorbent assay. HuNODWT mice displayed elevated C. jejuni-specific IgG1, IgG2b and IgG3 antibodies compared to the ConNODWT for each strain used. ConNODWT mice displayed higher ganglioside-specific IgG1 antibodies compared to HuNODWT for each strain used. To determine differences in structure and diversity, the host microbiota will be sequenced using 16S rRNA sequencing.

ELUCIDATING THE CODING CAPACITY OF A TWO-COMPONENT GENETIC SYSTEM IN THE MITOCHONDRIA OF TRYPANOSOMA BRUCEI
Joshua Foster
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 370
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Donna Koslowsky (Microbiology and Molecular Genetics)

T. brucei is the parasite responsible for Trypanosomasis (Sleeping Sickness), a disease threatening ~60 million humans annually. T. brucei has a dual life-cycle; a bloodstream stage in mammals and a procyclic stage in the Tsetse fly. When transitioning between these stages the trypanosome undergoes substantive metabolic changes. These changes are regulated, in part, through RNA editing mediated by mitochondrial-encoded guide RNAs (gRNAs). In trypanosomes, RNA editing involves extensive gRNA-directed uridylate insertions and deletions in the mitochondrial mRNAs. Analysis of the gRNA transcriptome identified regions with low gRNA coverage for NADH dehydrogenase subunit 3 (ND3). We hypothesized that this region has sequence variations and is edited by unidentified alternative gRNAs. To test this hypothesis, we re-sequenced this region of the ND3 mRNA. Sequence from 22 clones identified multiple alternative sequences. Using these sequences, a search of our gRNA database identified candidate gRNAs that could guide the generation of one of the alternative sequences. This is the first report that primary transcripts can be edited along different pathways using different sets of gRNAs. Currently, we are using directed PCR to determine if the alternative sequence extends to the 5' end of the transcript. Once the fully alternatively edited sequence is identified it will be computationally analyzed to identify possible protein function.

CMIEAS
Bhavik Patel
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 371
Location: Mosaic Multipurpose Room
Time: 9:00 AM-11:00 AM
Mentor(s): Frank Dazzo (Microbiology and Molecular Genetics)

A major challenge in microbial ecology is to develop computing tools that can extract ecologically important information from digital images of microbial populations at single cell resolution. Several microbial ecologists and computer scientists have addressed this challenge by developing CMEIAS (Center for Microbial Ecology Image Analysis System). My responsibility is to use CMEIAS for image analysis and classification of microbial communities such as the nearby river. Using the advanced technology I can classify organisms into their morphotypes by CMEIAS analyzing every aspect of the image.

POSTER PRESENTATIONS, SECTION 3
BALLROOM, 1:00-3:00 PM

GENE DELETION OF MXAN_7312, A LYSR-FAMILY TRANSCRIPTIONAL REGULATOR CAUSES IRREGULAR FRUITING BODY FORMATION AND MILD MOTILITY DEFECTS IN MYXOCOCCUS XANTHUS
Michael Bowe
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 374
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Poorna Viswanathan (Microbiology and Molecular Genetics)

Myxococcus xanthus is a gram-negative bacteria that is used as a model organism to study cell to cell communication, and

developmental biology due to it's wolf-pack life behavior to feed on lower organisms, and it's ability to form multicellular fruiting bodies during times of starvation. LadA was the first LysR-type transcriptional regulator (LTTR) reported to be important the transcription of the dev operon, which is essential for normal development of the species. M. xanthus genome has 25 genes that are annotated as LTTRs. In my study, I found that a deletion of one of the LTTRs designated as MXAN_7312, caused subtle developmental and physiological differences compared to wild-type strain DK1622, including irregular fruiting body shape, and defects in both A-motility and S-motility.

BILE-MEDIATED REPRESSION OF VC1295 THROUGH THE VIRULENCE TRANSCRIPTION FACTOR TOXR OF VIBRIO CHOLERAE
John Shook
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 375
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Christopher Waters (Microbiology and Molecular Genetics)

Vibrio cholerae is a water borne enteric pathogen that causes the disease cholera. V. cholerae's ability to live in changing environments ranging from the aquatic environment to a human host requires many different signaling pathways. One of the major intracellular signaling molecules is the second messenger cyclic dimeric guanosine monophosphate (c-di-GMP) which is responsible for many behaviors including biofilm formation, motility, and virulence. C-di-GMP is synthesized by enzymes that have diguanylate cyclase activity; it is degraded by enzymes with phosphodiesterase (PDE) activity. Bile is a major signal in the human host that controls c-di-GMP. Recently, the Waters lab showed that bile increases c-di-GMP in V. cholerae partially through transcriptional repression of a PDE VC1295. Evidence suggests that the virulence transcriptional activator ToxR represses VC1295 in the presence of human bile. Putative ToxR DNA binding sites in the promoter region of VC1295 were predicted and transcriptional fusions indicate these binding sites are important in bile-mediated repression. To further support our hypothesis, the bile-mediated repression is lost in a ToxR mutant. Results suggest that ToxR is modulating the expression of VC1295, connecting bile, virulence regulation, and c-di-GMP during infection of V. cholerae.

ANTIGANGLIOSIDE IGG AUTOANTIBODIES IN PERIPHERAL NERVES OF C. JEJUNI INFECTED MICE
Christopher Bejcek
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 376
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Linda Mansfield (Microbiology and Molecular Genetics)

Guillian-Barre Syndrome (GBS) is an autoimmune disease that impacts the peripheral nerves and has been associated with Campylobacter jejuni infection. After eradication of polio, GBS became the world's leading cause of acute neuromuscular paralysis and can be fatal. However, little is known about the mechanism by which the immune system targets the nerves in response to infection. Previous studies of patients with GBS have suggested that anti-ganglioside IgG antibodies are associated with this syndrome. We hypothesized that there will be anti-ganglioside IgG autoantibodies found in nerves of C. jejuni infected mice but not in uninfected mice. Mice were infected with C. jejuni strains (260.94 and HB93-13) isolated from GBS patients. After infection, the mice were humanely euthanized and necropsies were performed. The sciatic and brachial plexus nerves were removed along with the dorsal root ganglions. Tissues were fixed and mounted onto slides. Immunohistochemistry was performed to detect the presence of autoantibodies towards IgG. As a result of being infected with C. jejuni, it is expected that these mice will exhibit higher levels of autoantibodies directed towards IgG in their nervous tissue compared to the controls and thus, be more prone to GBS. This information can be used as a platform for further research into the mechanisms of the nerve lesions in GBS. Understanding how nerve lesions form will eventually lead to specific treatments and therapies for those who develop GBS, along with preventative treatments for individuals infected with C. jejuni.

COLON ADENOMAS ARE ASSOCIATED WITH SPECIFIC LEVELS OF SATURATED AND CIS-TRANS MONOUNSATURATED FATTY ACIDS IN PLASMA PHOSPHOLIPIDS
Ami Lane-Elliot
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 377
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Jenifer Fenton (Food Science and Human Nutrition)

Obesity is associated with an increased risk of colon cancer. Pre-cancerous cell clusters known as adenomas increase the likelihood of colon cell carcinogenesis. Adenomas are linked to changes in signaling molecules including pro-inflammatory cytokines and lipid mediators. Our lab has recently shown obesity is associated with specific plasma lipid changes and altered lipid metabolism. However, it has not been determined if these changes are also associated with adenomas. This study aimed to establish relationships between saturated and monounsaturated fatty acids (MUFAs) in plasma phospholipids (PPLs) in individuals with colon adenomas. Previously collected plasma samples from 126 males ages 48 to 65 years were utilized for this

analysis. PPLs were isolated from extracted plasma samples. Fatty acid methyl esters (FAMEs) were prepared and separated using gas chromatography. The likelihood of incorporation of cis- and trans-MUFAs and saturated FAs into PPLs was assessed in males with colon adenomas in comparison to those without colon polyps. Odds ratios were calculated using polytomous logistic regression and adjusted for age and smoking. Participants with adenomas were less likely to have total saturated FAs and palmitic acid incorporation into PPLs. Estimates of ELOVL-6 and SCD n-7, enzymes responsible for elongation and desaturation of saturated FAs, were elevated in individuals with adenomas. One MUFA product from these enzymes, palmitoleic acid, was also elevated. Total trans-MUFAs and elaidic acid were more likely to be incorporated into the PPLs in participants with adenomas. Identifying biomarkers of colon polyps may decrease costs associated with screening and reduce colon cancer prevalence.

DETERMINING PATTERNS IN GENE ACTIVITY OF BIRDS INFECTED WITH AVIAN INFLUENZA
Catherine Hencsie
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 378
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Amanda Dolinski (Fisheries and Wildlife), Jen Owen (Fisheries and Wildlife)

Migrating birds play a key role in the rapid transmission of diseases. Avian Influenza occurs naturally in wild birds. It causes two main forms of disease distinguished by low and high extremes of virulence. The most common form found is the low pathogenic strain. There is a variable affect this disease has on the birds which depends on the bird's pathogenic load. Some shed the disease quickly while others die. We hypothesized that one's ability to shed a virus more efficiently than others relies intrinsically and extrinsically on the activity of a set of genes connected to the bird's immune response. We hatched 15 duck eggs. Between three and four months of age, the birds of the experimental group were infected with a low-pathogenic H7N3 virus. Cloacal swabs were taken before infection and at highest pathogenic state. From the cloacal swabs we will use plaque assays to determine viral load. RNA was also extracted from 10 organ tissues and sent for sequencing. In the near future, we will create expression profiles to identify genes that have been turned on/off due to the infection. This research will shed light on the genetics of resistance to avian Influenza. Currently, avian influenza is transmitted bird to bird. However, since the low pathogenic strains have a high mutation rate, there is concern that the virus could mutate into a unique high pathogenic strain. This strain could then potentially be carried by waterfowl and transmitted between humans.

GRK5 OVEREXPRESSION MODULATES LUNG EPITHELIAL CELL CYTOKINE EXPRESSION
Ian McCabe
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 379
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Nara Parameswaran (Physiology)

Mucosal surfaces in the body are lined by epithelial cells and provide a barrier between the microbial community and the body. When in contact with harmful bacteria, the epithelial barrier can generate a signaling cascade that promotes inflammatory pathways to counteract bacterial invasion. The goal of this project is to assess the role of G-protein coupled receptor kinase-5 (GRK5), a serine/threonine kinase in the lung epithelial response to bacterial products. To address this we overexpressed a lung epithelial cell line (A549) with wild type and mutant forms of GRK5. 48 hours following transfection cells were treated with heat-killed E. Coli bacteria. The cells underwent phosphor-protein analysis at 30 and 60 minutes after bacterial treatment. Cells were also harvested for RNA analysis (for cytokine mRNA expression) at 12 and 24 hours after treatment. Our results suggest that GRK5 is an important modulator of epithelial cell cytokine gene expression and this likely occurs via modulation of signaling pathways such as NFκB.

EFFECTS OF X-RAY DOSE RATE FOR INACTIVATING SALMONELLA IN FOODS
Philip Steinbrunner
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 380
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Sanghyup Jeong (Biosystems and Agricultural Engineering)

Pasteurizing food products to reduce pathogens is a crucial process in ensuring food safety. Traditionally, thermal inactivation of foodborne pathogens is very effective, but it requires heating which often affects the food's quality and cannot be applied to heat sensitive products. Meanwhile, non-thermal technologies, such as food irradiation using x-rays, electron beams, or gamma-rays, can inactivate bacteria within food without compromising its quality. Thus, the total doses necessary to reduce the bacteria to acceptable levels in various foods have been determined. However, previous experiments demonstrate that dose rate is a factor for the efficacy of ionizing radiation, which necessitates further understanding of bacterial inactivation kinetics as a function of dose rate and the energy level, and environmental factors. Therefore, the objective of this experiment is to

determine the effect of dose rate and energy level on the inactivation of Salmonella in various food products with varying water activity. For this, food samples will be inoculated with Salmonella, conditioned to a target water activity, irradiated with X-ray food irradiator, and enumerated for survivors. Thereafter, the bacterial survivor data will be analyzed to determine the efficacy of the dose rate and the energy level under various water activities. The outcome of this experiment will be a robust radiation lethality model as a function of dosage, dose rate, energy level, and environmental factors, such as water activity.

POSTER PRESENTATIONS, SECTION 4
BALLROOM, 1:00-3:00 PM

EFFECTS OF LONG TERM PROBIOTIC TREATMENT ON COLON INFLAMMATION IN HEALTHY FEMALE MICE
Shelby Atkinson
Category: Microbiology, Immunology, and Infectious Disease, Section 4
Poster: 383
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Laura McCabe (Physiology)

Recent studies have demonstrated that supplementation with probiotic bacteria can have beneficial effects for the host, including the relief of symptoms associated with inflammatory bowel diseases such as Crohn's disease and ulcerative colitis. While probiotic supplementation has been shown to have a positive effect in a pathological state, the long-term effects on the inflammatory status of the gastrointestinal tract in healthy individuals is not clear. The purpose of this study is to investigate the effects of long-term probiotic treatment on inflammation in the gut of healthy mice. To do this, healthy female mice, age 11 weeks, were treated with either Lactobacillus Reuteri 6475 or control broth for an 8 week period. We chose the probiotic strain of Lactobacillus reuteri because it has been suggested to make anti-inflammatory factors. After 8 weeks, we took a portion of the large intestine and isolated total RNA that was then converted to cDNA by RT-PCR. Expression of pro-inflammatory cytokines such as TNF-α, Il-1β, and Il-6, as well as anti-inflammatory cytokines Il-10 and Il-22, were analyzed by qPCR. Preliminary data suggest that L. reuteri may not alter inflammatory cytokine status in healthy female mice that are already at optimum pro and anti-cytokine balance. Understanding the effects of probiotic bacteria in healthy as well as diseased mouse models will allow us to better understand the potential mechanisms through which they exert their effect.

FE3O4@AU NANOPARTICLES: A NOVEL METHOD OF BACTERIAL CAPTURE
Jonathan Horton
Category: Microbiology, Immunology, and Infectious Disease, Section 4
Poster: 384
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Due to its pathogenic nature, E. coli O157:H7 needs precise monitoring; E. coli outbreaks are a threat to public health and are costly to the food industry. Bacterial detection is currently either inexpensive but slow, or rapid but expensive. We need a product that combines low cost and rapid results, while still efficiently capturing pathogenic E. coli. Using Fe3O4@Au nanoparticles can combine the cost-effectiveness and rapid capture of previous detection techniques and produce reliable results. These particles could allow more rigorous testing to be done more efficiently, reducing the likelihood of outbreaks of E. coli O157:H7. This project also looks into future developments for the nanoparticles, and related projects currently being examined in the lab.

DYNAMICS OF BIOFILM FORMATION IN ELIZABETHKINGIA ANOPHELIS
Samantha Hoyle
Category: Microbiology, Immunology, and Infectious Disease, Section 4
Poster: 385
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Shicheng Chen (Microbiology and Molecular Genetics), Edward Walker (Microbiology and Molecular Genetics)

Elizabethkingia anophelis bacteria dominate the microbial flora of the midguts of malaria vector mosquitoes Anopheles stephensi and Anopheles gambiae and may have important interactions with their mosquito hosts. We postulate that biofilm formation is one element of these interactions. We observed E. anophelis biofilm formation artificially and mutagenized using a transposon. Five different media were tested for biofilm formation and results showed that Tryptic Soy Broth (TSB) was the best medium to use. A biofilm assay involving crystal violet stain and optical density determination was adapted to E. anophelis and experiments were performed in triplicate on microtiter plates. Replicability with a broad range of wild type and mutant strains was found. Mutants with increased or decreased biofilm production were screened in TSB medium from at least 1000 conjugants with antibiotic resistance. 864 were tested for the biofilm assay and our preliminary results showed at least 7 mutants produced less biofilm and 2 mutants produced excessive biofilm. Further characterization of these mutants by

sequencing the transposon insertion and identifying the deficient genes will set the stage for further screening to determine the colonizing ability of mutants and the wild type in mosquitoes. This research will further our knowledge and understanding of biofilm formation in the insect gut. Ultimately, the research will be relevant to mosquito-bacteria-malaria parasite interactions.

THE BLACK QUEEN HYPOTHESIS IN TWO SPECIES OF E. COLI
Colleen Clark
Category: Microbiology, Immunology, and Infectious Disease, Section 4
Poster: 386
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Richard Lenski (Microbiology and Molecular Genetics), Jeff Morris (Microbiology and Molecular Genetics)

The Black Queen Hypothesis is a theory of reductive evolution that seeks to explain gain and loss of function of energetically expensive, leaky essential functions in bacterial communities. Due to some of the benefits of the leaky functions from the "helper" organisms that still perform it, the function then becomes available to the bacterial community as a whole. The loss-of-function mutants, or "cheaters", can survive and grow until the helpers are rare enough that their private access to the function balances the benefit gained by losing the function. In knowing that Black Queen helpers and cheaters can co-exist in an environment occupied by one species, we used two different deletions mutants of E. coli, classified as different species under the ecological species concept, in order to add more ecological complexity to the beginning of the experiment. One species was unable to utilize galactose as a carbon source, while the other species was not able to utilize mannose as a carbon source. Both species contained a plasmid that carried a gene for antibiotic resistance, the Black Queen function of this experiment. After the experiment had been carried out for five hundred generations, fourteen of the eighteen replicates had data suggesting that the plasmid was extinct in the mannose utilizing population, while also having a higher prevalence of galactose utilizers being the majority of detoxifying agents. Understanding the mechanism behind how communities lose and gain these functions has potential implications in topics such as antibiotic resistance and alternative biofuels.

DETERMINING THE EFFECTS OF PSEUDOMONAS AERUGINOSA BIOFILMS ON WOUND HEALING IN A DIABETIC MURINE MODEL
Jacob Gibson, Cassie Larrivee
Category: Microbiology, Immunology, and Infectious Disease, Section 4
Poster: 387
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Julia Busik (Physiology), Christopher Waters (Microbiology and Molecular Genetics)

Diabetes and obesity have reached epidemic proportions. According to 2011 CDC reports diabetes affects 25.8 million people, 8.3% of the U.S. population. It has been shown that those afflicted with diabetes have impaired wound healing leading to chronic wounds, many of which are untreatable and lead to tens of thousands of non-traumatic amputations annually. Bacterial biofilms have recently been implicated as an underlying cause of chronic non-healing wounds; however, the molecular mechanisms that are responsible for chronic wound formation and wound severity remain to be defined. Using a murine model, we are examining the impact of both extracellular and intracellular chemical signaling pathways in the ability of the bacterial pathogen Pseudomonas aeruginosa to cause chronic wounds. Our previous results indicated that uninfected diabetic wounds show delayed healing compared with wild type mice. To begin to assess the impact of biofilm formation, bioluminescent P. aeruginosa biofilms were transferred to the wounds of non-diabetic mice. The rate of healing and biofilm viability was then monitored via In Vivo Imaging System (IVIS) and microscopy until complete recovery. This experiment established that biofilm forming P. aeruginosa delay healing in a non-diabetic murine wound. We are currently examining the impact of biofilms in the diabetic murine model, and we expect to see an even greater delay in wound healing. Ultimately, specific mutations in chemical signaling known to regulate P. aeruginosa biofilm formation will be examined in these models, leading to a better understanding of molecular mechanisms that contribute to diabetic chronic wounds.

IMMUNE RESPONSES ASSOCIATED WITH MYCOBACTERIUM AVIUM SUBSPECIES PARATUBERCULOSIS (MAP) IN DAIRY COWS
Jenna Mitchell
Category: Microbiology, Immunology, and Infectious Disease, Section 4
Poster: 388
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Paul Coussens (Animal Science), Kelly Sporer (Animal Science)

Mycobacterium avium subspecies paratuberculosis (MAP) is an intracellular pathogen that is present in feces and the environment in which dairy cows live. MAP infection can lead to Johne's disease, a chronic infectious disease of ruminants that leads to persistent diarrhea, inappetence, and weight loss due to chronic inflammation of the small intestine, eventually resulting in death. Our lab's long-term objective is to identify immune phenotypes during MAP infection in cattle and that play a role in both susceptibility and resistance to Johne's disease. We hypothesize there will be a difference in the immune profile

between heifers and calves infected with MAP. Samples from three farms are collected and submitted to a commercial diagnostic testing center for Johne's disease (blood and milk) and environmental MAP (feces). Peripheral blood mononuclear cells are isolated from the blood of Johne's positive and Johne's negative individuals, treated with different stimulations, and immunostained for 10 different markers of various immune cell types. Cells are then subjected to flow cytometric analysis. By identifying immune responses related to susceptibility and resistance to Johne's disease we can then track calves as they enter the breeding herd. Johne's disease has a great economic cost to the dairy industry as well as being a serious issue for cow health and welfare. Our work will lead to new breeding strategies, therapies, diagnostics, and control measures to reduce the amount of Johne's cases.

POSTER PRESENTATIONS, SECTION 5
BALLROOM, 1:00-3:00 PM

REDUCTIONS OF DNA VS. RNA VIRUSES USING A MEMBRANE UV FILTRATION SYSTEM FOR WATER TREATMENT
Daniel Ginzburg
Category: Microbiology, Immunology, and Infectious Disease, Section 5
Poster: 391
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Joan Rose (Fisheries and Wildlife)

MS2 and P22 are two bacteriophage viruses. MS2 is a single stranded small RNA virus that is known to be resistant to UV. P22 is a larger double stranded DNA virus that has a small tail. These two viruses were selected to be used in a study of a new UV ceramic membrane filtration system used to treat water. This technique could be applied to clean the discharges of ballast water that ships transfer from port to port which mandated under new regulations. The objective of this study to investigate the reduction of two different viruses with this new filtration system in seeded experiment. A black box was setup that contained a UV lamp at the top. A pressure system using plastic tubing and a metal holder of virus was used to maintain a constant pressure of 7 PSI. The ceramic membrane was connected to the middle of this plastic tubing and coated with a catalyst. Water was spiked with high levels of the two bacteriophage and agar overlays were used to enumerate plaque forming units in the influent and effluent after which log reductions were calculated. The results demonstrated that MS2 and P22 were reduced by 3 and 4 logs, respectively. These data show that the use of this system could be applied in a full scale and prevent the spread of viral diseases transmitted through ballast waters.

VIRULENCE CHARACTERISTICS OF SHIGA-TOXIN PRODUCING ESCHERICHIA COLI RECOVERED IN MICHIGAN BETWEEN 2007-2014
Moriah Moore
Category: Microbiology, Immunology, and Infectious Disease, Section 5
Poster: 392
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

Escherichia coli is a bacterium that is found in the intestines of animals, including humans. Most strains of E. coli are relatively harmless. However, particular strains, namely O157:H7, are known to cause enteric disease. The purpose of this investigation is to determine how the E. coli population, recovered from sick patients in Michigan, has changed over time and whether certain virulence gene combinations are more common in individuals with disease. This study is important because E. coli is constantly evolving and new pathogenic strains are emerging in the population. From 2007-2014, 508 E. coli strains were received from the Michigan Community Health Department. The DNA of these strains was isolated and subjected to PCR amplification of virulence genes. The PCR products were electrophoresed to visually detect eae, stx1, and stx2/2c. PCR-based RFLP was utilized to differentiate between stx2 and stx2c. Of the 508 strains received, 273 of the strains were O157. To date, 141 of these O157 strains have been tested. Within this study, it was found that 99% (n=140) of the strains contained eae, 55% (n=78) stx1, and 100% (n=138) have had stx2/2c. In recent years, we have seen a reduction in O157 strains while the frequency of non-O157 serotypes is increasing. The most common of the non-O157 strains in our study was O45 with a frequency of 12% (n=63). Future work will focus on linking the virulence gene data to the epidemiological data to identity strain characteristics that are more important for certain symptoms.

ESTROGEN DEFICIENCY CAUSES REGIONAL CHANGES IN INTESTINAL PRO-INFLAMMATORY CYTOKINE EXPRESSION IN MICE
Hayley Bierhalter
Category: Microbiology, Immunology, and Infectious Disease, Section 5
Poster: 393
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Laura McCabe (Physiology)

Osteoporosis is the leading cause of bone fractures in women over the age of 50 and can result from diseases in the gastrointestinal tract, i.e., inflammatory bowel disease. Data from my previous research and others in the lab suggest that menopause, a key risk factor for osteoporosis, adversely alters colon pathophysiology. Whether changes caused by menopause-induced inflammation are constant along the entire gastrointestinal tract is unknown. We hypothesized that estrogen deficiency leads to changes in intestinal inflammation and histological structure, which are comparable across the regions of the intestinal tract. To examine changes in the intestinal epithelium after estrogen deficiency, 11 week old mice were ovariectomized (OVX) and analyzed 8 weeks later. Bone loss was confirmed by micro computed tomography (μCT). Portions of the intestines were taken for histology and mRNA analysis. For histology, the sections were stained with haematoxylin and eosin and visualized by microscopy. Measures of general intestinal pathology indicated that estrogen deficiency caused no major histological changes. In contrast, OVX significantly affected expression of pro-inflammatory cytokines as quantified by qPCR. OVX increased expression of IL-1β in the jejunum but significantly decreased expression in the colon. In contrast, OVX increased IFNγ expression throughout the intestines. These results demonstrate that estrogen deficiency can alter intestinal pro-inflammatory cytokine gene expression either broadly or regionally depending upon the cytokine. Understanding the mechanism causing these changes can help identify new therapeutic targets for improving intestinal health and potentially bone health in post-menopausal women.

STABILITY OF INFLUENZA VIRUS IN A NEW VACCINE MODEL
Jenna Carter
Category: Microbiology, Immunology, and Infectious Disease, Section 5
Poster: 394
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Paul Coussens (Animal Science)

Influenza is a serious, yet commonly occurring infectious disease in animals and humans. Annually, there are over 200,000 hospitalizations nationwide for respiratory and heart condition illnesses associated with influenza virus infections. Prevention of illness caused by influenza is best achieved through vaccination. However, vaccine production using current egg-based methods would not effectively protect the population during a pandemic due to numerous limitations in timing and yield. Additionally, people with egg allergies cannot be vaccinated. A more rapid and flexible cell culture-derived vaccine production process is therefore desirable. We have developed a serum-free, immortalized chick embryo cell line, the PBS-12SF line, which allows replication of human and avian influenza viruses to high titers. Vaccine production processes require multiple passages of virus, so it must be proven that influenza viruses grown in PBS-12SF cells remain genetically stable through multiple passages. The hemagglutinin (HA) and neuraminidase (NA) genes are both important in influenza A virus function with sequences that are publicly available. We have successfully infected PBS-12SF cells with human H1N1 virus, harvested viral supernatants, extracted viral RNA, and performed cDNA synthesis. Polymerase chain reaction (PCR) was used to amplify HA and NA gene sequences from viral cDNA, and genes were cloned and sequenced. Sequences were analyzed using NCBI BLAST. Preliminary results suggest genetic stability of both genes through two passages. We are currently increasing the serial passage number up to 10 to ensure high viral stability. This research may improve influenza vaccine production, providing greater protection during a pandemic.

MAJOR STRUCTURES OF MOSQUITOES
Ted Supal
Category: Microbiology, Immunology, and Infectious Disease, Section 5
Poster: 395
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

Mosquitoes are insects responsible for transmitting numerous serious diseases such as malaria and encephalitis. Targeting a weakness in their structure could lead to a method to eradicate mosquitoes from disease prone areas which could save thousands, if not millions of lives. For my research, I will examine the various structures of mosquitoes including the eggs and the adult. A scanning electron microscope (SEM) will be used to study the mosquitoes at high magnification. Measurements will be taken of their various primary structures. In addition I will examine the major sensory organs which allow them to see and detect odors given off by prey. My detailed imaging of these structures could provide insight of how they function. This knowledge could lead to new strategies to limit mosquito populations and reduce the spread of the diseases they carry. The research is very important based on recent statistics that indicate 207 million people suffered from the disease caused by mosquitoes in 2012 and about 627,000 died.

NEW GENERATION EYE TREATMENT
Gabriel Stewart
Category: Microbiology, Immunology, and Infectious Disease, Section 5
Poster: 396

Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Andras Komaromy (Small Animal Clinical Sciences)

Glaucoma is an optic nerve disease and worldwide a leading cause of incurable blindness. The progressive vision loss is based on the death of retinal ganglion cells, which transmit visual information from the eye to the brain. Glaucoma is a multifactorial disease with family history and elevated pressure inside the eye (intraocular pressure, IOP) representing two main risk factors. Glaucoma is also a common cause of blindness in dogs, and our laboratory studies affected dogs as a disease model for human glaucoma. The most common form of glaucoma is primary open-angle glaucoma (POAG), a disease that we study in a unique family of spontaneously affected dogs. In these animals, POAG is caused by a mutation in the ADAMTS10 gene which leads to an abnormal composition of the extracellular matrix and impaired fluid drainage from the eye, resulting in increased IOP and subsequent optic nerve damage. The study of these dogs provides us with an exclusive opportunity to gain a better understanding of disease mechanisms and to develop new therapies that will benefit both human and dog patients. In our presentation we display our clinical observation of disease progression by long-term IOP measurements (tonometry) as well as in vivo high resolution imaging of optic nerve degeneration and impaired ocular blood flow. Furthermore, we present promising preliminary data of two new treatment strategies to lower IOP: gene therapy with recombinant adeno-associated virus and use of a novel intraocular implant for slow, long-term drug release.

NEUROSCIENCE

ORAL PRESENTATIONS, SECTION 1
LAKE SUPERIOR ROOM, 1:00-3:00 PM

CHARACTERIZATION OF NEUROTENSIN RECEPTOR-2 IN THE ROLE OF NEUROLOGICAL ENERGY BALANCE
Lindsey McQuade
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 1:00 PM-1:15 PM
Mentor(s): Gina Leinnger (Physiology), Hillary Woodworth (Physiology)

Neurotensin (Nts) is a neuropeptide produced in the brain and intestine that is implicated in regulating feeding, locomotor activity, learning and nociception. Neurotensin regulates cells expressing Neurotensin receptor-1 (NtsR1) or -2 (NtsR2), but the lack of comprehensive methods to identify and manipulate Nts-responsive cells in the body has limited our understanding of Nts action. Using cre-lox technology, our lab generated a knock-in mouse that selectively identifies NtsR2 neurons that can be visualized via immunofluorescent microscopy. Using these mice we have begun to analyze which cells throughout the brain express NtsR2. We observe NtsR2 neurons within the ventrolateral periaqueductal grey (VLPAG) and the ventral tegmental area (VTA), regions important for nociception and motivated behaviors, respectively. We also found a very large population of NtsR2 neurons within the hippocampus, a region important in the regulation of learning and memory. These findings prompted us to inquire what types of cells these NtsR2 neurons were labeling, specifically in the hippocampus. Using immunofluorescence microscopy we determined that at least some of the NtsR2-expressing neurons in hippocampus may be newly generated neural progenitor cells, which ultimately mature into adult granular cells. Going forward, we will continue to use this model to selectively interrogate the role of Nts action via NtsR2 in these brain populations.

INFORMATION-THEORETIC ESTIMATION OF DYNAMIC EFFECTIVE CONNECTIVITY
Samuel Akwei-Sekyere
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 1:15 PM-1:30 PM
Mentor(s): Mark Reimers (Neuroscience)

Unravelling the mechanisms of neural information processing is one of the grand challenges in modern neuroscience. Although the brain is composed of discrete structures that process information in a binary fashion, the ability of neurons to communicate with one another in a convoluted network, for the manifestation of complex behaviors, makes the characterization of neural systems is quite elusive. A possible approach to elucidate neural information processing is the estimation of the structure of the networks involved in a specific task. Many researchers have proposed viable techniques for inferring how the activity of one neuron influences the other. Others have also devised methods that are appropriate for non-binary signals. However, due to the high correlation of intra-cranial local field potentials, estimating connectivity between nearby spatial neighborhoods of the brain is relatively difficult and has been least explored. In this presentation, I propose a framework with which connectivity between brain regions can be estimated from intra-cranial local field potential recordings. In contrast to existing methods of connectivity, I demonstrate that this approach is void of the need to add artificial time lags to infer causality; time lags are added dynamically by an unsupervised machine learning algorithm. This approach utilizes concepts in information theory and signal processing. The method will be useful in understanding how ensembles of neurons within a spatial neighborhood of the brain interact to

give rise to an observed behavior. It also has clinical applications in the surgical treatment of neurological disorders such as Parkinson's disease and dystonia.

LITERARY NEUROSCIENCE: ATTENTION AND READING IN JANE AUSTEN'S "MANSFIELD PARK"
Mohan Gupta, Truman Silvasi
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 1:30 PM-1:45 PM
Mentor(s): Natalie Phillips (English)

Previous research has examined how semantics of short sentences affect neural networks in the human brain. The Digital Humanities and Literary Cognition lab is seeking to discern how different modes of attention in natural reading activate the brain. This experiment had two conditions: analytical close reading and casual pleasure reading. PhD candidates in English (N = 18) were instructed to read the second chapter of Jane Austen's Mansfield Park in an MRI scanner, where functional brain activity data was collected. The stimulus was presented in 32 blocks of text, alternating every 8 blocks between the close and pleasure conditions. It was found that the two conditions activate the same anatomical brain regions. We observed bilateral activation of the occipital and temporal lobes and unilateral activation of the frontal lobe. Our next step is to determine which condition yielded greater activation in each of these regions. Understanding which brain regions are more active in each condition could provide insight in how different modes of attention affect neural activity.

THE DIFFERENCE BETWEEN MALE AND FEMALE BRAINS
Rebecca Waineo, Erica Ause, Cathryn Chapa
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 1:45 PM-2:00 PM
Mentor(s): Terri Barry (Writing, Rhetoric, and American Cultures)

It is obvious to the naked eye that males and females have various physical differences; however, what are not obvious are the differences between genders' brains that cause males and females to think and act differently. Over time, scientists have conducted research to find how the two brains differ. Different parts of the brain, such as the amygdala, help explain particular phenomena such as sex drive, facial recognition and memories. The plasticity of the brain, as well as different levels of testosterone and estrogen, result in several behavior patterns over time. These different levels of hormones impact neurotransmitters in the brain, and result in different outcomes, which are important in determining treatment for neuropsychiatric disorders and seizures. An increase in testosterone may be one reason that male brains are physically larger than females. Scientists also explain size disparity in separate structures of the brain, gray and white matter, and different fluctuations of blood flow over time could contribute to social discrepancies between male and females. It is important to be aware of these differences because they play a large role in communication and provide the medical field with an enhanced understanding of how to prescribe and properly diagnose their patients.

THE ROLE OF SIRTUIN-3 IN THE ENTERIC NERVOUS SYSTEM
Rebecca Bubenheimer
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 2:00 PM-2:15 PM
Mentor(s): Brian Gulbransen (Physiology)

Sirtuin-3 (SIRT3) is a histone deacetylase that regulates oxidative stress in the brain, kidney and liver. Oxidative stress contributes to neuroinflammation in the enteric nervous system (ENS) and enteric neuron loss contributes to gut motility disorders. Our preliminary data show that enteric neurons express SIRT3. We tested the hypothesis that SIRT3 is required for enteric neuron survival during inflammation. We compared the effects of dinitrobenzenesulfonic acid (DNBS) colitis on enteric neuron survival in mice with a genetic ablation of SIRT3 (SIRT3-KO) and wild type controls. We assessed neurochemical coding with immunohistochemistry for neuron specific antibodies against HuC/D, calretinin and nitric oxide synthase (nNos) (general, excitatory, inhibitory neuron makers respectively). Data was analyzed using a two way ANOVA. DNBS colitis decreased the packing density of the neurons by 31% ($p<0.01$) and 26% ($p<0.05$) in wild type and KO tissue respectively. DNBS-colitis did not alter the percent of Hu neurons that are also positive for calretinin ($p>0.05$). DNBS-colitis did not alter the percent Hu neurons that are also positive for nNos ($p>0.05$). Our results suggest that while SIRT3 contributes to the control of oxidative stress in enteric neurons, the loss of SIRT3 does not significantly contribute to inflammatory neuropathy in the gut.

MOTOR CONTROL IN CLINICAL POPULATIONS: TRANSFEMORAL AMPUTATIONS
Chiadika Nwanze
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 2:15 PM-2:30 PM
Mentor(s): Annette Pantall (Osteopathic Manipulative Medicine)

Slope walking is associated with increased instability particularly in the mediolateral plane and thus a greater risk of falling for all age groups. To compensate for this instability, motor units employ different task-specific strategies. A previous study (Lay et al., 2007) reported slope specific changes in EMG amplitude of 8 lower limb muscles. Slope dependent frequency changes have also been reported in a feline model (Hodson-Tole et al. 2012) which may indicate patterns of motor unit recruitment, with lower frequencies corresponding to smaller motor units. This study investigated intensity and frequency of human surface electromyography (EMG) in seven proximal lower limb muscles when walking on level and inclined surfaces (5^{o}). It was hypothesized that different patterns of EMG frequency would be observed for downslope, level and upslope walking. Furthermore, due to the increased instability associated with slope walking, it was expected that there would be a higher variability in EMG amplitude during slope walking especially for muscles in the mediolateral plane (adductor magnus (AM) & tensor fasciae latae). All muscles showed significant differences from level to slope walking for both frequency and intensity. Frequency was greatest for upslope at the beginning of stance which generally corresponded with greatest intensity. Repeatability in activation patterns across muscles was lowest for downslope walking and across all conditions was lowest for AM. Results indicate different motor programs are used for slope walking and there is higher stability in motor control during level and upslope walking compared to downslope walking.

TO STING OR NOT TO STING? ANALYSIS OF CROSS-SPECIES AND CROSS-SEX STINGING DEFENSIVE BEHAVIOR IN SCORPIONS.
Dylan Miller
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 2:30 PM-2:45 PM
Mentor(s): Ashlee Rowe (Zoology)

Little is known about scorpions, and less known about their stinging behavior-perhaps one of the most recognizable aspects of a scorpion. Previous studies on scorpions have indicated that receiving direct tactile stimulation to their legs induces defensive behavior-either stinging or snapping with their pedipalps in the perceived direction of the stimulation, or movement away from the perceived stimulus. In this study, different species of scorpions had their defensive responses invoked and examined. The scorpion surgery includes interfacing wire electrodes with the leg nerves, which are then paired with a function generator. The scorpions received 2.5 V of 55 Hz AC for 150 ms, at differing legs, and their resultant behavior relative to the point of stimulation was recorded. The prediction was that those scorpions with thicker pedipalps will reliably sting or claw to the side the electrical stimulation is provided, and those with thinner pedipalps. Then, within the species C. vittatus, there is a sexual dimorphism with males having longer, thinner tails, and showing a dramatically reduced amount of stinging in defensive situations. This previous data was confirmed with the standardized task of electrical stimulation. As well, using a venom volume quantification assay and looking at differences in venom content, differences between the quality and quantity of venom components was analyzed between the sexes, and combined with the species difference data, a better understanding of why scorpions select to sting defensively was reached.

INFLUENCE OF READING TIMES ON QUOTING REFERENCES
Jasdeep Bathla, Phil Dooley
Category: Neuroscience, Section 1
Location: Lake Superior Room
Time: 2:45 PM-3:00 PM
Mentor(s): Natalie Phillips (English)

Reading and comprehension involves the collaboration of multiple neural networks. While many studies have analyzed the basic brain functions involved in comprehending words and simple sentences, none have looked at how the brain processes complex literature. The Digital Humanities and Literary Cognition Lab's grounding breaking work in literary neuroscience has pioneered research in understanding various methods of attention in reading. Eighteen English PhD candidates were put in an MRI machine and asked to read the second chapter of Jane Austen's Mansfield Park. The chapter was divided into smaller "blocks" in which the graduate students were asked either to read analytically (close reading), or for pleasure. After, participants were asked to write a short essay on the sections they had "close" read for detail. Upon reviewing these essays, one aspect of particular interest was that a majority of subjects accurately quoted, either intentionally or unintentionally, various portions of the text. Furthermore, the length of reading time for each block was different depending on the participant. Now, we have begun analysis of the reading time data and are examining why the participants read different blocks faster or slower than other others. Analysis of reading time data may reveal a relationship between the reading time for a block and the amount of times a participant quoted from it, or a relationship to the literary elements of the text. By correlating data collected through essay writing with neural data from subjects, this study aims to further our understanding of how we comprehend literature.

POSTER PRESENTATIONS, SECTION 1
BALLROOM, 9:00-11:00 AM

IDENTIFYING NEUROTENSIN-REGULATED NEURONS IN THE LATERAL HYPOTHALAMIC AREA OF THE BRAIN: A POTENTIAL MECHANISM TO SUPPRESS FEEDING
Trevor Lewis
Category: Neuroscience, Section 1
Poster: 399
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Gina Leinninger (Physiology), Hillary Woodworth (Physiology)

The lateral hypothalamic area (LHA) contains distinct populations of neurons that either promote or suppress feeding behavior. For example, neurons that express either melanin concentrating hormone (MCH) or Orexin (OX) promote feeding. In contrast, our lab has identified a separate population of LHA neurons that express neurotensin (Nts), a neuropeptide that suppresses feeding. LHA Nts neurons synapse onto OX neurons and suppress their activity, which may be part of how Nts limits feeding. We hypothesize that if OX neurons are regulated by Nts they must express at least one of the receptor isoforms for Nts, neurotensin receptor-1 (NtsR1) and/or -2 (NtsR2). To investigate this hypothesis we generated mice expressing green fluorescent protein (GFP) in either NtsR1 cells ($NtsR1^{GFP}$ mice) or in NtsR2 cells ($NtsR2^{GFP}$ mice), permitting their visualization via immunfluorescent microscopy. Analysis of these mice reveals few NtsR2-expressing neurons in the LHA, but many LHA neurons express NtsR1. We are currently using these mouse models and co-immunofluorescent microscopy to determine if OX neurons express NtsR1 and/or NtsR2. Further, we are assessing whether NtsR1 and/or NtsR2 neurons in the LHA are regulated by hormonal cues that suppress feeding, such as leptin. These studies will suggest a signaling mechanism by which LHA Nts neurons suppress OX neurons and feeding, and may suggest how LHA neural circuits are disrupted in eating disorders.

PEPPERMINT IS THE NEW VANILLA: CHANGING OLFACTORY PREFERENCES THROUGH OPERANT CONDITIONING IN COCKROACHES
Alexander Clark
Category: Neuroscience, Section 1
Poster: 400
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Greg Gage (Neuroscience)

All cockroaches are capable of detecting odors through their antennae; it has been observed that roaches can be operantly conditioned to show a preference for a peppermint odor, which they are naturally averse to, over a vanilla scent and the memories of this preference were retained for up to a month. The goal of this research is to observe the behavior of the cockroach's natural tendencies and ability to be trained while using cost-effective materials and methods to use in classrooms around the world. The cockroaches are tested of their preference of peppermint and vanilla at the beginning of the experiment and after training sessions have taken place. Training is conducted in order to have the cockroaches prefer the scent of peppermint over vanilla. This experiment is an important illustration of the plasticity of memory; by using an animal model, we can begin to better understand how memory is created and retained. Understanding memory and retention is important to learning about the function of neurons and the brain or ganglion of various organisms.

INDUCTION OF ΔFOSB FOLLOWING PHYSICAL AND EMOTIONAL STRESS
Megan Kechner
Category: Neuroscience, Section 1
Poster: 401
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Michelle Mazei-Robison (Neuroscience)

Expression of the transcription factor ΔFosB is altered in depression and is known to play an important role in mediating responses to stress. Social defeat stress (SDS), an ethologically valid rodent model that utilizes the physical and psychological stress imposed by social subordination, exhibits excellent face and pharmacological validity for stress-related disorders like depression. However, SDS utilizes physical trauma, complicating the study of pain-relieving opiate drugs. Given our interest in the comorbidity of opiate abuse and depression, we have utilized the recently developed model of emotional stress to overcome this issue. With emotional stress, mice witness, but are not physically exposed to, chronic SDS (CSDS). Exposure to physical CSDS has been shown to promote differences in ΔFosB induction in multiple brain regions, including the prefrontal cortex (PFC) and nucleus accumbens (NAc), that mediate the depression-like effects of social stress. Here, we sought to examine whether emotional stress elicited a similar pattern of ΔFosB induction to physical stress. Male, c57Bl6 mice were exposed to a daily ~5 minute physical or emotional encounter in the home cage of a CD1 aggressor mouse for 10 days as described previously (Warren et al., 2013). Mice were then perfused one hour following social interaction testing on day 11. We are now performing immunohistochemistry to assess induction of ΔFosB throughout the brain and predict that emotional and physical stress will induce ΔFosB in an overlapping subset of brain structures, thereby highlighting critical regions for intervention in future studies.

CHRONIC DRUG- AND STRESS-INDUCED BIOCHEMICAL CHANGES IN THE VENTRAL TEGMENTAL AREA
Rebecca Brunk
Category: Neuroscience, Section 1
Poster: 402
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Michelle Mazei-Robison (Neuroscience)

Stress is a well-established mediator of addictive behavior, and those that suffer from stress-related disorders such as depression and post-traumatic stress disorder are at increased risk of developing substance use disorders. Comorbidity of addiction and depression suggests a common underlying cause. We are particularly interested in whether biochemical changes in the ventral tegmental area (VTA), a key brain region for reward, may mediate addictive and depressive behaviors. I am focusing on the involvement of the mammalian target of rapamycin 2 (TORC2) pathway since opiate exposure alters the morphology of VTA dopamine neurons in a TORC2-dependent manner. Specifically, my goal is to identify molecules downstream of TORC2 that could mediate drug- and stress-induced changes in VTA dopamine neuron morphology. Recently it has been shown that TORC2 alters activity of the cytoskeleton modulatory protein Rac1 in the hippocampus. Thus, I am determining whether Rac1 signaling is altered in the VTA following chronic drug or stress exposure. We have microdissected the VTA from mice exposed to either chronic morphine or chronic social defeat stress, along with appropriate control mice. We are processing the samples for Western blot analysis, and I am assessing whether Rac1 levels, as well as phosphorylation of proteins in the Rac1 signaling pathway such as PAK1, are altered by drugs or stress,. The overall goal of my project is to identify molecules, such as Rac1, that may be critical for drug and stress adaptations, and could serve as novel points for therapeutic intervention in these devastating disorders.

UNSUPERVISED NOISE REMOVAL, SPIKE DETECTION AND SPIKE CLASSIFICATION: IMPLICATIONS FOR CLINICAL APPLICATIONS OF NEURAL INTERFACES
Samuel Akwei-Sekyere
Category: Neuroscience, Section 1
Poster: 403
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Mark Reimers (Neuroscience)

In order to understand brain function, it is imperative to obtain information about how the activity of individual neurons and that of a population influence observed patterns of behavior. Micro-electrode arrays implanted in the brain have been used to successfully acquire the information needed to elucidate neural phenomena. Nevertheless, abiotic noise often comes trailing along with the recorded neural signals. The presence of noise convolutes the analysis of the activity of neural ensembles, and in some cases, may result in the derivation of erroneous conclusions. Most often than not, the activity of individual neurons is sought after in order to understand how they integrate information to accomplish a specific task. Since the spatial bandwidth for each recording micro-electrode is quite broad, even after high-pass filtering, their respective signals often contain information about many different spiking neurons. In this presentation, I propose an approach inspired by artificial intelligence, which exploits biophysical and statistical properties of neural signals, with which abiotic noise can be extinguished and the activity of individual neurons within a population can be extracted. This framework will be useful by providing an enhancement to adaptive neural interfaces that interpret neural information and translate them into a language computers and machines can comprehend. By extension, clinical applications of these interfaces such as epilepsy detection during neurosurgery, body control via brain-machine interfaces and training neural stem cells for implantation and reparation are enhanced.

DEFINING THE RECEPTOR SITE OF SODIUM CHANNEL BLOCKER INSECTICIDES ON INSECT VOLTAGE-GATED SODIUM CHANNELS
Caitlyn Behnke
Category: Neuroscience, Section 1
Poster: 404
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Ke Dong (Entomology), Yoshiko Nomura (Entomology)

Voltage-gated sodium channels are essential for initiating and propagating action potential in neurons and other excitable cells. Several classes of insecticides target these channels to inhibit the critical role of sodium channels in electrical signaling. Sodium channel blocker insecticides (SCBIs) are one type of those insecticides, which block sodium ions from entering the cell. The specific binding site of the SCBIs on the sodium channel is still unknown. Local anesthetics (LA) have a similar mode of action on mammalian sodium channels; potentially SCBIs and LAs could share the same binding site on the sodium channel. The molecular determinants (i.e., amino acid residues) that are critical for LA binding have been identified. In this study, to determine whether LA-residues are also critical for the action of SCBIs. I conducted PCR-mediated site-directed mutagenesis and introduced LA-mutations into cockroach and mosquito sodium channels. The mutants were expressed in Xenopus laevis oocyte. Two-electrode voltage clamp technique was used to measure sodium currents and the inhibitory effect of SCBIs on the

currents. Our results show that several LA-binding residues are also critical for the action of SCBIs. These findings provided valuable information for computer modeling and further mutational analysis to define the molecular identity of the receptor site of SCBIs on the sodium channel.

RESEARCHING MELANIN CONCENTRATING HORMONE: IMPLICATIONS FOR FEEDING AND OBESITY
Ryan Gifford
Category: Neuroscience, Section 1
Poster: 405
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Alexander Johnson (Psychology)

The signboards, media advertisements and other stimuli that we are exposed to on a daily basis are oftentimes associated with food and may be triggering overeating behaviors. The hypothalamic signal Melanin Concentrating Hormone(MCH) may be contributing to the obesity epidemic as it modulates feeding and reward learning. To characterize the role of MCH in feeding behavior, we used a cue-potentiated feeding (CPF) paradigm in which mice were trained with one auditory cue (CS+) paired with sucrose reward, and a second distinct cue that was not (CS-). During the test stage, the CS+ (but not CS-) elicited overeating to the sucrose under sated conditions. To characterize MCH encoding of CPF, brain tissue from control B6 mice tested with either the CS+ or CS- was analyzed using immunofluorescent markers for MCH and the immediate early gene signal for neuronal activity–FOS. In a subsequent experiment, we examined the ability of CS+ to enhance the taste of less palatable outcomes using a mediated learning procedure. In this test, when presented with water rather than sucrose,a sucrose-associated CS+ evoked a hallucination as if the sucrose were presented. Preliminary findings suggest that optogenetic stimulation of MCH enhanced this 'hedonic hallucination' effect. This was achieved through the use of MCH-cre mice that were infected with a virus (AAV-ChETA), which subsequently enabled the stimulation of MCH neurons using laser light in awake behaving mice. These studies suggest that MCH plays a critical role in feeding behavior and may be a critical signal that influences obesity.

POSTER PRESENTATIONS, SECTION 2
BALLROOM, 9:00-11:00 AM

EFFICACY OF GENE TRANSFER USING ENGINEERED RECOMBINANT ADENO-ASSOCIATED VIRUS (RAAV) CAPSID MUTANTS
Ben Coberly
Category: Neuroscience, Section 2
Poster: 409
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Fredric Manfredsson (Translational Science and Molecular Medicine)

The use of rAAVs as viral vectors involves exploiting viruses' evolved abilities to infect cells to elicit a certain effect. As viruses have evolved to infect cells well, cells have evolved methods to resist infection. These involve phosphorylation of tyrosine and threonine residues on the viral capsid by kinases within target cells. This limits rAAV transduction efficiency and the study of gene therapies. It appears that AAV capsid mutants may be produced to prevent these interactions. In an attempt to improve AAV transduction efficiency, the ability of AAV2 and AAV8 capsid mutants to transduce rat striatal cells was studied. Surgeries were performed on 32 rats, each receiving a two uL striatal injection of an AAV capsid mutant per hemisphere. AAV2 and AAV8 wild-types were employed as control. AAV2 mutants included T2-QUAD-T491V and T2-TRIP-T491V viral vectors. AAV8 mutants included T8-Double, T8-Y773F, and T8-C&G-T494V viral vectors. These were engineered to produce green fluorescent (GFP) or red fluorescent protein (RFP) upon transduction. The rats were perfused, their brains sectioned and stained for GFP or RFP via immunohistochemistry. Stained cells were counted via stereology, producing an estimate of cells transduced and determining spread. LI-COR was employed to determine transgene expression. Except T8-Double, all AAV capsid mutants were more efficient at transducing striatial cells than the wild-types. The AAV8 wild-type and mutants were generally more effective at transduction than AAV2 wild-type and mutants. This suggests that capsid residue and target cell interactions were limited with the mutations' introduction to both AAV2 and AAV8 wild-type viruses.

REGENERATIVE ELECTRODE INTERFACE
Marissa Zoratti
Category: Neuroscience, Section 2
Poster: 410
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Erin Purcell (Engineering)

The limited longevity of implanted neural recording electrodes remains an unresolved issue that constrains the clinical utility of neuroprostheses. The local tissue response to implanted neural prostheses includes glial scarring and neuronal loss around the device; both of these outcomes impede communication between the device and the surrounding neurons. In addition to

neuronal loss around the device, there is currently no way to achieve cell-type specific recordings from implanted neural electrodes. We seek to regenerate the device interface with induced pluripotent stem cell (iPS)-derived neurons. This project will lay the groundwork for in vivo studies which seek to regenerate and prescribe the connectivity of electrode sites with local neuronal subpopulations. In the future, this could enable targeted recording of neuronal subtypes, yielding a powerful new experimental platform and clinical approach for closed-loop, cell type-specific neural interfaces.

DETERMINING NEUROPHYSIOLOGICAL MECHANISMS ASSOCIATED WITH TENDER REGIONS IN UPPER TRAPEZIUS--ASSESSMENT OF THE OPTIMAL ELECTRODE POSITION AND RATE OF CONTRACTION
Maizie Faber, Srividya Kakulavarapu
Category: Neuroscience, Section 2
Poster: 411
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Annette Pantall (Osteopathic Manipulative Medicine)

Many patients attend osteopathic clinics due to neck-pain. Tender zones (TZs) and tissue changes are frequently associated with neck pain. Diagnosis of TZs is dependent on subjective assessment. The goals of this project are to investigate objective diagnostic methods of TZs by analysis of electromyography (EMG) of upper trapezius (UT) during a range of shoulder movements. EMG parameters are dependent on many factors including electrode placement, force and speed of muscle contraction. Six EMG surface electrodes were placed across the UT; P1 at C3 spinal level, P2 at C5, and P3-6 supraclavicularly from medial to lateral. Participants performed maximum voluntary contractions (MVC) of UT through shoulder elevation against resistance. Isometric ramp contractions were performed with 20% increments of MVC. Participants then elevated and depressed their shoulders for a period of one minute at 0.5, 0.25, 0.167 and 0.125 Hz. Data was normalized to MVC and mean frequency was determined through wavelet analysis. For ramp contractions position had a signifiant affect on frequency. Correlation between intensity and force was high, but low between force and frequency. For isokinetic contractions, the highest correlation for frequency/intensity and angular elevation was for P4 and P6 at a rate of 0.125Hz. P3-6 had the highest signal to noise ratio. This data has identified the optimal positions of electrodes on the UT and optimal rate of cyclic movement necessary for a study including participants with neck-pain, which will enhance the understanding of the neurophysiological mechanisms responsible for the development of TZs in UT.

HIPPOCAMPAL NEUROGENESIS IN AN ANIMAL MODEL OF SEASONAL AFFECTIVE DISORDER
Nadia Chupka
Category: Neuroscience, Section 2
Poster: 412
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Lily Yan (Psychology)

Seasonal affective disorder (SAD) is a major depressive disorder associated with seasonal variations in the amount of environmental light. Though SAD currently affects over a half million people, the underlying mechanisms are not well understood. Clinical and preclinical studies have shown that hippocampal neurogenesis is impacted in depression. To identify whether neurogenesis is impaired in SAD, we utilized diurnal grass rats (Arvicanthis niloticus) housed in 12:12hr dim lighting conditions, an animal model of SAD. Grass rats housed in dim light DLD (winter-like lighting conditions) show depression-like behaviors compared to the control animals housed in bright light BLD (summer-like lighting conditions). After four weeks in the housing paradigm, rats were injected with 5-bromo-2-deoxyuridine (BrdU), a marker for cell proliferation, and their brains were analyzed 24 hours later. Using immunohistochemistry, sections were stained for BrdU to assess hippocampal neurogenesis. We found a significant difference in the amount of BrdU labeled cells between the BLD and DLD groups. These results contribute to further understanding of the neuropathology and etiology of SAD.

THE ACUTE EFFECTS OF LIGHT ON BEHAVIOR IN DIURNAL AND NOCTURNAL RODENTS: THE ROLE OF GALANIN-EXPRESSING CELLS WITHIN THE VENTROLATERAL PREOPTIC AREA (VLPO)
Ewelina Szewczuk
Category: Neuroscience, Section 2
Poster: 413
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Laura Smale (Psychology)

The overall amount of activity a mammal exhibits at any given time is heavily influenced by the environmental light and dark cycle. Diurnal mammals, such as grass rats (Arvicanthis niloticus), are aroused and active during daytime when light is present, while nocturnal animals, like the Long Evan's rat (LE rats; Rattus norvegicus), are active at night. Neural pathways contributing to acute effects of light on behavior in diurnal and nocturnal species are not well understood. One area that may play a role is the ventrolateral preoptic area (VLPO), a portion of the brain known to signal the onset of sleep. Neurons within the VLPO of sleeping rats contain significant amounts of cFos, a marker of neuronal activity, in their nuclei. A subpopulation of cells within

the VLPO also expresses one of the two major inhibitory neurotransmitters, galanin. Here we used immunohistochemistry (IHC) to double label for cFos and galanin in the brains of colchicine-treated grass rats and LE rats either collected on a control night or after a 1-hour light pulse at night. Specifically, we want to determine whether there is a difference with respect to the percentage of galanin cells expressing cFos on a control night (when LE rats are active and grass rats are asleep) and after a light pulse (induces sleep in LE rats and stimulates activity in grass rats) at night. This experiment will shed light on a possible brain region mediating the differential influences of light on behavior between a diurnal and nocturnal species.

A MODEL FOR CONTEXT-SPECIFIC SENSITIZATION TO COCAINE-INDUCED LOCOMOTOR ACTIVITY TO EXAMINE HIPPOCAMPAL GENE EXPRESSION UNDERLYING DRUG ADDICTION
Mackenzie Thibault
Category: Neuroscience, Section 2
Poster: 414
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): AJ Robison (Physiology)

Drug craving in addiction is mediated by maladaptive forms of learning. For example, environmental contexts frequently associated with drug taking underlie the context-induced craving that leads to continued use and relapse after prolonged abstinence. The hippocampus, a specialized part of the brain's limbic system, is essential for these drug-context associations, and chronic exposure to drugs causes changes in hippocampal gene expression and cell function. Our lab uses mouse models of drug-associated behavior to study addiction in order to uncover causal gene expression in the hippocampus, however we currently require a behavioral paradigm to measure the associations between drug and environment. Here, we show data detailing development of a paradigm that allows us to examine context-specific sensitization to cocaine-induced locomotor activity. The locomotor activity of mice was measured across 1 week during daily exposure to a cocaine-paired (15 mg/kg) context and a visually and tactilely distinct saline-paired context. After a 1 week drug-free period, separate groups of mice were tested in either the cocaine- or saline-paired contexts for basal (drug-free) and cocaine-induced locomotor activity. We found that mice increase basal and cocaine-induced locomotor activity in a context associated with prior drug exposure. Future studies will determine the contribution of individual gene expression changes in hippocampus to drug-context associations in the hopes of uncovering possible therapeutic targets for intervention in addiction.

ROLE OF NEUROTENSIN RECEPTOR-2 IN NEUROGENESIS
Emily Potter
Category: Neuroscience, Section 2
Poster: 415
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): AJ Robison (Physiology)

The neuropeptide neurotensin regulates cells that express Neurotensin receptor-1 (NtsR1) or -2 (NtsR2) and this signaling system has been implicated in control of feeding, locomotor activity and learning. The lack of facile methods to identify NtsR-expressing cells, however, has limited understanding of their function. To overcome this, our lab generated mice that express green fluorescent protein (GFP) in NtsR2 cells ($NtsR2^{GFP}$ mice), thereby permitting identification of NtsR2 cells via immunofluorescent microscopy. Analysis of $NtsR2^{GFP}$ mice revealed many NtsR2-expressing neurons in the basal cell layer of the dentate gyrus region of the hippocampus. Since this part of the hippocampus gives rise to newly born glia and neurons during adulthood, we hypothesized that NtsR2 cells might arise from adult neurogenesis. Indeed, immunofluorescent labeling for markers of the various stages of neurogenesis identified mature NtsR2-expressing neurons as well as putative immature or "newly born" NtsR2 neurons. To determine whether new NtsR2-expressing neurons can be generated *in vivo*, we injected $NtsR2^{GFP}$ mice with BrdU, which selectively incorporates into newly generated cells in the adult nervous system. We are currently analyzing brains from these mice for any cells that co-express NtsR2 and BrdU, which will represent newly born NtsR2 cells in the brain. Taken together, these studies reveal a possible role for neurotensin in the hippocampus and pave the way for future studies examining the role of NtsR2 in neurogenesis, learning, and disease.

EFFECTS OF 60-MIN SCIATIC NERVE STIMULATION IMMEDIATELY AFTER CUT AND REPAIR OF FELINE SOLEUS AND LATERAL GASTROCNEMIUS NERVES ON LOCOMOTOR EMG ACTIVITY OF ANKLE MUSCLES
Jason Schott, Megha Patel
Category: Neuroscience, Section 2
Poster: 416
Location: Ballroom
Time: 9:00 AM-10:45 AM
Mentor(s): Annette Pantall (Osteopathic Manipulative Medicine)

Following peripheral nerve injury, slow axon regeneration often results in poor functional recovery. Techniques such as electrical stimulation to the affected nerve have shown an increase in regeneration rate, but also to inappropriate targets. Little is known of the functional consequences that result from this type of intervention. This study aimed to identify what effects

electrical stimulation has on muscle EMG intensity and mean frequency after cut and repair of Soleus and Lateral Gastrocnemius nerves in felines. Intramuscular EMG electrodes were implanted into four hindlimb muscles including the Soleus (SO), Lateral Gastrocnemius (LG), Medial Gastrocnemius (MG), and the antagonist Tibialis Anterior (TA). Following baseline EMG recordings, the Soleus and Lateral Gastrocnemius nerves were cut and repaired using fibrin glue. The sciatic nerve was then stimulated for four 15 minute durations, with 5 minute rest intervals in between. Hindlimb mechanics and EMG data were then recorded weekly for 3 to 9 months. For some cats it was found that the mean frequency of SO increased and decreased for LG, implying SO became innervated by axons which previously innervated LG resulting in faster motor units and vice versa. MG saw an increase in intensity, and effects of TA post-reinnervation were variable.

POSTER PRESENTATIONS, SECTION 3
BALLROOM, 9:00-11:00 AM

EFFECTS OF SCORPION VENOM PAIN ON GRASSHOPPER MOUSE PREDATION
Hope White, Rolando Barajas, Amber Suto
Category: Neuroscience, Section 3
Poster: 419
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Ashlee Rowe (Neuroscience), Matt Rowe (Zoology)

Many arthropods employ painful, venomous bites or stings as presumed deterrents to their enemies. Surprisingly little research, however, has focused on the functions of such pain-inducing venoms. The predatory behavior of southern grasshopper mice *(Onychomys torridus)* provides an opportunity to study the adaptive significance of such toxins. The mice feed voraciously on arthropods, including relatively harmless and painless species of scorpions like the stripe-tailed scorpion (*Hoffmannius spinigerus*). The mice are similarly aggressive in attacking and consuming Arizona bark scorpions (*Centruroides sculpturatus*), a species possessing extremely painful stings containing potentially lethal, vertebrate-specific neurotoxins. The mice are completely resistant to the toxic components of bark scorpion venom, but only partially resistant to the venom constituents that cause pain. We conducted a set of prey-choice experiments to determine whether the mice prefer feeding on painless stripe-tailed scorpions rather than on painful bark scorpions. Size was a confounding variable, as stripe-tailed scorpions are notably larger than bark scorpions; mice might prefer the former simply because they are more nutritious. We controlled for both size and painfulness through a series of experiments variously matching the two species of scorpions for body size, or not, and by blocking/not blocking their ability to deliver a sting. Consistent with predictions from optimal foraging theory, our results suggest that both scorpion size and sting painfulness matter. While hungry grasshopper mice appear to prefer larger scorpions over smaller, more satiated mice are less willing to tackle prey items causing even temporary pain.

MAPPING NEUROTENSIN NEURONS IN THE BRAIN THAT COULD MODIFY ENERGY BALANCE
Thomas Mayer
Category: Neuroscience, Section 3
Poster: 420
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Gina Leinninger (Physiology)

The neuropeptide neurotensin (Nts) can suppress feeding and weight gain, but the Nts neurons that mediate these effects have yet to be defined. To identify Nts neurons that might be involved in regulating energy balance, we used a mouse model in which green fluorescent protein (GFP) is expressed only in Nts neurons, thereby permitting their visualization via immunofuorescent microscopy. As a first step we surveyed the overall distribution of Nts neurons in hypothalamic regions that can modulate feeding, including the arcuate nucleus, the ventromedial nucleus, the dorsomedial nucleus and the lateral hypothalamic area (LHA). We identified relatively few Nts neurons in the arcuate, ventromedial and dorsomedial nuclei, but observed many Nts neurons in the LHA. To begin to understand these LHA Nts neurons, we examined their distribution in relation to other known populations of LHA neurons that promote feeding, including neurons that express either the neuropeptide orexin (OX) or melanin-concentrating hormone (MCH). Using triple-label immunostaining to visualize each population, we observed that Nts neurons are a separate population from the feeding-inducing OX and MCH neurons. Furthermore, there were many more Nts neurons than OX and MCH neurons. Collectively, these data reveal that the LHA is the predominant site of Nts neurons within the hypothalamus, and suggest that the unique, large population of LHA Nts neurons could be the neural mediators of Nts anorectic action in the brain.

NEUROTENSIN REGULATES THE DOPAMINE SYSTEM AND LOCOMOTOR ACTIVITY
Hannah Batchelor
Category: Neuroscience, Section 3
Poster: 421
Location: Ballroom
Time: 9:00 AM-11:00 AM

Mentor(s): Gina Leinninger (Physiology)

Dopamine (DA) neurons in the Substantia Nigra (SN) and Ventral Tegmental Area (VTA) modify feeding, drinking and locomotor behaviors, but it is unclear what signals regulate DA neurons to "decide" behavioral output. We seek to understand how the neuropeptide neurotensin (Nts) regulates DA neurons and behavior. There are few Nts neurons in the VTA and SN, so local Nts release may not be the predominant regulator of DA neurons. By contrast, the VTA receives dense synaptic input from Nts-containing neurons in the lateral hypothalamic area (LHA). We therefore hypothesized that LHA Nts neurons modulate DA neurons and behavior. We first determined whether VTA DA neurons express neurotensin receptor-1 (NtsR1) or -2 (NtsR2), which are required to receive Nts signals. We found DA neurons that co-express NtsR1 or NtsR2, suggesting that Nts can directly regulate DA neurons. Next we used DREADD technology to selectively activate LHA Nts neurons to determine whether they specifically regulate VTA DA neurons and behavior. Activating LHA Nts neurons increased the amount of pCREB in VTA DA neurons and increased the locomotor activity of mice, similar to effects of drugs of abuse that act via the VTA. Collectively, these findings suggest that LHA Nts neurons directly regulate DA neurons expressing NtsRs, and activation of this circuit stimulates VTA DA neurons and DA-mediated locomotor behavior. Improved understanding of this neurotensin circuit will clarify how the DA system matches behavioral output with physiologic need to promote survival.

EFFECTS OF BASOLATERAL AMYGDALA INACTIVATION AND COCAINE EXPOSURE ON ACTIONS AND HABITS
Jane Balasz
Category: Neuroscience, Section 3
Poster: 422
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Alexander Johnson (Neuroscience)

A core feature of substance use disorders reflects persistent addictive behavior, despite knowledge of the adverse consequences associated with it (e.g., loss of friends, family, ill health). In the current study we modeled this habit-based behavior (i.e., continuing to perform a behavior even though those actions lead to a bad outcome) in rats using the reinforcer devaluation paradigm. Rats were trained to perform two actions for the receipt of distinct reinforcers (e.g., lever 1→sucrose; lever 2→polycose). Following training, rats received prefeeding treatment with one of the outcomes (e.g., unlimited sucrose access), which served to devalue it. As a result of this manipulation, drug naïve control rats showed a spontaneous reduction in responding to the lever associated with the devalued outcome (e.g., lever 1). In contrast, rats with a history of chronic cocaine exposure continued to respond for the devalued outcome. Next, we examined whether we could prevent this cocaine-mediated transition to habit-based behavior. To achieve this we inactivated (using GABA agonists) the basolateral amygdala (BLA) during cocaine exposure—as this region of the brain is particularly vulnerable to the detrimental effects of cocaine. Notably, inactivation of the BLA subsequently prevented the transition to habitual behavior as evidenced by the ability of these rats to correctly modify their responding based on reductions in outcome value. Thus, through this inactivation procedure we were able to prevent cocaine-induced habit-based behavior from occurring. These results identify a critical role for the BLA in decision-making and addiction.

AUTO FEEDBACK SYSTEM OF MESENTERIC ARTERIES AND VEINS AFFECTED BY THE G-PROTEIN SIGNALING MECHANISM
Holly Semma
Category: Neuroscience, Section 3
Poster: 423
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Elahe Crockett (Medicine), James Galligan (Pharmacology and Toxicology), Hui Xu (Pharmacology and Toxicology)

Alpha-adrenergic receptors (αAR) have an essential role in blood pressure regulation. α1AR, expressed by smooth muscles of arteries and veins, mediate vasoconstriction caused by norepinephrine (NE). NE is released from sympathetic nerves that supply arteries and veins. α2AR, located on sympathetic nerve terminals, inhibit NE release through negative feedback mediated by nerve terminal G-proteins. Our lab is interested in G-protein control of NE release and its importance for blood pressure regulation. Methods/Results**:** Mouse mesenteric artery and vein constriction caused by NE was studied in vitro. NE dose response-curves (0.01 μM - 30 μM) in mesenteric veins were left shifted compared to arteries, with the threshold concentration being much lower in veins than arteries. Veins had a half maximal effective concentration (EC50= 7.2 ± 0.4) while arteries had an average EC50 of 6.02 ± 0.06; (t-test, p=0.00853). The Nerve stimulation (20Hz, 1.5 sec) induced contraction of arteries and contraction were inhibited by UK14304 (α2ARagonist). Conclusion**:** Mouse mesenteric veins are more sensitive to NE than arteries. UK14304 activates α2AR to cause prejunctional inhibition of NE release. Future studies will use blood vessels from transgenic mice lacking the α2AR autoinhibition mechanism. These studies will help us better understand hypertension, which affects one billion individuals worldwide. Support**:** H.S. was a REPID scholar, supported by NIH-5-R25-HL108864 award to Elahé Crockett, REPID-Program Director.

EFFECTS OF METHYLMERCURY ON MITOCHONDRIAL MEMBRANE POTENTIAL IN PC12 NEURONS OVERTIME
Matthew James
Category: Neuroscience, Section 3

Poster: 424
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): William Atchison (Pharmacology and Toxicology)

Methylmercury (MeHg), is an environmental contaminant which exerts neurotoxic effects including sensory disturbances, cerebellar ataxia and cognitive impairment. Mechanisms by which MeHg-induced neuronal death and cytoarchitectural alterations in the nervous system include 1) loss of intracellular calcium homeostasis, 2) increase of neurotransmitter release, and 3) impairment of mitochondrial function. These mechanisms appear to interact with each other and exert excitotoxicity. For example, MeHg-induced increase of intracellular calcium([Ca2+]i) in biphasic fashion is derived from the release of mitochondrial calcium(Ca2+m) in the first phase while extracellular calcium plays a major role in the second phase of [Ca2+]i elevation. In addition, acetylcholine release appears to depend upon Ca2+m. In this study, we examined whether the alteration of mitochondrial membrane potential (MMP) depends upon 1) MeHg concentration and 2) length of time for MeHg insult. We also determined whether the alteration of MMP over time is correlated to the [Ca2+]i elevation. Ratio metric measurement of MMP fluorescence dye JC-1 indicated MMP alteration is independent of MeHg concentration, while MMP appears to change over time during MeHg insult. The fluctuation of MMP over a period of MeHg insult could be due to the protective mechanism by which mitochondrial uptake of [Ca2+]i in the early phase and then failure to do so in the last phase due to the over-excitotoxicity of MeHg leading to eventual cell death.

INORGANIC NANOCRYSTAL LADEN TISSUE ENGINEERED SCAFFOLDS FOR CT
Stacey Forton
Category: Neuroscience, Section 3
Poster: 425
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): Erik Shapiro (Radiology Osteopathic Medicine)

Photon counting spectral CT is a new imaging technology that is able to discriminate materials based on their x-ray absorption properties. Nanocrystal-laden materials with well characterized x-ray absorption properties are key to the use of photon counting spectral CT for molecular imaging. In this work, we report on the fabrication, and characterization of alginate and agarose tissue engineered scaffolds embedded with inorganic nanocrystals. Scaffolds are made for the use of linear nerve regrowth in spinal cord repair. This study uses microCT to image and characterize both *in vitro* and *in vivo* scaffold properties and degradation over time. Scaffold templates were made using blocks of poly(methyl methacrylate) fibers and a polystyrene matrix. Templates were made and etched using several solutions before being backfilled with either 3% aqueous agarose or 3% aqueous alginate to create scaffolds. Both the agarose and alginate contained 100 mM gadolinium oxide (Gd_2O_3) nanocrystals, allowing them to be viewed using a microCT scanner. For the *in vitro* study scaffolds were placed in phosphate buffered saline and kept at 37˚C. MicroCT images were taken at several time points over a period of 48 hours. Measurements were taken of the total volume and channel size of each image to quantify the rate of scaffold degradation. The *in vivo* study consisted of implanting either agarose or alginate scaffolds into the hind legs of CD1 mice. MicroCT images of the *in vivo* scaffolds were taken every two weeks and the volume of the scaffolds were measured to track degradation over time.

HIGH FAT DIET DOES NOT ALTER 5-HT_3R ACTIVATION IN THE JEJUNUM OF DIO MICE
Emmalee Skorich
Category: Neuroscience, Section 3
Poster: 426
Location: Ballroom
Time: 9:00 AM-11:00 AM
Mentor(s): James Galligan (Neuroscience)

In both obese humans and rodent models of obesity, intestinal transit is disrupted and may be due to altered 5-HT (serotonin) signaling. Research in our lab demonstrated an increase in 5-HT availability in obese mice due to decreased SERT function. An increase in 5-HT availability may desensitize 5-HT_3 receptors (R) localized on nerve terminals of intrinsic primary afferent neurons (IPANs) important in mediating smooth muscle contraction. My project focused on understanding if 5-HT_3R function is altered by performing 5-HT mediated contractions as a percentage of cholinergic reactivity in jejunal longitudinal muscle preparations in the presence of 5-HT_3R (Ondansetron, 0.1μM) antagonist maintained in vitro with methysergide (1μM), that blocks 5-HT_1R, 5-HT_2R, and 5-HT_7R. 5-HT was added at different doses (0.01-10 μM) to stimulate longitudinal muscle contractions measured as force (g) per tissue weight (mg). Blocking both 5-HT_3 receptors and non-target 5-HT receptors with methysergide produced a significant reduction of the 5-HT concentration curve in both male and female jejunum regardless of their diet ($p<0.05$). These reductions were most apparent at the higher doses of 5-HT (1-10 μM). In control males, 5-HT (0.3 μM) produced greater longitudinal muscle contractions compared to control females. This suggests that females may be less sensitive to lower concentrations of 5-HT.

POSTER PRESENTATIONS, SECTION 4

LAKE HURON ROOM, 1:00-3:00 PM

AN FMRI STUDY OF TIME PERCEPTION IN CHILDREN WITH AND WITHOUT AUSTISM
Frank Loomis
Category: Neuroscience, Section 4
Poster: 429
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Melissa Allman (Psychology)

There is a small, but growing number of empirical findings that suggest individuals' with autism experience differences in timing and time perception. To-date these studies have included behavioral-cognitive assessments, and have not been extended into functional brain mapping. It is reasonably well established that typical individuals tend to recruit cortico-cerebellar circuits when actively timing relatively short durations (e.g., <1-2 s) and cortico-striatal circuits when timing longer (>3 s) durations (although this is not mutually exclusive). The current study sought to examine which brain regions children with autism recruit when estimating magnitudes of "time" (duration). Children with and without a diagnosis of autistic disorder (8-12 years old) were scanned while performing a temporal ordinal comparison task; a standard duration (2 or 8 sec) was followed in quick succession by a comparison duration that was a deviant of the standard (± 12, 24 & 36%) and participants were required to judge whether the comparison was 'shorter' or 'longer' (than the standard). Group differences in regional activity were observed when children were timing both the standard and comparison durations: in contrast to controls, children with autism recruit tend to recruit the striatum for shorter durations and the cerebellum for longer durations. These results lend support to existing behavioral evidence that individuals with autism may subjectively experience the passage of time differently.

DIFFERENCES IN LONG-TERM MEMORY CONSOLIDATION AS A FUNCTION OF HEART RATE INTENSITY.
Effie Oates
Category: Neuroscience, Section 4
Poster: 430
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Matthew Pontifex (Kinesiology)

With an increased prevalence of sedentary behaviors in industrialized societies, a growing body of literature has begun to explore the effects of bouts of exercise on cognition. In spite of this, the implications as to how long-term memory consolidation may be influenced by activity throughout the day are still unknown. Accordingly, the purpose of this study was to examine differences in long-term memory consolidation as they relate to heart rate intensity measured between learning a declarative memory task and being tested on the task 12-hours later. A cross-sectional sample of college-aged young adults (50% female; Age = 19.4 ± 1.3) were assessed across two laboratory sessions. During the 12-hour interval between sessions, heart rate intensity was tracked using a Polar RCX3 heart rate monitor. Participants were bifurcated into groups based on memory consolidation. No differences in years of education, fitness level, body mass index, or prior night's sleep were observed between groups (p's ≥ 0.1). Analysis of the continuous heart rate data indicates that individuals who spent more time at sedentary heart rate intensities (quantified as a percentage of heart rate reserve [HRR]) throughout the day, demonstrated poorer long-term memory consolidation (p's ≤ 0.05). These findings indicate that consideration of time spent in sedentary activities may hinder long-term memory consolidation. Such findings further suggest that inclusion of physical activities throughout the day may be important for maintaining brain health and function.

CORTICOTROPIN RELEASING HORMONE (CRH) IS UPREGULATED IN AN ANIMAL MODEL OF VISCERAL HYPERSENSITIVITY
Andrew Mecca
Category: Neuroscience, Section 4
Poster: 431
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): James Galligan (Pharmacology and Toxicology)

Corticotropin releasing hormone (CRH) is an important mediator of the neuroendocrine stress response in many mammals, and has been implicated in stress-induced behavioral disorders such as anxiety and depression. Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder (FGID) that is often associated with stress-related behavioral disorders, which suggests dysfunctions in the neural circuitry between the brain and the gut. Both serotonin (5-HT) and CRH signaling may be altered in IBS patients. We studied serotonin transporter (SERT) gene knockout rats to determine if there is a difference in CRH protein expression compared to wildtype (WT) controls at the level of sensory afferent neurons. CRH protein expression in sensory neurons of SERT KO and wildtype female rats was visualized in lumbar and sacral dorsal root ganglia (DRG) using immunohistochemistry techniques. We found that female SERT KO rats display increased CRH protein expression in sensory neurons compared to female wildtypes, and increased CRH in small-diameter neurons may play a role in visceral hypersensitivity; an abdominal pain symptom characteristic of IBS.

A REVIEW OF REGIONS OF INTEREST DURING NATURAL READING
Michel Kabbash, Morgann Brafford
Category: Neuroscience, Section 4
Poster: 432
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Natalie Phillips (English)

The natural reading of complex literature has long been ignored in the field of neuroscience. Our fMRI study on Jane Austen has changed this. Eighteen English PhD candidates were presented the second chapter of Austen's Mansfield Park in 32 sections of text, which they read at their own pace. The first chapter was read outside the scanner to assess individual reading time and to acclimate subjects with the text itself. In the scanner, subjects read sections for both analytical close reading and pleasure reading. Upon completion of the task, subjects wrote essays on the sections of text they close read. Analysis of the fMRI scans has revealed that certain regions of the brain were more activated than others - dubbed "regions of interest", or ROIs. Mapping these regions and finding the areas of the brain they correlate to, along with those regions' responsibilities, shows how the brain functions while processing complex literature. Two of the main regions of interest that we found were the Brodmann region 22, Wernicke's Area - the area responsible for the comprehension of written language - and Brodmann region 44/45, or Broca's area, which deals with speech and language. Next, we took our ROIs and compared them to similar studies to see if they had matching activation in the same regions. Through this comparison, we found that several studies had coinciding stimulation in Brodmann areas that were triggered in our study as well.

THE TOXIC EFFECTS OF DISEASE-RELATED FORMS OF TAU IN AN IN VITRO MODEL
Matthew Orbain
Category: Neuroscience, Section 4
Poster: 433
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Nicholas Kanaan (Translational Science and Molecular Medicine)

Alzheimer's Disease (AD) is a disease that is characterized by its progressive, age-dependent degeneration of neurons found within areas of the brain that are important for memory and cognition. One of the pathological hallmarks of AD is the neurofibrillary tangles (NFTs), which are composed primarily of tau, a protein normally involved in microtubule stability. Despite the clear presence of significant tau pathology the toxic form of tau and mechanisms by which it contributes to cell death are still unknown. Recently, a potential mechanism of tau toxicity was identified that involves mis-folding of tau and activation of a signaling pathway that impairs axonal transport. Research was carried out by transfecting a cell line with tau constructs, these cells were then monitored closely and collected weekly. To arrest the cell cycle a serum deprivation model was imposed. Main results gathered from experimentation appear to show that cells that have been exposed to tau constructs that have had a deletion in the amino terminus (amino acids 2-18) seem to no longer express as large a toxic effect of tau proteins that, without the deletion, appear to be toxic to cells. An important conclusions that can be gathered from the data presented is that the amino terminus (specifically amino acids 2-18) is an important factor of tau toxicity which, when deleted from the protein, can show signs of resistance towards the toxic effects of tau. The presentation will conclude with possible routes of experimentation to take with the information gathered.

BRAIN REGULATORY AND REWARD PATHWAYS UNDERLYING 'HEDONIC HALLUCINATIONS' IN RATS
Andrew Chambers
Category: Neuroscience, Section 4
Poster: 434
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Alexander Johnson (Psychology)

The orexigenic neuropeptide melanin-concentrating hormone (MCH), synthesized in the lateral hypothalamus and expressed throughout brain reward centers, facilitates overeating in the presence of food-related cues by enhancing the taste of palatable food. To extend the characterization of these learned hedonic effects, the present study examined whether food-related cues could influence consumption of a tasteless water solution; and if so, whether MCH modulated this effect. In the paired condition, rats received exposure to a minimally and extensively trained auditory conditioned stimulus (CS) that was paired with a sucrose reward. A second group of rats (control condition) received the same number of cue and reward presentations in an unpaired manner. After acquisition, rats were presented unflavored water in the presence of each CS. Video recordings were taken and taste-reactivity (TR) responses--indicators of a high hedonic evaluation of a substance--were measured. Video analysis showed that when presented with the extensively trained CS, rats displayed significant consumption of water relative to minimally trained and control rats. In addition, measures of hedonic value (i.e., TR responses) increased as a result of training, indicating the ability of a trained auditory CS to elicit palatable hedonic responses to a non-palatable substance (i.e. water). To further investigate this effect, brain tissue was collected and stained for the marker of neuronal activity (c-fos). We will quantify c-fos expression throughout the brain reward circuit, including c-fos positive MCH cells, which will indicate the number active during

the 'hedonic hallucination' test.

FLUORESCENT-LABELED SLOW TRANSPORT ORGANELLE MOVEMENT IN EMBRYONIC CHICK FOREBRAIN NEURONS.
Stephen Vorenberg
Category: Neuroscience, Section 4
Poster: 435
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Kyle Miller (Zoology)

Currently there are no effective therapies to promote neuronal regeneration following spinal cord injury, stroke, or neurological diseases, such as Alzheimer's. While limited regeneration of neurons can occur in the peripheral nervous system (PNS) endogenously, regrowth in the central nervous system (CNS) is more limited or non-existent. The differences in the regeneration of CNS and PNS neurons are poorly understood. In previous studies we found chick sensory neurons from the PNS elongate rapidly because forces generated in the growth cone push and pull material forward in bulk. To examine if this same pattern of bulk movement occurs in neurons from the CNS, we cultured chick forebrain neurons and analyzed the movement of docked mitochondria and endoplasmic reticulum. Surprisingly instead of forward movement in bulk or simply remaining stationary, material along the length of the axon of chick forebrain neurons moved rearwards in bulk. To investigate the mechanism, we used the small molecule inhibitor of non-muscle myosin II (NMII) called Blebbistatin. Remarkably, we found that disruption of NMII blocked the rearward bulk movement and increased neuron outgrowth by 30%. This work suggests one reason neurons in the CNS regenerate poorly is that myosin II pushes or pulls material along the axon rearwards.

MARKERS OF MITOCHONDRIAL FISSION, FUSION, AND MITOPHAGY IN PARKIN-KNOCKOUT MICE
McKenzie Farthing
Category: Neuroscience, Section 4
Poster: 436
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): John Goudreau (Pharmacology and Toxicology), Keith Lookingland (Pharmacology and Toxicology)

Parkinson Disease (PD) is the second most common neurodegenerative disorder. Although most cases of PD are idiopathic, familial forms of the disease are found in patients with mutations in genes coding for proteins involved in proteostasis and mitochondrial maintenance. Mitochondrial dysfunction has been demonstrated in brains from PD patients and therefore will be explored in this study. Two of the key players in mitochondrial maintenance found mutated in PD are parkin and PINK1: parkin is an E3 ubiquitin ligase recruited to dysfunctional mitochondria with the help of PINK1 to promote mitophagy. Mitochondrial fission, fusion, and mitophagy are important in maintaining functioning levels of mitochondria. Western blot analysis will be conducted in axon terminal regions (striatum and median eminence) and dopaminergic cell body regions (substantia nigra and arcuate nucleus) for markers of mitophagy, fission, and fusion in wild type vs. parkin knockout mice (n=8). Mitofusion 1 (Mfn1) will be used to mark fusion, dynamin-related protein (Drp1) will be used to mark fission, and the conversion of LC3I to LC3II will be used to mark mitophagy. In this experiment, we expect to see normal amounts of Mfn1, Drp1, and LC3I to LC3II in wild type mice indicating a standard balance of fission, fusion, and mitophagy. Loss of function mutations in parkin cause mitochondrial defects that are controlled by an increased expression of Drp1 or a decrease of Mfn1 suggesting that PINK1/Parkin pathway promotes mitochondrial fission. Therefore, an increase of Drp1 and a decrease of Mfn1 in parkin-knockout mice is expected.

PHYSICAL SCIENCES

POSTER PRESENTATIONS, SECTION 1
LAKE HURON ROOM, 9:00-11:00 AM

A RADIO EMISSION ANALYSIS OF NOVA PUPPIS 1991 (V351 PUP)
Carolyn Wendeln
Category: Physical Sciences, Section 1
Poster: 439
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Laura Chomiuk (Physics and Astronomy)

Classical Nova Puppis 1991 (V351 Pup) went into outburst at the end of 1991, making it a thermonuclear runaway on the surface of the white dwarf in a close binary system. Multi-frequency radio detections from one epoch was published for V351 Pup in the early 1990's, yet the remaining data collected by the Very Large Array telescope (VLA) has remained unpublished since. We analyzed the remaining radio continuum observations for V351 Pup and fit the resulting light curve as expanding thermal ejecta. A well-fit model provides great insight into the total ejected mass, density profile, and the kinetic energy of a nova eruption. Radio light curves are one of the best ways to derive fundamental parameters, and the archival V351 Pup data are a wonderful

opportunity to expand the sample of well-studied novae.

A GREEN BANK TELESCOPE 21CM SURVEY OF HI CLOUDS IN THE MILKY WAY'S NUCLEAR WIND
Sara Denbo
Category: Physical Sciences, Section 1
Poster: 440
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Alyson Ford (National Radio Astronomy Observatory)

Feedback processes such as large-scale galactic winds are thought to be responsible for distributing enriched gas throughout a galaxy and even into the IGM. Such winds have been found in many galaxies with active star formation near their center, and the Fermi bubbles provide evidence for such a nuclear wind in our own Milky Way. A recent 21 cm HI survey by the Australia Telescope Compact Array discovered a population of compact, isolated clouds surrounding the Galactic Center that may be entrained in the Fermi bubble wind. We present data from a survey of 21cm HI over an extended region around the Galactic Center using the Green Bank Telescope. These observations provide more strict constraints on neutral clouds in the Fermi bubble wind, and a more robust description of the parameters of HI clouds (i.e., mass, column density, and lifetime) near the Galactic Center.

PION PRODUCTION SIMULATIONS FOR SYMMETRY ENERGY STUDIES
Hananiel Setiawan
Category: Physical Sciences, Section 1
Poster: 441
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Man-Yee Betty Tsang (National Superconducting Cyclotron Laboratory)

The nuclear equation of state (EOS) is an important thermodynamic relation to describe nuclear matter. Full understanding of the nuclear EOS requires understanding of the symmetry energy. Symmetry energy is the reduction of binding energy of a nucleus when the number of neutrons and protons are not equal. To determine how the symmetry energy varies with density, we rely on different experimental probes from heavy ion collisions and the transport models that describe the dynamics of heavy ion collisions. One proposed probe is by using pions which are generally produced early in the collisions and reflect the effect of symmetry energy at high density, higher than the density of the interior of a heavy nucleus/saturation (about 2.8E14 g/cm^3). I will present simulation results using the Boltzmann Uehling Uhlenbeck (BUU) transport codes developed by J. Hong and P. Danielewicz at the National Superconducting Cyclotron Laboratory (NSCL). Specifically, I will discuss our search for observables that can provide clearer sensitivity to the symmetry energy from pion data. A lot of work has been done at NSCL to understand the behavior of the symmetry energy in densities above saturation. With FRIB, we will be able to create nuclear density above the saturation. Determining the high density behavior of the symmetry energy is necessary to describe heavy-ion collisions and the properties of neutron stars.

ANALYSIS OF THE EFFECT OF COMMON CLEANERS ON PENNIES USING SEM AND EDS
Filip Milojevic
Category: Physical Sciences, Section 1
Poster: 442
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

The purpose of this experiment is to explore the effect of four solutions on old and dirty pennies made before and after 1982. This date was chosen, because the pennies changed from 95% copper, 5% zinc to 97.5% zinc, 2.5% copper coating. Eight different pennies, four before and four after 1982, were imaged under a variable pressure scanning electron microscope (SEM) and analyzed using energy dispersive spectroscopy (EDS) at three spots before and after being exposed to a solution. The four solutions were bleach, Coca-Cola, distilled water, and a common coin cleaner. These four solutions were chosen as they represent common basic, acidic and neutral solutions. The coin cleaner was chosen as a means of comparison to the other solutions and the coin cleaner contains sodium hydroxide making it basic. All eight pennies had a considerable amount of foreign substance on them and the EDS analysis indicated carbon, oxygen, sometimes silicon, as well as the expected copper on these areas.

CSI(TL) CRYSTALS FOR CHARGED PARTICLE DETECTION
Corinne Anderson
Category: Physical Sciences, Section 1
Poster: 443
Location: Lake Huron Room

Time: 9:00 AM-11:00 AM
Mentor(s): William Lynch (Physics and Astronomy), Betty Tsang (Physics and Astronomy)

The energies of nuclear particles emitted during a nuclear reaction are among the most important quantities to measure experimentally. For many experiments, these particles would be neutrons, protons and light atomic nuclei. Except for neutrons, these particles have non-zero charges, which will interact via the Coulomb force with the electrons in detectors. Energies of these charged particles can be measured by counting the electrons that are ionized by the particle when they pass through detectors or by measuring the light that accompanies this ionization. CsI(Tl) crystals emit light abundantly when charged particles pass through them, and the amount of light is proportional to energy. Energies of charged particles detected in CsI(Tl) crystals are determined by measuring this light. This poster discusses how the crystals are made and fabricated into detectors, provides some results using these crystals to detect particles and discusses how these crystals are combined into arrays and used to study nuclear reactions. Specifically I will discuss my work in designing upgrades to the CsI crystals of the High Resolution Array (HiRA) to improve the performance of HiRA in detecting higher energy of the particles as well as increasing the granularity of the 2x2 CsI array to 3x3. This material is based on work supported by the NSF under Grant No. PHY-1102511

POSTER PRESENTATIONS, SECTION 2
LAKE HURON ROOM, 9:00-11:00 AM

WHAT DOES MONEY REALLY LOOK LIKE?
Krista Young
Category: Physical Sciences, Section 2
Poster: 447
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

There are two general facts that are known about the United States currency. First, the average life span of a one hundred-dollar bill is fifteen years and around six years for a one-dollar bill. However, the government newly updated all bills but one over the last decade to add security features. The one-dollar bill is the only bill that has not been affected. To look at how this affects the bill at the microscopic scale—such as differences in fibers and amount of dust particles—both a newly printed one hundred-dollar bill and an older one-dollar bill will be compared under the scanning electron microscope. A piece of each bill will be examined to look for comparisons and contrast between the fibers and particles on the bills. Assuming that the original statements provided are true, it would be expected that one would find the piece of the one-dollar bill to be more heavily covered with other particles—such as dust. There should also be differences based on the fact that the one hundred-dollar bill has been updated with added features to enhance security—although it is not exactly known what these features are. We can also look for the differences in strength of the fibers by comparing the bills to other types of paper such as tissue or white printer paper. The observations that will be made from this research should help clarify these differences and to add to the assumptions about the circulation of the U.S. currency.

LEAKY BAGS
Julian Lipton
Category: Physical Sciences, Section 2
Poster: 448
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

Plastic bags, like Ziploc, are a common item in ever day households. Often, when used repeatedly or in extreme temperatures, the structural integrity of the bag decays and breaks around the corners. This is happens often when customers have need to ice their injuries. I will look at the different sizes of Ziploc bags to determine which size leaks least in cold temperatures. Using a scanning electron microscope and research on the composition of Ziploc bags, I will determine why it is that they leak. Through this research I hope to find ways to so they stop leaking on their users. Furthermore, I will be able to potentially improve the durability of these bags by preventing them from leaking on customers, specifically when they need to use their Ziploc bags as ice packs.

A HISTORICAL ANALYSIS OF WOMEN IN PHYSICS: WHERE ARE THEY?
Aubrey Chartier
Category: Physical Sciences, Section 2
Poster: 449
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Vashti Sawtelle (Lyman Briggs College)

This research investigates the placement of notable women in the field of physics and specifically investigates whether women as a group are more recognized within the field of astronomy. Many early social structures effectively barred women from higher institutions of learning, especially within the STEM fields. Women were also kept out of many of the social aspects of the scientific community. Even with these social barriers, there are notable exceptions of women who found ways to bypass these social barriers and achieve significant accomplishments in the field of physics and STEM as a whole. This research reveals that many women found access to the realm of physics through its more observational subfields such as astronomy and astrophysics. In this poster we present explorations of the question of whether women were not present in physics or of they were simply not recognized for their contributions. In the latter case, we present the barriers women faced in gaining recognition. Given the common stance that there are very few women who were indeed involved in physics, it is important to look at the history of women in the subject. Noticing that women were and continue to be present in the sciences, specifically physics, is encouraging to all women pursuing science and their passions today. This work has implications for raising awareness of the programs and immense support network for professional women today as well as the progress that has been made on this issue.

EFFECT OF SEDIMENT CONCENTRATION ON TITAN FLUID DYNAMICS
Benjamin Brophy
Category: Physical Sciences, Section 2
Poster: 450
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Vincent Chevrier (Arkansas Center for Space and Planetary Sciences)

Understanding the viscosity of fluids on the surface of Titan can tell us about the nature of flow on the surface, what size boulders can be transported, and whether waves form in Titan's methane lakes. The viscosity of any fluid is dependent on the temperature of the fluid and the concentration of sediments in the fluid. Because of the narrow temperature range on Titan (90 K - 94 K) the concentration of sediments within a fluid should be the dominating factor in viscosity variation. Sediments expected to be dissolved in Titan fluids are tholins, nanophase particulates formed by irradiation of organic compounds in Titan's atmosphere. The main objective of this study is to determine a model for the dependence of viscosity on the concentration of sediments in polar and non-polar solvents, and use the results to predict the flow of liquids on the surface of Titan. For prelimary investigation of sediment concentration effect on fluids, two polar solvents, acetone and ether, and two non-polar solvents, pentane and hexane were selected. The sediment used was silicon dioxide nanoparticles. This sediment was selected as an analogue to tholins due to similar structural properties, non-reactivity in the solvents, and being on the same scale of density. EZ viscosity cups and a rotational viscometer were used to measure the viscosity of the tested mixtures.

MUC1 EPITOPE MAPPING
Anthony Allmon
Category: Physical Sciences, Section 2
Poster: 451
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Xuefei Huang (Chemistry)

We are studying the viability of using the mucin 1 (MUC1) glycoprotein as a target for anti-cancer vaccines. Early testing of a repeated 20 amino acid segment (20-mer) of the MUC1 protein has shown success in generating an immune response. Antibodies generated from the 20-mer showed strong binding to the peptide used to make the vaccine, but almost no binding at all when tested against tumor cells presenting the full glycoprotein. By breaking the original 20-mer into overlapping 8-mer sequences, we can narrow down the segments that may signify better targets for vaccines and focus future efforts there.

POSTER PRESENTATIONS, SECTION 3
LAKE HURON ROOM, 1:00-3:00 PM

ALGORITHMS FOR BETA-GAMMA COINCIDENCE DETECTION OF RADIOXENON IN A GEDSSD
Alexander Chemey
Category: Physical Sciences, Section 3
Poster: 455
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Sean Liddick (Chemistry)

The proliferation of nuclear weapons has led to nuclear weapon tests, as well as subsequent attempts at banning nuclear weapons tests. It is only through the collection of radioactive materials that observers may determine if it was a nuclear explosion. The materials selected for radiation analysis must meet stringent chemical and physical features to be detected

successfully, and be produced in large quantities from a nuclear blast. Xenon is an element with several isotopes that fit the bill, and we may determine important information from the isotopic/isomeric ratios of four isotopes and isomers. From these, we may determine the nuclear or conventional nature of the blast. This project is simulating the beta-gamma coincidence detection of radioactive xenon isotopes in a high-purity planar germanium double-sided strip detector, based on a detector at Michigan State University. Since this time last year, the algorithms have advanced significantly. Over the last year, the existing capabilities have been verified, maintained, and expanded upon. Current research focuses on determining if the simulated detector is more efficient and effective at detection of xenon isotopes than present established benchmarks from real-world detector systems.

PRODUCTION OF THE RAREST ELEMENTS ON EARTH THROUGH HEAVY-ION FUSION
Michael Metiva
Category: Physical Sciences, Section 3
Poster: 456
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Zach Kohley (Chemistry)

Uranium is the heaviest naturally abundant element on earth with 92 protons (Z=92). The elements from Z=92 up to Z=118 have all been synthesized using nuclear fusion reactions, but it is an extremely complex process and grows more unlikely as the elements get heavier. Fortunately, the NSCL and ReA3 facilities at MSU offer the opportunity to explore these reactions further. In order to take full advantage of these opportunities, experimenters need to be able to predict the probabilities involved in these reactions and plan their experiments accordingly. To this end, a new simulation was developed to calculate the probabilities implicit in the different steps of the fusion process. The simulation is able to reasonably reproduce current experimental data. Different methods of calculation are being added to improve accuracy and understanding. An overview of these calculations and the process by which the simulation was built will be presented.

PHOTOGRAMMETRY MEASUREMENTS OF A TIME PROJECTION CHAMBER
Benjamin Brophy
Category: Physical Sciences, Section 3
Poster: 457
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): William Lynch (Physics and Astronomy), Betty Tsang (National Superconducting Cyclotron Laboratory)

In nuclear physics experiments, it is important to know the exact position of critical components of detectors built by the users with respect to the beam position on the target (where nuclear collisions occur). Often, we need to know the position of critical elements of a permanent piece of equipment to be used in conjunction with the detector built by the user. Recently we tried a calibrated camera system from Geodetic in which multiple photographs of an object can be reconstructed into a 3-dimensional coordinate system to make 3D measurements of the object of interest. This measurement technique known as photogrammetry is accurate to <100 micrometer. Its sophisticated software provides a user friendly environment for nuclear physicists to do position measurement of their detectors and equipment. In this poster, I will describe using the technique to measure the relevant dimensions of the SAMURAI Pion-Reconstruction and Ion-Tracker (SpiRIT), a Time Projection Chamber (TPC), designed for measurements of the density dependence of the nuclear symmetry energy around twice the saturation density. This TPC will be placed inside the large SAMURAI dipole magnet in the Rare Isotope Beam Facility (RIBF) in RIKEN Wako, Japan. Thus we have to know the relative locations of the TPC drift volume (the heart of the detector), with respect to the enclosure of the TPC, the dipole magnet of SAUMRAI, and other auxiliary detectors.

TRANSMUTATION OF CHARGE-DENSITY-WAVE STATES IN TAS2
Anna Turnbull
Category: Physical Sciences, Section 3
Poster: 458
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Chong-Yu Ruan (Physics and Astronomy)

Due to their unique electrical properties and industrial potential, two-dimensional crystals like graphene and transition metal dichalcogenides have growing scientific interest. Here we explore phenomenon regarding the phase transitions of one of these types of crystals. Using ultrafast electron pump-probe methods, 2D tantalum disulfide (TaS2) crystals can be observed to transition from the nearly-commensurate charge-density-wave state (NC-CDW) to the incommensurate charge-density-wave state (IC-CDW). Analysis of the electron diffraction patterns taken during the transition show a consistent twelve degree rotation of the CDW peaks from the NC-CDW to the IC-CDW. The dynamics show that the phase transition occurs in two picoseconds with a fluence greater than 4 MJ/cm^2 via the photo-doping effect. Multiple samples of TaS2 were analyzed, showing no correlation between thickness of the sample and full rotation of the CDW peaks. It is likely that the topological features and surface strain of the samples play a greater role in the transition. A full mapping of surface strain with associated CDW rotation is necessary to show correlation.

ANALYSIS OF GRAIN SHAPE AND STRUCTURE TO DETERMINE HABITABILITY AT THE MARS PHOENIX LANDING SITE
Joe Backlas, Adam Fine, Andromeda Veach
Category: Physical Sciences, Section 3
Poster: 459
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Michael Velbel (Geological Sciences)

One of the many goals of the Mars Phoenix Lander was to determine whether life ever arose on Mars. This study used images obtained by the Phoenix OM as well as images taken with a scanning electron microscope of one of the Martian regolith simulants, Mars Mojave Simulant (MMS), to find similarities in the geologic history of the two soil samples. Since the geologic history of MMS is well known, a comparison between images of both soil samples can allow inferences about the geologic history of the Martian regolith near Phoenix to be made. However, limitations in the level of detail the Phoenix OM could discern make comparison difficult. The features that have been observed on MMS include flat, planar surfaces and "chatter marks", which could be signs of fluvial activity on MMS. These features are too small to clearly be seen at the 4 μm resolution of the Phoenix OM. Because of this, further work must be done to identify these features at the Phoenix OM resolution.

MICROSCOPIC ANALYSIS AND COMPARISON OF JSC-1 MARS ANALOG WITH THE PHOENIX LANDER OM IMAGES OF MARTIAN REGOLITH
Jason Kim, Nathan VanderRoest, Isaiah Walker
Category: Physical Sciences, Section 3
Poster: 460
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Micheal Velbel (Geological Sciences)

This study examined grains of JSC-1 Mars Analog and pictures of grains taken by Phoenix Lander in order to see if Mars is habitable. The project included pictures of grains from Mars, taken by Phoenix Lander and grains that came from similar environments on Earth, grains from Mauna Kea volcano in Hawaii. Studying Mars soil is extremely difficult without being able to examine the actual samples in the laboratory. Furthermore, grain images sent from various landers on Mars are difficult to study because of their low resolutions. Because of this, scientists use samples that are collected on Earth that mimic the Martian environment, materials, or properties as measured by Mars missions. Examining the sizes, shapes, and surface textures of the JSC-1 Mars analog, collected from Mauna Kea volcano in Hawaii, enables improved interpretation of the grain shapes and characteristics on Mars. This project used images taken by an electron microscope and studied the grain size, shape, texture, and length-width ratio. In doing so, the group was able to compare selected results from the analog with similar analysis of the grains on Mars. By using the knowledge about the processes that formed the characteristics and compositions of Earth samples, it can be inferred what the same characteristics from Martian regolith may mean.

EXPLAINING THE BEHAVIOR OF CRYSTALLINE AND POLYCRYSTALLINE GEMSTONES
Alexis Rogien
Category: Physical Sciences, Section 3
Poster: 461
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

Crystalline solids are materials whose atoms are arranged in a highly ordered microscopic structure. Some materials are made of a single crystal while others are composed of many crystals bonded together. This research delves into the complexity of gemstones, both crystalline and polycrystalline. Explaining the behavior of crystalline solids can be difficult unless analyzed at the microscopic level. The purpose of this project was to characterize natural and synthetic gemstones as crystalline or polycrystalline using a Scanning Electron Microscope (SEM). It was possible to determine the stones' crystal structures, examine crystal defects and impurities, and explain the behavioral characteristics of each type of crystal based on the SEM images. A process known as Energy Dispersive Spectroscopy (EDS) was used to determine unknown gems' chemical compositions and identify the compositions of surface impurities.

VISUALIZING NANOPARTICLES: PROPERTIES AND APPLICATIONS
Hailee Perrett
Category: Physical Sciences, Section 3
Poster: 462
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials

Science), Xuefei Huang (Chemistry)

At less than 100nm in size, nanoparticles have revolutionized the engineering and medicine worlds with their proven utility on a micro and macro scale. One such asset is that they usually have a greater surface area to weight ratio than their larger counterparts which results in greater reactivity. Beyond this, their small stature proves to be hugely beneficial when strengthening, reducing the weight of, or otherwise altering many materials. Many consumer products already incorporate these particles into their designs including, among other things, everyday items such as sunscreen, textiles, sporting equipment, and steel. Of particular interest to this study are iron oxide and carbon nanoparticles. The former has been undergoing extensive research lately for its unique superparamagnetic property. This attribute has been speculated to be of use in drug therapy treatments; assistance to cancer detection, diagnosis, and therapy; and for its potential use in molecular imaging technology with magnetic resonance imaging (MRI). Carbon nanoparticles are often used as additives in polymers and polymer composites in order to modify the mechanical, thermal, and electrical properties of the material. Through the implementation of scanning electron microscopy, these particles can be made visible to the human eye. With the aide of images obtained from the microscope, the various abilities and applications of nanoparticles will be discussed.

PLANT SCIENCES

POSTER PRESENTATIONS, SECTION 1
ENGAGEMENT CENTER, 1:00-3:00 PM

MEASURING ATP REGULATION IN ALGAE BY EXPLORING ITS ELECTROCHROMIC SHIFT DECAY KINETICS
Kip Andrews
Category: Plant Sciences, Section 1
Poster: 463
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): David Kramer (Plant Research Laboratory)

The lab of David Kramer discovered that a particular absorbance signal called the elctrochromic shift can be used as a measurement of the in vivo activity of the chloroplast ATP synthase in plants. Using this signal, the lab showed that the ATP synthase plays a key role in regulating photosynthesis. As part of my Capstone research project in Biochemistry, I intend to extend these studies to the green algae Chlamydomonas. My research will be conducted in the PRL Kramer lab in the Plant Biology building of Michigan State University, with every resource provided to me by the lab. I will be under the supervision of postdoc Ben Lucker. The overall goal is to test the hypothesis that the ATP synthase regulation plays the same role in algae as in plants. I will first establish methods for growing the algae and measuring their electrochromic shift decay kinetics. I will then apply these methods to compare the responses of 5 different Chlamydomonas under a range of nutrient and environmental conditions (light intensities, CO2 levels, temperatures, Calvin-Benson Cycle activity) known to affect ATP synthase regulation in plants. I will then compare trends in data with similar experiments performed in plants to determine under what conditions ATP synthase regulation is similarly controlled between the species and the lines.

FUNCTIONAL CHARACTERIZATION OF A LIPID TRANSLOCATOR IN CHLAMYDOMONAS REINHARDTII
Elena Michel
Category: Plant Sciences, Section 1
Poster: 464
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Christoph Benning (Biochemistry and Molecular Biology)

The green alga, Chlamydomonas reinhardtii, stores triacylglycerol (TAG) when deprived of nutrients such as nitrogen. Elucidating the pathway lipid transport and biosynthesis pathways in Chlamydomonas will provide valuable information to increasing fatty acid outputs that can be used for downstream biofuel processing. Our lab has demonstrated that in Arabidopsis, the TGD2 protein is a substrate-binding component of a proposed lipid translocator located at the inner chloroplast envelope membrane as part of a complex, and is involved in transporting lipid intermediates from the ER for thylakoid lipid biosynthesis. The purpose of this study is to determine if the TGD2 protein in Chlamydomonas is an ortholog (functionally equivalent) to TGD2 from Arabidopsis TGD2 CDS from Arabidopsis has been cloned into Chlamydomonas to determine if AtTGD2 can complement the tgd2 knockout mutant. Additionally, TGD2 CDS from Chlamydomonas will be introduced into the Arabidopsis tgd2 mutant. Fusion proteins were created via Gibson assembly, and the expression of the proteins was analyzed by western blot, RT-PCR and analysis of the lipid profile according to the mutant phenotypes. Comparing two distantly related organisms can help to determine the lipid trafficking pathway in Chlamydomonas compared to Arabidopsis.

SHEDDING LIGHT ON PHOTOSYNTHESIS
David Salvatori, Aaron Walkowski

Category: Plant Sciences, Section 1
Poster: 465
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): John Froehlich (Plant Biology)

Photosynthesis is the defining event commonly associated with plant life: it converts light energy, captured by pigment-containing light-harvesting antennae (i.e. chlorophyll), into chemical energy that ultimately sustains all life on our planet. Although photosynthesis is a very complex process, it can be conveniently divided into two stages. In the first stage, the light-dependent reaction, the chloroplast trap light energy and convert it into chemical energy contained in nicotinamide adenine dinucleotide phosphate (NADPH) and adenosine triphosphate (ATP), two molecules which are then used in the second stage of photosynthesis. In the second stage, called the light-independent reaction (or Dark reactions), plants utilize both NADPH and ATP to synthesize glucose. The entire photosynthetic process requires a unique set of elaborate protein complexes embedded within thylakoid membranes localized in chloroplasts. The four major photosynthetic com¬plexes are called: photosystem I (PSI), photo¬system II (PSII), the cytochrome b6f complex, and the ATP synthase complex. Each complex plays a unique and essential role in photosynthesis. Currently, using an array of approaches, we are investigating the structure and function of these various photosynthetic complexes in order to understand how the overall photosynthetic process works. Specifically, we are investigating the roles of several newly identified ancillary proteins that may be involved in regulating different photosynthetic complexes when subjected to various environmental conditions. It is envisioned that by gaining a more detailed understanding of photosynthesis, we may ultimately be able to make the process more efficient.

SPHINGOMONAS WITTICHII RW1 METABOLISM OF DIOXIN
Lauren Bell, Allison Brazeau
Category: Plant Sciences, Section 1
Poster: 466
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Lisa Boughner (Center for Microbial Ecology), James Tiedje (Plant, Soil and Microbial Sciences)

Organisms, such as Sphingomonas wittichii strain RW1, that inhabit environments that contain Dibenzo-p-dioxin (DD), a naturally occurring toxin, exhibit properties that aid in the metabolic breakdown of the toxin, allowing for their survival. Dioxin compounds introduced to foreign environments, however, can have detrimental effects. While the enzymes involved in the metabolic degradation of DD by S. wittichii RW1 have been studied, we are interested specifically in the genomic properties of RW1 that play a role in the metabolism of dioxin as they may be key to reversing the pollutant effects of foreign environmental DD. Genes of interest were determined through growth of S. wittichii RW1 in minimal media consisting of a single carbon source: dioxin, dibenzofuran (DBF), or succinate (SUC). The RNA from these cultures was then extracted and sequenced, so that differential gene expression could be analyzed. Fourteen of these genes, which presented statistically significant ratios, were chosen to be extensively studied. Our aim is to insert the fourteen genes of interest into plasmids in order to clone the plasmids in Escherichia coli. The bacteria with the genomic insert will then be grown in the presence of DD, DBF, and SUC; the results may determine which genes are involved in the organismal degradation of dioxins. Defining the genes necessary for the degradation of dioxins could essentially eradicate the industrial sources of dioxin compounds in the environment.

BACTERIAL DISEASES OF GRAMINACEOUS PLANTS
David Bur
Category: Plant Sciences, Section 1
Poster: 467
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Nancy Dykema (Plant, Soil and Microbial Sciences)

Graminaceous plants, also known as Poaceae or more commonly as true grasses, represent the fifth largest plant group. This family of monocotyledonous flowering plants includes cereal crops as well as ornamental grasses. Though it is not the largest group, it represents the world's most important source of food. This significance to the food industry makes pathogenic diseases that target graminaceous plants very important. The three most important graminaceous crops include corn, wheat, and rice. Ornamental grasses are used at the home for lawns and gardens, and in sports for fields in soccer, football, or golf. The two most common genera of bacteria that attack cultivated cereals and wild grasses are Pseudomonas and Xanthomonas. Pseudomonas includes 17 different bacterial species and Xanthomonas includes 5 species. Some of the diseases caused by these species include bacterial wilt, bacterial blight, halo blight, bacterial stripe, leaf blight, basal glume rot, and a few others. Several of these bacterial species attack multiple graminaceous plants and some are more specific. The methods for identifying these bacterial diseases and the strategies of control can be very similar between plants. The goal of this literature review is to gain a better and broader understanding of how bacteria affect graminaceous plants.

BASELINE SENSITIVITY TO THE FUNGICIDE FLUOPYRAM IN ISOLATES OF FUSARIUM VIRGULIFORME, CAUSAL AGENT OF SUDDEN DEATH SYNDROME IN SOYBEAN

Olivia Stenzel
Category: Plant Sciences, Section 1
Poster: 468
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Martin Chilvers (Plant, Soil, and Microbial Science)

Soybean sudden death syndrome (SDS) is among the most damaging soil-borne diseases of soybean crops in North and South America. In the United States, the causal agent of this disease is the fungal pathogen, Fusarium virguliforme. Fluopyram is a succinate dehydrogenase inhibitor (SDHI) fungicide. The use of fluopyram as a seed treatment for control of a soil-borne disease in soybean is a new application for this class of fungicides. In numerous field trials, fluopyram treated soybean seed demonstrated promising disease management of SDS. However, the efficacy of fluopyram's inhibition on growth of F. virguliforme in vitro is unknown. In this study, over 100 isolates of F. virguliforme isolated from fields across the United States were grown in triplicate on half strength potato dextrose agar containing fluopyram concentrations of 0, 1, 5, 10, 25, 50, and 100 ppm. Colony size was measured at 3 and 10 days to determine relative growth. EC_{50} (defined as a 50% reduction in growth) was determined using Package drc in R. The EC_{50} range was determined to be 0.84 to 9.78 ppm of fluopyram for all of the isolates. This suggests a wide variability in isolates ranging from sensitive to a moderate level of resistance to the fungicide. We are currently performing horizontal comparisons of the efficacies of other fungicides, a beta-tubulin assembly inhibitor, a mixture of a quinone outside inhibitor and a demethylation inhibitor, to that of fluopyram.

POSTER PRESENTATIONS, SECTION 2
ENGAGEMENT CENTER, 1:00-3:00 PM

A CORRELATION BETWEEN THE PHYSICAL PROPERTIES OF WOOD AND ITS MICROSTRUCTURE
Ryan Mathews
Category: Plant Sciences, Section 2
Poster: 471
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Per Askeland (Composite Materials and Structure Center)

It has long been accepted that different types of wood have different physical properties. The purpose of this study is to find a correlation between the physical properties of wood and its microscopic features, such as the amount of cellulose and lignin. To do this, samples of wood will be viewed at the microscopic level using a scanning electron microscope. A variety of different wood samples will be used in this process. These images of different wood samples obtained by the scanning electron microscope will be compared to each other to search for correlations between the physical properties of the different types of wood and their microscopic features. The physical properties being investigated include, but are not limited to, the specific gravity, compressive strength, and hardness of the wood.

SORGHUM GROWTH AND PRODUCTION IN SOILS FROM DIFFERENT SWITCHGRASS VARIETIES
Katherine Grantham
Category: Plant Sciences, Section 2
Poster: 472
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Karen Stahlheber (Kellogg Biological Station)

Swithgrass (Panicum virgatum) is becoming increasingly used as a biofuel crop. However, little is known about the relationship between switchgrass and its associated microbial communities. Results from prior research suggest that fertilization may have a negative impact on microbial associates, so it is important to understand how fertilization and microbial communities interact to determine above ground production in biofuel crops. We conducted a greenhouse study to examine how fertilization and the presence of the soil microbial community from fields of two varieties of switchgrass affected growth and production of sorghum, a fast-growing grass similar to switchgrass. Fertilization had no consistent effect on above ground production; however, sterilization did affect sorghum production in soils from fields planted with the Cave-in-Rock switchgrass variety. Above ground production was lower in plants grown with living soil in both fertilized and unfertilized treatments. For the second switchgrass variety, Southlow, sorghum grown in fertilized, living soils produced the most above ground biomass. In contrast, below ground biomass was significantly greater in sterile soil compared to live soil for in both varieties, although more so for Cave-in-Rock. Height and phenology were not consistently affected by the type of soil. Future studies should examine how alternative organic fertilizers, such as cover crops and compost, may affect biomass production in switchgrass, making agricultural practices associated with biofuels more sustainable.

HYPOVIRULENCE: BIOLOGICAL CONTROL OF CHESTNUT BLIGHT
Peter Vites
Category: Plant Sciences, Section 2

Poster: 473
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Dennis Fulbright (Plant, Soil and Microbial Sciences)

Chestnut blight is an invasive fungal disease of the chestnut tree (Castanea spp.) from China caused by Cryphonectria parasitica. The fungus wiped out the native North American chestnut forest in the Appalachian Mountains and is still present and infecting sprout clumps as they grow from old roots. Chestnut trees were an important source of food for numerous wildlife species in the eastern United States. Humans utilized the chestnuts as a cash crop for livestock feed and the wood was valuable in the lumber industry. Today, there are few chestnut trees available for commercial use, and the eastern U.S. forest ecosystem has completely changed. Chestnut blight also invaded the European forests, however, before they were destroyed a naturally occurring biological control developed. The fungus was reduced in its aggressiveness when infected with a virus. The virus is called a hypovirus, due to this reduced aggression, or hypovirulence. Where hypoviruses are present in chestnut tree populations fewer trees die from blight and survivors develop non-lethal cankers (infections) instead of lethal cankers. A group of hypoviruses has been found in Michigan and are called CHV3. CHV3 hypoviruses have considerable potential for biocontrol applications. This experiment attempted to infer hypovirulence (transfer of dsRNA) to a virulent strain. If the dsRNA is successfully transferred, the hypovirulent strain can be applied to the original canker and recovery of the tree is possible. Gel electrophoresis can confirm the presence of CHV3, which leaves a distinct dsRNA finger print on a gel, making it easily distinguishable.

DIFFERING LIGHT INTENSITY CONDITIONS HAD LITTLE EFFECT ON THE MINOLTA SPAD AND PHOTOSYNTHETIC EFFICIENCY IN Q.IMBRICARIA TREES DURING AUTUMN
Lane McCandless, Shibin Joseph, Malavika Seetha
Category: Plant Sciences, Section 2
Poster: 474
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Sonya Lawrence (Biological Sciences)

This study's objective was to determine if the amount of light a tree receives would affect its chlorophyll content and photosynthetic efficiency. To test this, three Quercus imbricaria trees that had differing amounts of light available to them (100% shaded, 50% shaded and 0% shaded) were sampled using the PhotosynQ device. Ten samples from four quadrants from each tree were taken. The statistical analysis of this data included a one way ANOVA to detect significant differences in chlorophyll content and photosynthetic efficiency between the trees and quadrants, in addition to a correlation test between light intensity and linear electron flow, which shows each tree and quadrant's efficiency. The ANOVA results exhibited no difference in both chlorophyll content and photosynthetic efficiency between the three trees; however, the ANOVA also revealed that there was a significant difference for both chlorophyll content and photosynthetic efficiency between the four quadrants of the trees. Additionally, the correlation test indicated that both tree 2 and tree 3, 50% shaded and 0% shaded respectively, were more efficient in photosynthesis than tree 1 (100% shaded). This correlation test was also conducted on the different quadrants and yielded the conclusion that the northeast quadrant was most efficient. In conclusion, it was found that light intensity has little to no effect on the chlorophyll content and photosynthetic efficiency of the trees studied and only a small difference was found within the quadrants. This study contains important information that can aid in growing trees more efficiently in highly deforested areas.

URA RAIN GARDEN IN PRAIRIE ECOSYSTEM
Meg Kargul
Category: Plant Sciences, Section 2
Poster: 475
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Anna Groves (Plant Biology)

Rain gardens are used to take in and stop the spread of pollutants (such as nitrogen, phosphorus, sediment, and heavy metals) from water runoff created by high precipitation levels in a short duration in urban areas (Novotny and Olem 1994). The gardens consist of native trees, shrubs, herbaceous plants, and a mulch layer in a shallow depression that help to retain soil moisture and eliminate standing and runoff water. The type of plants utilized corresponds to their ability to survive in each zone of saturation in the rain garden. Plots were created to test the plant survival and success in various precipitation treatments. The wet treatment plots were looked at to help determine why species success occurs in a highly saturated zone in a rain garden. The determinate for plant species success in highly saturated zones is dependent on either higher germination, higher survival rates, or more overall size growth.

CHEMICAL COMPOSITION OF A PLANT
Jacob Crabtree
Category: Plant Sciences, Section 2

Poster: 476
Location: Engagement Center
Time: 1:00 PM-3:00 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

The purpose of this study is to identify any variation amongst the chemical composition throughout the different parts of a plant. By identifying which elements are more prevalent in specific areas of the plant, we could potentially gain further insight on the functions of the plants organs, the chemical processes which the plant conduct, and the way plants interact with their environment. In order to do this, I will be obtaining samples from the MSU greenhouses from different parts of a plant (i.e. stem, root, seed, ect.) and using EDS technology to evaluate the chemical compositions of these different samples. Then I will compare the results for each sample to one another to determine if there is significant variation in the relative abundances of the different elements throughout the plant body. I will then couple this information with further research on ecology, plant function, and molecular biology in order to make some predictions about why the elements are concentrated in the areas they are, how it may benefit the plant evolutionarily, and how it may affect other organisms in the plants ecosystem. This research may then be the foundation for further study on chemical compositions in other plants and how they compare to one another: the differences amongst different genus, families, or even populations, which could be the key to determining the next fundamental piece of the evolutionary puzzle.

PSYCHOLOGY

POSTER PRESENTATIONS, SECTION 1
LAKE HURON ROOM, 9:00-11:00 AM

THE BENEFITS OF ACUTE BOUTS OF EXERCISE ON LONG-TERM MEMORY
Cory Fleck, Chelsea Johnson
Category: Psychology, Section 1
Poster: 479
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Kimberly Fenn (Psychology)

With an increased prevalence of sedentary behaviors in industrialized societies, a growing body of literature has begun to explore the effects of exercise on cognition. Previous studies have found that a higher level of overall fitness lead to improved memory consolidation. The purpose of this study was to examine the effects of a single bout of exercise on long term memory consolidation. In Experiment 1, participants studied word pairs during their training session and were tested on them twelve hours later. We asked participants to wear a heart rate monitor during the day to measure heart rate intensity, and to attend either a high intensity or low intensity kinesiology class between the study and test phases. There was not a significant effect of exercise condition. However, we divided participants based on heart rate, and found that recall performance was better if participants had an elevated heart rate of over 120 bpm for a ten-minute period during the day than if they did not reach this level of activity. In Experiment 2, participants completed the same basic procedures, but we did not manipulate what they did over the course of the day. We found that individuals who spent more time at sedentary heart rate intensities throughout the day demonstrated poorer long-term memory performance than those that reached higher levels of heart rate intensities. These findings suggest that acute exercise may help memory consolidation and that sedentary behaviors could hinder cognitive performance.

A BEHAVIORAL AND NEUROPHYSIOLOGICAL INVESTIGATION OF EFFORTFUL CONTROL IN YOUNG CHILDREN
Brianna Jecmen
Category: Psychology, Section 1
Poster: 480
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): C Emily Durbin (Psychology)

Effortful control (EC) involves self-regulatory behaviors and abilities such as suppressing a dominant response to perform a subdominant one, which are necessary for planning and detecting errors (Rothbart & Rueda, 2005). One of the most commonly studied event-related potentials (ERP) thought to index these skills is the N200. The N200 is thought to reflect response inhibition and/or conflict monitoring. However, most of the research on the relationship between the N200 and EC used older children or clinically based samples. As EC is developing most rapidly during early childhood, understanding the underlying neural processes during this time is important. This study aims to expand the literature by examining the associations between neural markers and behavioral indicators of EC in typically developing young children. Participants include a community sample of children aged 3 to 7 (N=65) who completed the Laboratory Temperament Assessment Battery (Lab-TAB; Goldsmith, Reilly, Lemery, Longley, & Prescott, 1995) and performed a developmentally appropriate go/no-go task while electroencephalograph (EEG) data was recorded. Bivariate correlations will be used to test the association between the N200 and behavioral measures

of EC. It is expected that children with lower EC will make more errors on the go/no-go task and have reduced N200 amplitudes compared to children with higher EC.

RESILIENCE RELATED CONSTRUCTS: IMPLICATIONS OF FOR ACADEMIC ACHIEVEMENT AND PERSISTENCE
Ashlyn Lowe
Category: Psychology, Section 1
Poster: 481
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Ann Marie Ryan (Psychology)

Understanding the antecedents to academic achievement and persistence is important to designing interventions to help students succeed in college. This study sought to investigate multiple potential predictors to determine their total and relative influence on achievement and persistence. Participants, 467 students at a Midwestern University, completed five different non-cognitive measures: grit, resilience, hardiness, locomotion, and procrastination. We then gathered information about their academic successes and level of persistence. Multiple linear regression and relative weights analyses were used to assess the relationships of these expected predictors to achievement and persistence. In this presentation I will demonstrate how well this set of non-cognitive antecedents works to determine achievement and persistence, as well as which factors best predict these desired outcomes. Implications and conclusions will be discussed.

PREVIEWING DISTRACTORS IMPROVES CHANGE DETECTION IN A CHANGE BLINDNESS PARADIGM
Monique Daignault
Category: Psychology, Section 1
Poster: 482
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Mark W Becker (Psychology), Devin J McAuley (Psychology)

When a visual change occurs during steady viewing it produces a transient that attracts attention, thereby allowing an observer to notice the change. If, however, a change occurs simultaneously with the onset of a set of distractors, the distractors also produce transients that compete for attention and the change becomes difficult to detect, resulting in “change blindness” (O'Regan, Rensink & Clark, 1999). Becker and Vera (2007) found that change blindness is dramatically reduced if the distractors flash 14 times before appearing with the change. Here we further investigate how previewing distractors improve change detection. In Experiment 1, we systematically varied the number of preceding distractor flashes to investigate how this recovery from change blindness develops over repeated exposure to the distractors. Surprisingly, a single preview flash of the distractors was sufficient to improve change detection. Furthermore, change detection improved little as the number of preview flashes increased from one to eight. Thus, the recovery does not seem to be due to increasingly adapting to flashing distractors. In experiment 2, we varied the delay between a single preview flash and the change. Results showed a significant linear trend as a function of preview to change delay with better detections for shorter delays and a detection benefit lasting to a 1600ms delay. Taken together, these results suggest that the recovery from change blindness relies on a type of visual marking that can effectively reduce attention capture of subsequent distractors; however this distractor suppression has a limited time course lasting about 1600ms.

HELPING GRADUATES SUCCEED: A STUDY OF PROXIMAL AND DISTAL FACTORS IN JOB ATTAINMENT
Glen Gagnon, Aiya Jweihan
Category: Psychology, Section 1
Poster: 483
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Ann Marie Ryan (Psychology)

College labor-market entrants are motivated to secure career-relevant employment post graduation. The job search literature has identified distal and proximal factors that are related to job search success. The purpose of this study is to further examine proximal and distal factors that contribute to successful or unsuccessful post-university job placement for graduating seniors. Utilizing a survey of graduating seniors that sought full-time employment, we captured demographic and behavioral measures across eight time points at two-week intervals. This study will utilize descriptive and inferential means to illuminate the significant relationships of job-seeking behaviors and patterns. With this data, we hope to identify the critical aspects of interplay between student perceptions, temporal factors, trait affects, and subsequent behaviors. We conclude our research with suggestions for future research and implications for practice.

PROBING THE NEURAL BASES OF BEAT PERCEPTION USING NEURONAVIGATED TRANSCRANIAL MAGNETIC STIMULATION
Courtney Cox
Category: Psychology, Section 1
Poster: 484

Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Florian Kagerer (Kinesiology), J Devin McAuley (Psychology)

There is accumulating neuroimaging evidence that perception of a regular beat while hearing an auditory rhythm engages a sub-cortical and cortical network that includes the basal ganglia, supplementary motor area (SMA) and pre-motor regions (Grahn & Brett, 2007; Grahn & McAuley, 2009). The previous study used transcranial magnetic stimulation (TMS) to investigate the causal role of the SMA in internal beat generation. Participants received TMS over either the SMA or a control location while completing an ambiguous tempo task previously shown to reveal robust individual differences in perception of an implied beat. In this task, participants listen to two types of sequences, control and experimental, and judge whether the sequence is 'speeding up' or 'slowing down'. TMS over the SMA was found to have a facilitative effect on decision times, supporting the involvement of the SMA in beat perception. The effect was greater on individuals who, in a pre-test, were found to have weaker sensitivity to an implied beat. Facilitation was also greater for the unambiguous +20% condition than the ambiguous -20% condition, resulting in faster decision times, which is consistent with the use of a real-time criterion in making temporal judgments (Kristofferson, 1977). The current study used neuronavigated TMS and the same ambiguous tempo task to elucidate further the facilitative effect of TMS over the SMA, and consequently, the role of the SMA in internal beat generation.

CHANGE DETECTION IS BASED ON VISUAL RATHER THAN CONCEPTUAL CODES
Allegra Schiff
Category: Psychology, Section 1
Poster: 485
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Mark Becker (Psychology)

Change detection tasks have been used extensively to explore the relationship between attention and visual cognition. These experiments have produced results suggesting that attention to the change object is integral in detecting change. This suggests that change detection involves a relatively high-level representation that only occurs post-attentively. Little research, however, has been done to directly examine whether change detection relies on lower-level visual representations versus more abstract, conceptual. To investigate this issue, we ran two experiments to distinguish between the uses of these two types of representations. In both experiments, we used numbers as our stimuli in the change detection task. In the first study, we systematically varied the visual change between the initial stimulus and the post-change stimulus while keeping the magnitude of the conceptual change (numerical distance) between pre-and post-change stimuli constant. In the second study, we did the opposite. We systematically varied the magnitude of the conceptual change (numerical distance) between pre- and post-change digits while keeping the visual change magnitude constant. We found a clear connection between magnitude of visual change and change detection performance; performance improved as the magnitude of visual change increased. The effect of magnitude of conceptual (numerical value) change on change detection ability, however, has little impact on change detection performance. These results suggest that the representation mechanisms used during change detection task are low-level visual codes rather than higher-level conceptual representations.

POSTER PRESENTATIONS, SECTION 2
LAKE HURON ROOM, 9:00-11:00 AM

SELF-ASSESSMENT OF FITNESS AND EXERCISE ENJOYMENT OVER TIME IN A CYCLING EXERGAME
Courtney McClure, Shilpa Sabbani, David Zaran
Category: Psychology, Section 2
Poster: 488
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Deborah Feltz (Kinesiology), Emery Max (Kinesiology), Stephen Samendinger (Kinesiology)

Purpose: The purpose of this study was to examine how initial assessments of fitness correlated with exercise enjoyment. We hypothesized that participants who believed they were in good shape would enjoy the game more than participants who ranked themselves lower on a fitness scale. Method: College-aged male and female participants (N = 41) first completed a graded exercise test on a stationary cycle ergometer to determine HRmax. Next, participants completed 12 non-consecutive exergame workouts at a fixed wattage eliciting 75% of their HRmax. Prior to the first workout, participants completed a survey detailing their typical exercise behaviors. Participants were also surveyed after each workout on their overall enjoyment of the exergame. Results: Preliminary data analysis suggests that pre-study perceptions of fitness significantly correlated with their reports of exercise enjoyment on their first day of exercise ($r(41) = .40$, $p = .01$) but that correlation decreased over time ($r(41) = .17$, $p = .29$). Discussion: Individuals who believe they are in good physical shape seem to enjoy a cycling exergame initially. However, as participation continues over the course of 4 weeks, this relationship decreases, perhaps because those who thought of themselves in lesser shape saw improvements and enjoyed the exergame more, while those who perceived themselves in good shape may not have felt as challenged over time. *National Institutes of Health (1R21HL111916-01A1)*

PRACTICAL RECOMMENDATIONS FOR EXERGAME DEVELOPMENT: AN ANALYSIS OF USER FEEDBACK
Nicole Debellis, Nicole Lemmen, Treyce Sanderson
Category: Psychology, Section 2
Poster: 489
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Deborah Feltz (Kinesiology), Emery Max (Kinesiology), Stephen Samendinger (Kinesiology)

Purpose: The purpose of this study, as part of an NIH funded project, was to test the Kohler effect (a motivation gain from working with a superior partner in an interdependent task) in an active video game (AVG) with a software generated partner (SGP) and review user feedback, post study. Feedback was used to help revise gameplay and further enhance motivation in AVGs. Methods: College students and community members (N = 73) completed a baseline fitness test and then played an AVG on a stationary cycle either alone or with an SGP for 12 days over the course of a month. Upon completion of the study, participants provided open-ended feedback on their gameplay experience. Results: An analysis of open-ended participant feedback revealed several themes. Participants desired a more believable partner, a richer gameplay experience, and increase in the amount of partner interaction. Improvement in these areas in future AVGs may enhance the exercise experience and improve motivation and enjoyment during gameplay. National Institutes of Health (1R21HL111916-01A1)

GENDER DIFFERENCES IN CHILDREN'S TEMPERAMENT TRAITS
Devin Boyle
Category: Psychology, Section 2
Poster: 490
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Catherine Durbin (Psychology)

Gender differences in temperament traits have been an important topic to evaluate when studying children's emotions. Previous researchers studying gender differences in children's temperament traits have provided information showing differences between boys and girls, but continue to use one form of assessment, such as parental-report or self-report measures, to draw their conclusions. The lack of using multi-assessment methods can provide inaccurate results because it can be subjected to sociocultural or gender biases. Using two different measures of assessment through the completion of 16 laboratory tasks and maternal and paternal reports, the current study evaluated temperament traits in 277 boys and girls ages 3-7 years old. The Rothbart's Child Behavior Questionnaire were given to the child's mother and father to assess the child's emotions, and trained coders recorded the child's emotional states and completed the global ratings of the child's behavior. Independent sample t-tests were used to compare boys and girls on mean levels of traits.

PRENATAL TESTOSTERONE EXPOSURE DOES NOT INCREASE AGGRESSIVE AND ANTISOCIAL BEHAVIORS IN HUMANS: AN OPPOSITE SEX STUDY.
Kailie Kipfmiller, Megan Donohue
Category: Psychology, Section 2
Poster: 491
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): S Alexandra Burt (Psychology), Kelly Klump (Psychology)

Prenatal exposure to testosterone has been shown to masculinize both animals and humans. Prior research indicated that opposite-sex female twins show higher levels of aggression than same-sex pairs; however, the sample size was small and most twins were mid-or-post pubertal age. This study sought to extend this work by evaluating whether prenatal exposure to testosterone increases antisocial behaviors in children. A large sample of same-sex and opposite-sex twins 3 to 10 years of age (N= 4,370 twin pairs) were examined from the Michigan State University Twin Registry. To adjust for the non-independence of twins within families, we used the hierarchical linear models (HLMs). Our outcome measure was the Conduct Problems Scale from the Strengths and Difficulties Questionnaire. Twin sex and co-twin sex were entered as predictor variables (female=-1, male=1). Results revealed a significant effect of twin sex such that males engaged in higher levels of conduct problems than females (fixed effect estimate=-.32 (.07); $p<.001$), but there was no effect of co-twin sex (fixed effect estimate=.05(.07); $p=.13$). We re-examined a subset of the above twins (N=938 twin pairs) who participated in a study of childhood conduct problems between ages 6 to 10. We examined mother-, father-, and teacher-reports of physical and social aggression using the Subtypes of Antisocial Behavior Scale and the Achenbach Family of Instruments. Again, the results were identical (not shown here). There is little-to-no evidence of organizational effects of testosterone on aggression/antisocial behavior prior to puberty.

ASSERTIVE IMPRESSION MANAGEMENT TACTICS IN THE INTERVIEW: DIFFERENCES IN EFFECTIVENESS BY GENDER AND RACE
Dominik Isham
Category: Psychology, Section 2
Poster: 492

Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Ann Marie Ryan (Psychology)

Prior research shows gender and race stereotypes affect evaluations in interviews. Interviewees may use impression management (IM) tactics to help reduce the negative effects of stereotypes. This study's central focus is to investigate the differences in the effectiveness of assertive identity management tactics across gender and race. Participants were shown a video of a scripted interview and were asked to evaluate the interviewee. Interviewee gender, race, and specific impression management strategy used were manipulated. The results will be examined using an Analysis of Variance (ANOVA). This research can be used to help combat negative stereotypes that may result in lower evaluation scores in interviews despite those applicants having an equally or more qualified candidate.

BLACK TEST TAKERS' RESPONSES TO VIDEO-BASED SJTS FEATURING WHITE ACTORS: THE ROLE OF ATTITUDES AND BACKGROUND EXPERIENCES
Nicole Racine, Macrina Cipa
Category: Psychology, Section 2
Poster: 493
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Juliya Golubovich (Psychology), Ann Marie Ryan (Psychology)

Situational judgment tests (SJTs) consist of hypothetical scenarios in the workplace to which test takers respond (i.e., what you say you would do in a given scenario). SJTs are a valuable tool because they allow for a valid and fair evaluation of job applicants. More specifically, video-based SJTs are more interesting for test takers as they are able to watch a scenario and hear it as opposed to reading a description of it. A difficult obstacle is casting these videos. Research shows that participants constantly recognize the race of the actors who appear in the videos and this can influence their test responses (i.e., their preferred course of action in response to a situation) and reactions to the test (e.g., does the test seem relevant for the target job). The goal of this study is to better understand how Black individuals respond to White actors in an SJT. Participants' main task in this study is to watch four video-based scenarios between White coworkers (actors) and to indicate how they would respond to each situation if they were to take the role of one of the coworkers. We examine how Black participants respond to questions about their reactions to the test, their attitudes about prejudice, and past experiences with diversity. We expect that reactions to the test will be more positive among Black respondents who are more motivated to act without prejudice toward other racial groups and among those with more experience interacting with White individuals in the past.

EFFECTS OF EXPLANATION STRATEGIES ON HIRING THOSE WITH CRIMINAL RECORDS
Lauren Winslow
Category: Psychology, Section 2
Poster: 494
Location: Lake Huron Room
Time: 9:00 AM-11:00 AM
Mentor(s): Ann Marie Ryan (Psychology)

An extant literature within selection has focused on understanding the factors that shape how raters judge candidates. This study contributes to this body of research by examining how raters judge job candidates with criminal backgrounds. Previous research we have done suggests that characteristics of the crime and job impact judgments of job relatedness of criminal records in hiring decisions. The aim of this study was to examine to what extent certain explanations strategies could influence raters' perceptionsof individuals with a criminal background. We utilized a 2 (job-type) X 2(crime-type) X 4 (explanation) mixed design. We posit that different explanation strategies (e.g., excuse, explain, apologies) will have implications for the ways in which the rater reacts to the candidate. Further, we propose affective, motivational, and cognitive mechanism that may explain why the different explanation strategies relate to evaluation outcomes. Our findings will be discussed in terms of its implications for educating and training job seekers with criminal backgrounds.

POSTER PRESENTATIONS, SECTION 3
BALLROOM, 1:00-3:00 PM

NEUROTICISM MODERATES THE RELATIONSHIP BETWEEN FEAR OF CRIME AND QUALITY OF LIFE
Isabel Silverstein, Paige McKeon
Category: Psychology, Section 3
Poster: 503
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): S Alexandra Burt (Psychology)

Fear of crime refers to an individual's fear of being a victim of crime, but is not usually an accurate perception of the actual

probability of being a victim of crime. Fear of crime influences many aspects of public and private life, and the effects of which can be either adaptive or maladaptive. Previous research suggests that fear of crime is associated with lower quality of life, but this association is not robust across studies. Therefore, moderating and mediating variables should be examined when exploring the impact of fear of crime on overall life satisfaction and well-being. One such moderating variable may be individual personality traits, particularly neuroticism and conscientiousness, as they have been consistently associated with perceived life outcomes. In this study, a community-based sample of adults living in disadvantaged neighborhoods across the state of Michigan (N=1729) completed the Fear of Crime Questionnaire, Miniature International Personality Item Pool, and Satisfaction With Life Scale. A moderated regression analysis indicates that the relationship between fear of crime and quality of life is moderated by the personality trait of neuroticism only. These results help explain inconsistencies in previous research, improve our understanding of the function of fear of crime for individuals living in at-risk neighborhoods, and promote further research into predicting and improving an individual's quality of life.

MODERATION OF FEAR TO GUN OWNERSHIP: SEX AND AGGRESSION
Ashlyn Lowe
Category: Psychology, Section 3
Poster: 497
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Alex Burt (Psychology)

With an increase in speculation about the safety and intentions of gun ownership, people have begun to ask who owns guns and why: what motivates individuals to purchase firearms? Previous research has found that sex, physical aggression, and fear of crime have independently influenced gun ownership, but to our knowledge, studies have not been done on how these variables interact to more specifically predict gun ownership. In order to get a better understanding of this increasingly hot topic, we investigated not only if fear of crime predicted gun ownership, but also whether sex and/or physical aggression moderate this relationship. Using a sample of community-based adults living in "at-risk" neighborhoods (N=1729), participants completed the Subtypes of Antisocial Behavior and Fear of Crime Questionnaires. We analyzed our results using moderated regression analysis. In this presentation I will analyze whether sex and aggression influence the relationship between fear of crime and gun ownership. Implications and conclusions will be discussed.

TECHNOLOGY TRUMPS PRINT: MEMORY IS GREATER FOR INFORMATION ACQUIRED FROM THE INTERNET THAN A BOOK
Sarav Shah, Diana Jasser, Alana Page
Category: Psychology, Section 3
Poster: 498
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Kimberly Fenn (Psychology)

There is a popular concern that Internet use diminishes memory and attention. Furthermore, individuals often believe that they learn and retain information worse from an electronic source than from a printed medium. However, little is known about whether using the Internet to obtain information actually influences learning or memory. In this study, we are interested in how the medium of information affects immediate memory and how it affects the stability of memory across time. We examined memory for identical information learned either from the Internet or a book, immediately and after a 24-hour retention interval. Participants completed an acquisition phase and a surprise test phase. In the acquisition phase, participants answered questions about animals using either a website or a book that contained the exact same information. During the surprise test phase, participants were given the exact same questions and were asked to recall the information they previously learned. Participants then completed a survey to assess confidence in their memory for the information. Contrary to popular belief, we found that participants who learned from the Internet showed superior recall of information than those who learned from the book, both immediately and after 24 hours. Participants in both conditions showed equal confidence in their ability to recall the information. This research reveals that rather than damaging memory, the Internet may actually hold advantages for memory retention over traditional print mediums, and that this effect endures over time.

PRE-SERVICE TEACHER ATTITUDES TOWARDS A CHILD WITH AUTISM
Kelsey Napier
Category: Psychology, Section 3
Poster: 499
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Brooke Ingersoll (Psychology)

Autism spectrum disorder is a developmental disability defined by deficits in social communication and interaction, as well as repetitive behavior and interests (NIMH, 2014). The rate of children with autism is increasing rapidly it is expected both regular and special education teachers will be more likely to encounter a child with autism in their classroom (NIMH, 2014). With this potentially high amount of interaction, it is crucial to understand the factors, which constitute teacher's attitudes regarding

children with ASD. Positive teachers' attitudes towards a student have been shown to affect the students' performance in school, and encourage the inclusion of the child into the classroom (Park and Chitiyo, 2011). Understanding the factors which compose teachers' attitudes towards children with autism may help develop better methods for training teachers to become more effective at providing interventions and education for children with autism (Park, Chitiyo, and Choi 2010). The researchers are particularly interested in pre-service teachers since they are developing their ideas regarding children with special needs, as well as gaining specialized training and experience (Park, Chitiyo, and Choi, 2010). The researchers predict pre-service teachers with higher levels of empathy, higher levels of self-efficacy, more accurate knowledge, better sources of information, more prior experience, and special education major students would have more positive attitudes towards children with autism. The goal of the study is to examine these factors and their impact on teacher attitudes towards a child with autism.

THE EFFECTS OF GENDER STEREOTYPES ON FALSE MEMORY
Cory Fleck
Category: Psychology, Section 3
Poster: 500
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Kimberly Fenn (Psychology)

Gender stereotypes are extremely powerful and influence social interactions as well as views of other people. Furthermore, gender stereotypes have been shown to increase false memory in word association tasks, with a higher false recollection for stereotypically related words. However, there has not been a study investigating how the gender of a source of information can influence memory. In the current study, we investigated the effect of gender-based false memory by asking participants to read information that was purportedly written by either a man or woman. Importantly, we varied whether the author was stereotypically associated with the material they were presenting. Participants read an article that discussed a subject stereotypically associated with either males (footballs) or females (cosmetics). They then read a response to the article purportedly written by either a male or a female that contained information that directly contradicted the original article. We utilized a 2x2 between subjects design with article subject (cosmetics or footballs) and purported sex of the response author (male or female) as independent variables. After reading the response, we tested participants' memory for the original article. We expect that participants will be more likely to integrate false information into memory if it comes from a source who is stereotypically associated with the topic of the response (i.e. a male writing about footballs or female writing about cosmetics). This would suggest that when people gather information from sources like news sites, stereotypes about the person presenting information could influence how people encode that information.

INTERSECTIONALITY
Nicole Racine, Mackenzie Twomey
Category: Psychology, Section 3
Poster: 501
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Danielle King (Psychology), Ann Marie Ryan (Psychology)

In this study, we examined the effectiveness of verbal identity management (IM) strategies in interviews when individuals' intersecting social categories are considered (intersectionality). We examined the interview styles of women with an agentic identity management style, which is an assertive IM style. We are studying this specific identity management style across ethnic groups of African American women and Caucasian women. We examined perceived competence, qualification, and fit score of the applicant. Our sample population consisted of 99 students at a Midwestern University whose mean age was 19 years old. Of that sample, 62% were female and 72% were Caucasian. Participants watched videos of actors answering interview questions when applying for an engineering leadership position using an agentic identity management strategy or no identity management in a control condition. Participants then completed measures of our outcome variables of interest. Results indicated differences on outcome variables for the different ethnic groups of women when using agentic IM strategy and the non-IM strategy. African American women were rated higher on fit for the engineering leadership position; Both African American and Caucasian women's fit scores were higher in the agentic condition compared to the control condition. Caucasian women were rated higher on qualification score and competence in the agentic condition, but lower than African American women in the control condition. Using an agentic strategy increased ratings on these perceptions for Caucasian woman and decreased them for African American women. In this presentation we will further discuss results, implications, and conclusions of this study.

VARIATIONS IN BOLDNESS AND SUBMISSIVE BEHAVIORS IN CROCUTA CROCUTA
Danielle Miles
Category: Psychology, Section 3
Poster: 502
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Kay Holekamp (Zoology), Susan Ravizza (Psychology), Julie Turner (Zoology)

Differences in personality measures for boldness, aggressiveness and sociability have been shown in spotted hyena (Crocuta crocuta) individuals. Rank and heritability of traits sometimes account for these variances, but as more studies show the effects of behavioral differences on life history and fitness, the basis of traits are also being further explored. Previous inquiries have shown that in spotted hyenas, the most fit individuals have intermediate boldness and that the trait is weakly heritable. Much less exploration has been completed for the unprovoked submissive actions observed across ranks in spotted hyenas. To better understand more of the variation in boldness and unsolicited appeasement behaviors, the Social Niche Specialization Hypothesis will be tested. Adult boldness was measured through field experiments video recording responses to a life-size model hyena and through naturally-occurring demonstrations of boldness around lions, one of the major causes of hyena mortality. In lion-hyena interactions over food, the closest distances an individual hyena gets is recorded.With further analysis between spotted hyena clans in distinctive ranges of the Masai Mara National Reserve, hopefully more insight can be gained on how anthropogenic presence effects boldness and other behavioral responses in a gregarious carnivore.

POSTER PRESENTATIONS, SECTION 4
BALLROOM, 1:00-3:00 PM

LITERARY NEUROSCIENCE: EFFECTS OF LEXICAL ELEMENTS ON ATTENTION AND READING IN JANE AUSTEN'S "MANSFIELD PARK"
Lana Grasser, Savannah Smith
Category: Psychology, Section 4
Poster: 505
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Natalie Phillips (English)

The act of reading is a vital component of human life, from basic social interaction to higher levels of education. Therefore, research on the neuroscience of reading is critical. Previous fMRI studies of reading have only utilized single-word or one sentence texts, as opposed to presenting subjects with full passages as they would be exposed to when reading a novel analytically or casually opening a book for entertainment. The Digital Humanities and Literary Cognition lab at MSU has sought to study reading by presenting full paragraphs of text, allowing participants to read at a natural pace that better mirrors natural reading. This pioneering fMRI experiment examined two modes of attention: analytical close reading and casual pleasure reading. After the scan, subjects wrote essays on the close reading sections presented in the fMRI scanner. This unique data set has shown remarkable patterns of quoting directly and indirectly from the text. The Brysbaert Database of 40,000 word-lemmas and the Coh-Metrix database has enabled assessment of concreteness, readability, and familiarity of the passages subjects read, in addition to numerous other lexical elements. Our quoting data from the essays is rich with references to highly concrete moments and emotional negativity. Continual analysis of Austen's narrative shows early signs of correlation between literary elements of alliteration, spatial references, modified nouns, and action verbs in relation to increased attention whilst reading. Studying the complexities of reading allows us to understand how the mind remembers and learns, along with broadening horizons for the future of literature.

THE RELATIONSHIP OF WORRY TO DYSPNEA, DEPRESSION, AND INSOMNIA SYMPTOMS IN PATIENTS UNDERGOING TREATMENT FOR ADVANCED LUNG CANCER
Alwin David
Category: Psychology, Section 4
Poster: 506
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Rebecca Lehto (Nursing)

Worry, recursive cognitions associated with anxiety that stem from perceived threats, is frequent among cancer patients. Research has found that high worry influences illness perceptions towards threatening interpretations, while requiring directed attention to inhibit. Little research has explored worry relationships to cognitively-mediated symptoms like dyspnea, depression, and insomnia in lung cancer. This study was to determine relationships of worry to dyspnea, depressive, and insomnia in lung cancer patients undergoing treatment. The sample included 40 patients [age: 66.2+9.4 years; sex: 27(67.5%) females, 13(32.5%) males; disease stage: III, 10(25%); IV, 30(75%)]. Instruments included worry questionnaires [General (mean 6.53+3.82, range 3-12); Cancer-Related(mean 8.93+3.94, range 3-15], Cancer Dyspnea Scale [mean 19.7+7.38, range 12-42], CESD-Depression [mean 21.3+10.05, range 8-53], Pittsburgh sleep inventory (quality: mean 12.55+7.54, range 0-25; symptoms: mean 8.45+7.34, range 0-27). Statistics included descriptives, correlational and regression analyses. Results showed significant correlations between general worry and age(r= -42,p<.05), dyspnea(r =.40,p<.05), depression(r=.70,p<.005), sleep quality(r=.32,p<.05), and sleep symptoms(r=.52,p<.005). Cancer-related worry was associated with dyspnea(r=.36,p<.05), depressive symptoms(r =.56,p<.005) and sleep quality(r=.32,p<.05). Multiple regression found cancer-related worry was predictive of depressive symptoms(R=.56,B =1.43,p<.005), dyspnea(R=.37,B=.67,p<.05), and sleep quality(r=.32,B=.62,p<.05), but not sleep symptoms. General worry was predictive of dyspnea(R= .40,B=.78,p<.05), depression(R=.70,B=1.8,p<.005), sleep

symptoms (R=.53,B=.90,p<.005), and quality(R=.32,B=.64,p<.05). Worry is a significant problem in advanced lung cancer. Both general and cancer-specific worries were associated with dyspnea, depression, and insomnia. Given recognition that breathing difficulties, psychological distress, and inadequate sleep negatively impact quality of life, targeted worry assessment/interventions are recommended.

FACTORS CONTRIBUTING TO INDIVIDUAL DIFFERENCES IN SPEECH UNDERSTANDING IN NOISE
Emily LaPlante, Alwin David, Jayson Winsor
Category: Psychology, Section 4
Poster: 507
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Elisa Fromboluti (Psychology), Katherine Jones (Psychology), J Devin McAuley (Pyschology)

Aging is a process everyone undergoes, and while its effects on the body can be easily observed, those taking place within the brain are less apparent. The goal of the current investigation is to examine how age-related changes and individual differences in attentional entrainment and basic auditory abilities may contribute to speech-in-noise understanding across the lifespan. The current presentation will focus on preliminary data from participants in the 18-30 range for a sub-set of tasks from a larger battery related to speech-in-noise perception and entrainment abilities. Participants will complete a hearing test, followed by two speech-in-noise understanding tests in which participants repeat words or sentences presented with different levels of background noise. Then, participants will complete tests assessing entrainment ability, including a synchronize-continue task where participants tap along with an auditory pacing signal and continue after the stimulus ends; a task in which participants tap as fast and as slow as possible, maintaining an isochronous rhythm; a task where participants hear and rate a range of tempos; and a task in which participants tap at their preferred tempo. Preliminary data from these tasks will allow us to investigate how auditory entrainment abilities may contribute to individual differences in speech-in-noise understanding. Based on the hypothesis that entrainment abilities may enable listeners to track temporal patterns in speech and allow them to use that information to predict the timing of subsequent speech events, increasing speech-in-noise understanding, we predict individual abilities on the entrainment and speech understanding tasks will be positively correlated.

CORRELATES OF OBSERVED CHILD COMPLIANCE
Carson Tabiolo
Category: Psychology, Section 4
Poster: 508
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Catherine Emily Durbin (Psychology)

Current literature of compliance and its precursors is vast and looks closely at unchangeable characteristics that a child may possess, their sex for example, and states of relationships that precede compliance. Some other studied precursors include the age of the child, parent(s) reports of the child's temperament, and the quality of the parent – child relationship. However, this study aimed at scrutinizing laboratory observed traits like effortful control and fear of authority by both experimenters and parent(s) to correlate with higher compliance. There were 277 children who participated in this study aged 3 to 7 years old. The children and their families were recruited from the surrounding Lansing, Michigan area.

SEX DIFFERENCES IN CYTOGENESIS IN THE NUCLEUS ACCUMBENS OF PUBERTAL RATS
David Lozano
Category: Psychology, Section 4
Poster: 509
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Cheryl Sisk (Psychology)

During adolescence, many brain regions experience restructuring, including the nucleus accumbens (NAc), to facilitate the development of adult-typical behaviors. The NAc has a significant role in the neural circuitry involved in processing reward, pleasure, and motivation. Furthermore, a sex difference in reward-related processing and motivation seems to emerge during puberty. Previous studies have shown that new cells are added to the NAc during adolescence, which could be a potential mechanism related to changes seen in motivational behavior and reward-related processing. In the current study, we investigated whether there were sex differences in pubertal cytogenesis in the NAc and we also phenotyped these newly generated cells. Six male and female juvenile rats were injected three times with bromodeoxyduridine (BrdU), a cell birth date marker, on postnatal day 30 (P30) and sacrificed on P51. The brain tissue underwent triple-label immunofluorescence to stain for NeuN, a mature neuronal marker, GFAP, an astrocytic marker, and BrdU. The NAc shell, NAc core, and anterior commissure were analyzed to examine differences in BrdU+ cell density, as well as BrdU/NeuN and BrdU/GFAP colocalization between the sexes. The data will be used to show if pubertal cytogenesis and cell differentiation differ as a function of sex in all regions of interest.

DISPOSITIONAL MINDFULNESS AND GROWTH MINDSET ENDORSEMENT: UNIQUE AND INTERACTIVE IMPACTS ON ANXIOUS AROUSAL
Sean Roberts, James Finch
Category: Psychology, Section 4
Poster: 510
Location: Ballroom
Time: 1:00 PM-3:00 PM
Mentor(s): Jason Moser (Psychology)

It has been shown that mindfulness or present moment awareness of one's thoughts, feelings, and sensations is protective against physical and mental distress. Basic beliefs about the self (believing that certain attributes can change) have also been shown to be protective against psychological problems. However, few studies have evaluated how these two protective factors interact in their relation to distress. In this study, we aimed to address this question by examining how both trait mindfulness (awareness of thoughts, feelings, and sensations) and growth mindset endorsement (the belief that self-attributes are malleable) related to physiological anxiety symptoms (anxious arousal). Two hundred and ten female participants completed the Mindfulness Attention Awareness Scale (MAAS), Implicit Theories Questionnaire (ITQ), and the Mood and Anxiety Symptom Questionnaire – Anxious Arousal subscale (MASQ-AA). Linear regression was conducted with the MAAS, ITQ, and their interaction entered as independent variables and the MASQ-AA entered as the dependent variable. A significant interaction suggested that growth mindset endorsement related to less anxious arousal, particularly for those with low trait mindfulness. This could be because the belief that anxiety can change breaks the self-perpetuating cycle that may arise when an individual is anxious about their anxiety and lacks the self-awareness to realize it. Taken together, these findings suggest that the treatment of anxiety using mindset interventions is especially effective for individuals who have low trait mindfulness. Our study also suggests that a more integrative approach to understanding protective factors against psychological distress may be fruitful.

SOCIAL SCIENCE: GENERAL

ORAL PRESENTATIONS, SECTION 1
MSU ROOM, 9:00-10:30 AM

ESTABLISHING LOCALIZED "RECYCLED CONSTRUCTION MARKETS"
Evan Paul
Category: Social Science: General, Section 1
Location: MSU Room
Time: 9:00 AM-9:15 AM
Mentor(s): Rex LaMore (Outreach and Engagement Partnerships), Matt Syal (Planning, Design, and Construction)

Property abandonment and blight is a dangerous issue that can be found in many cities today. A major component of the problem is the continued use of non-sustainable construction practices. Property abandonment and blight can easily take over any city, but it seems to be that big legacy cities have been impacted the most. This horrific issue has the ability to decline the economic and social welfare of a city. Michigan has been dealt a large amount of blight, especially in major cities around us like Detroit, Lansing and Flint. The resulting chain of events that typically occurs in these cities begins with a decline in community population that sparks an economic and/or social decline of the city. The city's economic and social decline will cause even more property to become abandoned, eventually leading to Blight. I began my research looking deeper into recycling and the current construction practices used today. I discovered that merging recycling into everyday localized waste management practices has the potential to bring an array of benefits to the community, but yet recycling still lacks popularity, especially localized recycling programs. The question that my research stems from is, how economically feasible is establishing a recyclable construction industry/market at a local level? I began identifying the Economical & feasibility of the recycling industry and analyzed the current "Recyclable construction materials" sector. I was able to get in contact and have a Q&A with Dan Gilbert and a few members of his Detroit Blight Removal Task Force.

DRUG TREATMENT AND RECIDIVISM RATES
Sara Hughes
Category: Social Science: General, Section 1
Location: MSU Room
Time: 9:15 AM-9:30 AM
Mentor(s): Merry Morash (Criminal Justice)

More than male offenders, a high proportion of women who are criminal offenders suffer from a drug addiction or dependence. Research studies have found that the lack of adequate drug treatment programs are correlated to recidivism rates among offenders. For a sample of 400 women on probation and parole, the present study will examine arrests related to drugs, probation or parole violations related to drugs, and the offender's current use in relation to recidivism. The variable indicating whether or not drug treatment was a requirement of probation or parole will also be examined as a possible predictor of

recidivism. Criminal history will serve as the control variable, since it is the best predictor of outcomes between other variables. The results of this study will help us to better understand the success of drug treatment programs, the context in which they are attended by offenders, and subsequent recidivism rates.

HOW TO DEAL WITH HOOKUP CULTURE
Nickolaus Simon, Tracy Reddington, Jacob Stokes
Category: Social Science: General, Section 1
Location: MSU Room
Time: 9:30 AM-9:45 AM
Mentor(s): Stephanie Amada (Writing, Rhetoric, and American Cultures)

What perspectives do women (and men) have on hookup culture? Do they enjoy the casual, "friends-with-benefits," relationship, or would they rather find someone to date seriously? The goal of the project is to create an online, anonymous forum that allows students to log on and ask questions or give advice from anything ranging from relationships to dating or sex to women's health. Some example questions might be: "What is your definition of hooking up?", "How has your perspective of hooking up changed as a freshman to now?", and "Do you feel more comfortable hooking up after having a few drinks?" Women shouldn't feel pressure to hookup, and should feel empowered by their decisions, whether that is to hookup or not.Nick Simon, Tracy Reddington, Jacob Stokes, and mentor Stephanie Amada will be presenting How to Deal With Hookup Culture on Friday, April 10. The topics we will discuss include: social media presence, anonymous community forum, use of video to answer FAQ's regarding hookup culture, and the definition of hookup culture.

CAMPUS ASSISTANCE WITH MENTAL AND EMOTIONAL HEALTH
Davina James
Category: Social Science: General, Section 1
Location: MSU Room
Time: 9:45 AM-10:00 AM
Mentor(s): Tamara Butler (African American and African Studies)

For my research, I want to look at the available resources to students at Michigan State University for mental and emotional health and compare the demographics within the different communities on campus. Mental and emotional health is something that should be addressed seriously and effectively for all. Depression, aloneness, and suicide are very common issues many college students face. Being of different races, ethnicities and cultures though we may feel more comfortable discussing our issues with those of our own background. However, some may feel that those resources are not completely available to them or possibly not available at all. I want to do a campus survey for all different backgrounds of students to ask questions of how they feel about this situation and how it can possibly be fixed. Have you been to the MSU Counseling Center? How do you feel about the awareness of mental and emotional health on campus? Do you feel safe? Do you feel comfortable? Asking students these questions can perhaps increase awareness at the Office for Inclusion and Intercultural Initiatives and The State News. In the end, my hopes would be to create a better environment for all students regardless of race, ethnicity, and cultures to feel comfortable addressing their health status.

AN ANALYSIS OF RETROSPECTIVE VOTING IN MICHIGAN SCHOOL BOARD ELECTIONS
Nicholas Vogt, Brian Swets
Category: Social Science: General, Section 1
Location: MSU Room
Time: 10:00 AM-10:15 AM
Mentor(s): Michael Conlin (Economics)

School board elections represent an ideal context for evaluating retrospective voting—the proposition that voters hold incumbents electorally accountable for past performance—within local elections. First, they are non-partisan, so the candidate's own qualifications serve as the only signals that the voter receives. Second, the local community—particularly home-owners and not necessarily just parents—are sensitive to the reputation of their school district because school quality is an important driver of property values. Indeed, a number of studies have established a causal link between school property and student achievement (e.g., Black, 1999; Kane, Riegg, & Staiger, 2006). The proposition that voters take an interest in school board elections because school quality is so impactful on the value of their homes is called the home-voter hypothesis (Fischel, 2001; Fischel, 2009), which has empirical support. For example, Oliver & Ha (2007) tests the home-vote hypothesis in a suburban setting and finds that homeowners are significantly more likely to have an interest in and be informed of local candidates and aware of the major issues. This paper assumes that the home-voter hypothesis is valid and therefore seeks to test whether retrospective voting occurs. That is, do changes in school quality—as measured by changes in test scores and changes in enrollment—impact an incumbent's likelihood of winning?

BREAKING INTO THE BOYS' CLUB: A SOCIOLOGICAL STUDY EXAMINING GENDERED EXPERIENCES IN SCIENCE
Madison Fitzgerald
Category: Social Science: General, Section 1
Location: MSU Room

Time: 10:15 AM-10:30 AM
Mentor(s): Nancy DeJoy (Writing, Rhetoric, and American Cultures)

The purpose of this ongoing study is to understand gendered experiences in science for women, using the Michigan State University Department of Physics and Astronomy to gather data. It, first, defines "equality", second, evaluates the data, and third, comes to a conclusion on how "equal" science is for women. The critical questions examined in this study are: 1) Do women experience science differently than men?; 2) If so, how, and how does this affect science itself?; and 3) If these gendered divisions do not exist, what could this mean for the future of equality in society as a whole? The project confronts repressive gender-based policies and habits of mind in science to understand gendered power dynamics in science itself and the scientific workplace, the socialization of science and math as masculine, social inequality of men and women, and the glass ceiling.

ORAL PRESENTATIONS, SECTION 2
MSU ROOM, 1:00-2:45 PM

BETTER TOGETHER?: THE STATUS OF INTEGRATION IN THE MILITARY
Kristiane Schmidt
Category: Social Science: General, Section 2
Location: MSU Room
Time: 1:00 PM-1:15 PM
Mentor(s): Allison Berg (James Madison College)

For decades, scholars have viewed the military as a progressive institution due to its ability to adapt to social change. In civilian society, public opinion reflects the assumption of a colorblind world in which discrimination is dead. Those who assume this mentality would suggest that the armed forces surpassed racial discrimination with the adoption of Executive Order 9981. While the representation of minority groups in the military has improved dramatically, racial discrimination persists in the military today. In today's "colorblind" society, the military has adopted the mentality that discrimination within the ranks is a thing of the past. This is reinforced by the fact that a large portion of racial discrimination and harassment complaints are ignored or dismissed by officers. The hierarchical structure of the military offered an opportunity to advance integration policies throughout the ranks, whether or not individuals supported the concept, allowing the institution to make strides toward racial integration that were unforeseeable for civilian society in 1948. In addition, its separate nature allowed it to operate independently of typical social backlash or employment procedures. However, this very same hierarchical structure stands in the way of achieving true racial equality within the ranks today by limiting black service members' opportunity to advance and silencing their protests against injustice. Understanding the status of racial integration in the military today will hopefully allow us to understand the obstacles standing in the way of progress in the nation as a whole.

THE GEOPOLITICAL POWER SHIFT IN EURASIA: A NEW WORLD ORDER?
Jacqueline Cicchini
Category: Social Science: General, Section 2
Location: MSU Room
Time: 1:15 PM-1:30 PM
Mentor(s): Norman Graham (James Madison College)

Eurasia serves as a case study for a new world order. Two dominating nations, Russia and China, have seen a power shift from the soviet era to modern society. China's economic rise to power has made other strong nations such as the United Nations begin to question China's power as its strong economic dominance continues to grow despite maintaining a centralized government without the framework of a democracy. China has openly expressed its interest in creating a new international framework that is different from western institutions. China's relationship with Russia has proven to be a further example of China's strategic plan to gain power within the region. Post-soviet countries such as Kazakhstan, Georgia, Azerbaijan, and Uzbekistan have experienced this geopolitical power shift economically in terms of trade, infrastructure development, tourism, and cultural influences. Russia has dominated in the region in terms of financial support and trade for post-soviet nations, especially in the sectors of energy and oil. Recently, China has been providing loans for infrastructure development to build railway, roads, hydroelectric power plants, and oil pipelines, which can be understood as a sign of power. The Chinese model of consumption, investment, and net exports of goods and services has enabled their economy of become the second highest in the world in a short-period of time. As we examine the history and developing relationship between Russia and China as well economic progresses in Eurasia, we can use this as further evidence of China's strategy for global power.

A CROSSROADS FOR ENVIRONMENTAL SOCIOLOGY: BIOPHILIA AND ECOLOGICAL-EVOLUTIONARY THEORY AS MID-RANGE THEORIES
Kevin Adams
Category: Social Science: General, Section 2
Location: MSU Room

Time: 1:30 PM-1:45 PM
Mentor(s): Sandra Marquart-Pyatt (Sociology)

Environmental sociology, in the years since its inception, has filled a much needed gap in sociology, addressing the interactions between and intertwining of the natural and social worlds. This aim, however, has been hindered by the pervasive difficulty in developing theory that is not only sound on the most grandiose of scales, but also holds value in highly contextualized situations and may be translated and applied across time and space. This paper explores two mid-range theory candidates – The Biophilia Hypothesis and Ecological-Evolutionary Theory – evaluating their usefulness in environmental sociology. This exploration is two-fold: first, an in-depth analysis of each theory will be provided, discussing its merits and shortcomings, and second, each theory will be applied to the same case study (sustainable urban space design in London, UK and East Lansing, MI) to understand the theory's potential for contextual application. Upon completion of this text, it is our hope that environmental sociology will find itself in a position to better apply these theories for the production of knowledge moving forward.

POLITICAL DISCOURSE AND IMMIGRATION: STUDYING IMMIGRATION THROUGH THE LENS OF GENOCIDE
Tara Schulz
Category: Social Science: General, Section 2
Location: MSU Room
Time: 1:45 PM-2:00 PM
Mentor(s): Christina DeJong (Criminal Justice)

In 2010, legislators in Arizona introduced the "Support Our Law Enforcement and Safe Neighborhoods Act" (Arizona SB 1070), which empowered police officers and government officials to stop individuals suspected of immigrating illegally into the United States and request proof of citizenship. As private discourse over this act commenced in the Senate Chamber of the Arizona State House, public discourse over this act exploded. The language used by politicians to present and debate the issue in the public sector was thought by some to be driven by anti-Latino racism, especially towards Mexicans and people of Mexican descent living in Arizona. Political discourse on Arizona SB 1070 quickly shifted from a technical debate of a political immigration policy towards an illogical public system of attribution, linking the presence of illegal drugs in Arizona and increasing crime rates to Mexican immigrants present in the state. The discourse used in these public debates mirrors language used during the early stages of genocide, in which a minority group is typically defined as the "other" and blamed (i.e. scapegoated) for the problems and ills of society. In this paper, we attempt to explain the public discourse of politicians surrounding Arizona SB 1070 using a framework developed to study genocide. Our hypotheses will test whether this "pre-genocidal" language exists in political discourse, the frequency at which it exists, and whether there are differences in the use of pre-genocidal language based on politicians' age, gender, race/ethnicity, political party, and region of country.

WOMEN IN PROBATION & PAROLE
Anita Western
Category: Social Science: General, Section 2
Location: MSU Room
Time: 2:00 PM-2:15 PM
Mentor(s): Jennifer Cobbina (Criminal Justice)

For women, the prison environment emphasizes a victim role that was initiated during their childhood. The prison setting reinforces a lack of vocation role definition that has the potential of leading to emotional dependence and conflicts in communal, family, and intimate relations. Though they may not be completely prepared, when the women are released from prison they are forced to adjust to community living. Finding sustained employment, stable housing and reconnecting with their families are important mechanisms of their transition from incarceration to society.
My research explores the lives of drug-involved female felons who have a high risk of recidivating. My focus is on the individual turning points influencing the probability of females recidivating after they are released from prison using data gathered from interviews with the women while they were on probation and at multiple times after their release. These formerly incarcerated women depict the strengths they used to cope with their reentry after release from incarceration. In-depth face-to-face interviews with the women examined their life courses from the beginning of their earliest memories. The project's goal is to uncover the personal and societal transitions that contributed to their positive decisions. I believe that maturation is an imperative factor in their transition experiences along with the concern for their children, fear of physical harm and the risk of criminal deviance. As a group, the women emphasized that a combination of individual dependence, interpersonal capacities, and societal programs, policies and services facilitated their successful transition from prison to society.

DETERRENCE IN ILLICIT ELECTRONIC WASTE DISPOSAL
Austin Flowers
Category: Social Science: General, Section 2
Location: MSU Room
Time: 2:15 PM-2:30 PM
Mentor(s): Mark Axelrod (James Madison College)

The issue the project investigates is the illegal aspect of electronic waste disposal in forms of imports, exports, and dumping

around the world. Solving the issue requires a look into the new legislation that is being implemented in many countries around the world since the beginning of the 21st Century. The project focuses on trying to discern a measurable deterrence of "e-waste" legislation of countries in the European Union and the United States. The legislation's deterrence power is compared through the cases of punishment published within newspapers around the world to understand how each country deals with the measurable cases of illicit activity being caught. In the presentation, the legislation and comparison of the case studies will be presented to show how illegal activity is handled worldwide. Overall, it will display how different countries try to dissuade the rising issue of illegally imported, exported, and dumped e-waste, how effective that is, and how the legal systems try to address a new issue upcoming in the international system.

MICHIGAN STATE UNIVERSITY'S UNDERGRADUATE DRINKING CULTURE
Teresa Bitner
Category: Social Science: General, Section 2
Location: MSU Room
Time: 2:30 PM-2:45 PM
Mentor(s): Julia Grant (James Madison College)

This study assesses the undergraduate student drinking culture at Michigan State University (MSU) as well as the policies and practices intended to influence a healthy environment. According to previous research, the reported blood alcohol content (BAC) for undergraduate students at MSU is slightly lower than the nation's reported average. The report at MSU, however, also revealed undergraduates' unhealthy alcohol consumption habits, such as binge drinking. Currently at MSU, there exist legal remedies and social norming campaigns to control the student drinking culture. This research is intended to examine both the positive and negative effects of these existing controls, while additionally considering the best practices implemented at similar institutions. Concluding, this study provides MSU with recommended methods for alcohol control and education intended to assist in reducing the rates of undergraduate students drinking excessively. With the final propositions from this research, together the university, community, and students will need to collaborate on how to most effectively shift policy and practices to create a healthier undergraduate student drinking culture.

POSTER PRESENTATIONS, SECTION 1
SECOND FLOOR CONCOURSE, 9:00-11:00 AM

SELF IDENTIFICATION OF AFRICAN AMERICAN YOUTH
Alexandria Vaughn-Powe
Category: Social Science: General, Section 1
Poster: 513
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Tamara Butler (African American and African Studies)

African American and African studies has become a strong interest during my undergraduate career because youth are our future intellectuals. The topic of youth self identification has drawn close to me over time what drives these perceptions and views within themselves as well as others around them. I currently work for a youth assistant program in a low income housing community where I tutor children ages 5-18 in different subjects as well as help them develop characteristics important for growth and maturity. Being active in opportunities such as these have allowed me to witness what goes on in the environment amongst youth and how they identify and view one another. I want to research what racial ideas and stereotypes are being talked about outside as well as within the youth community and ultimately create solutions that can be adopted in communities for youth to have a safe space to talk about race and what ways they can overcome these stereotypical racial perceptions. Within my research I would like to interview a sample of high school students to get an understanding of what types of conversations are being had and get ideas from the students themselves of what types of changes they would like to see within their communities to change these perceptions.

THE FACILITATION APP PROJECT: ANATOMY OF A MACHINE LEARNING PROJECT IN TECHNICAL COMMUNICATION
Ian Clark
Category: Social Science: General, Section 1
Poster: 514
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Bill Hart-Davidson (College of Arts and Letters)

In this presentation, we will present the results of a project to investigate and develop facilitation practices for informal learning in STEM areas. Working with partners at a science center in the Southeastern, our team developed and tested a "facilitation toolkit" for museum staff charged with leading online activities and discussions to foster public engagement and learning about science. We subsequently developed an interactive version of the toolkit- a web-based application that performs rhetorical analysis and visualizes results on the fly - as an assistive resource for training facilitators and aiding decision-making during

facilitation sessions. We believe that our facilitation application can allow for broad public engagement - including open commenting - while providing facilitators with the help they need to ensure that they are guiding discussion toward productive ends. Speakers will discuss the coding process in two ways: 1) the use of our coding tool for the facilitation app and 2) coding in regard to the design process and building the application itself. To do this, we will demonstrate the application itself and explain the design decisions behind each of the data visualizations in light of the work of museum staff.

"I KNOW THAT I'M DOING IT, AND I DON'T THINK ANYONE'S TOLD ME TO DO THAT": PARENT'S AWARENESS AND RECEIPT OF INFORMATION ABOUT PROMOTING THE LANGUAGE DEVELOPMENT OF THEIR CHILD WITH HEARING LOSS
Rebecca Barron, Allison Bunch, Ariel Graham, Tierra Whitfield
Category: Social Science: General, Section 1
Poster: 515
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Due to the language delays that many children with hearing loss (HL) experience, early intervention should include providing parents with information about ways to promote their child's language skills (Moeller et al., 2013). Research suggests that parents' use of specific language techniques are shown to promote the language development of children with HL (Cruz et al., 2013). However, little is known about parents' awareness of their use of these language techniques, or whether or not they have received information about them. Therefore, we ask: 1) Are parents aware of their use of different language techniques when interacting with their children who have HL? 2) Do parents report that they have received information about these techniques? Participants included 12 parents (11 mothers) who were hearing, and their children with permanent hearing loss who were between 12-29 months of age (M= 21.6). After parents played with their children, the interviewer gave parents examples of language techniques they had used, and asked (a) if they were aware that they used this technique, and (b) if they had received information about this technique. All parents were aware of their use of techniques that are not shown to promote children's language development, regardless of whether or not they had received information about these techniques. Of the techniques that are shown to be important for children's language skills, there is a great deal of variability in parents' reports of awareness and receipt of information.

PHILOSOPHY OF SPORT: A THEORY OF JUSTICE AND THE INSTITUTIONALIZED POWER OF THE UNIVERSITY OF DAYTON, THE NCAA, AND THE NBA
D'Antae Gooden
Category: Social Science: General, Section 1
Poster: 516
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): John McClendon (Philosophy)

Due to the growing nature and power, or exercise thereof, of athletic institutions such the NCAA and the NBA it has become crucial to understand how the exercises of power affect individual athletes. In philosophy of sport it is important to understand philosophical problems that are inherent in the relationship between athletes and these athletic institutions. In my research I made an assessment of institutionalized power in terms of these three organizations and conceptualized a theory of justice. Simply put, my assessment is looking to examine how these institutions exercise power over athletes, in ways that are outside of common notions of justice. I conducted my research using a case study of two athletes, Roger Brown and Connie Hawkins. I examined documents relating to the cases of Roger Brown and Connie Hawkins, who were victims of unjust institutionalized power of the NBA, and through these cases I looked to show how the power of these institutions could trump justice. I will present, in detail, these cases and the relevant documents to show the philosophical problems that can come about as a result of the relationship between athletes and athletic institutions.

THE IMPORTANCE OF PARENT'S NONVERBAL COMMUNICATION TO SUPPORT CHILD LANGUAGE DEVELOPMENT
Simone Alhagri, Rachel Nelson
Category: Social Science: General, Section 1
Poster: 517
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Previous research states that nonverbal aspects of communication – such as gestures, facial expressions, and tone of voice – are important influences on child language development, in addition to oral language (Grebelsky-Lichtman, 2014). Our project seeks to identify how the quality of nonverbal communication between parents can directly affect a child's early language growth. This study is important because there is a current emphasis on teaching parents to talk to children more, but less emphasis is being placed on other aspects of communication. We hypothesize that parents who show higher quality nonverbal cues and responses to children's nonverbal cues are more likely to have children with advanced language skills. Participants include 40 parent-child dyads, with the children from 10 to 14 months old. Parents and children were videotaped while playing

together with toys that the researchers provided; this was done in the child's home or childcare center. Videos were later coded (using the rating system) to determine the quality of the verbal and nonverbal aspects of the overall interaction. Children's receptive and expressive language skills were assessed by the research team using the Bayley Scales of Infant Development Exam. We will use correlations to assess the relationships between the quality of nonverbal aspects of parents' communication and the children's outcomes of the Bayley language exam.

NEGOTIATING POLITICAL IDENTITY IN A TRANSNATIONAL CONTEXT
Chik Yi Lau
Category: Social Science: General, Section 1
Poster: 518
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Xiqiao Wang (Writing, Rhetoric and American Cultures)

This presentation reports findings from a year-long ethnographic study of one international student's digital literacy practices. Taking a connective ethnographic approach (Leander and Boldt, 2007), we collected data (interviews, screenshots of student's online activities, field notes during major campus events and trips) to trace the complexity of one student's effort to negotiate her political identity in a transnational context. Findings suggest that such efforts are mediated through social networking technologies and are marked by conflicting censorship policies, contentious political-economic circumstances, and multiple identity possibilities.

EXPLORING THE THIRD CULTURE: RESOURCES, RESEARCH, AND UNDERSTANDING
Alexandra Gandy
Category: Social Science: General, Section 1
Poster: 519
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Cheryl Caesar (Writing, Rhetoric and American Cultures)

Many universities docus heavily on blending different cultures by assimilating international students into the home culture and allowing domestic students the chance to experience cultural differences. However, a group of students is left out. Third culture people are those who were born into one culture, have spent much of their developmental years in another culture, and then return to the culture they were born in. At university, they are often left feeling conflicted as to which culture they feel a part of, which distances them from others as they struggle to understand their culture shock. My poster presentation will utilize student interviews, online resources, and academic research to propose better methods of inclusiveness to students from a wider range of cultural backgrounds. My presentation will allow for greater understanding of the way culture interact with individuals, and provide better informational resources for students struggling with culture shock.

HOUSING ABANDONMENT AND ACCESS TO AMENITIES
Kelly Christopherson
Category: Social Science: General, Section 1
Poster: 520
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Rex LaMore (Planning, Design and Construction), Madan Syal (Planning, Design and Construction)

Building vacancy and property abandonment are central components of the widespread blight that plagues many of America's historic manufacturing cities. Declining population leads to a pattern of abandonment and demolition/deconstruction of private, mixed-use and industrial property, which in turn contributes to the ever-declining population in former urban centers. In many neighborhoods, formerly fully populated city blocks now only have one or two structures. These areas of lower population density within urban centers are then under-served by publicly provided amenities such as bus services, and have decreased access to necessary resources such as food. Understanding how residents of these city neighborhoods are affected by the changing demographics in their neighborhood is requisite for the construction of effective public policy to address the challenges presented in these situations. Using data provided by the Detroit Department of Transportation, and the non-profit firm Data Driven Detroit, I examined two census tracts within the city limits of Detroit, Michigan to compare the differences in population density and access to neighborhood amenities. Future work should seek to determine a causal or preventative link between neighborhood amenities and housing density. This information should then be used to develop recommendations for the improvement and support of Detroit's blighted neighborhoods.

POSTER PRESENTATIONS, SECTION 2
SECOND FLOOR CONCOURSE, 9:00-11:00 AM

THE WRITTEN OPINIONS OF THE UK SUPREME COURT
Hailey Lobb, Sean Weston
Category: Social Science: General, Section 2
Poster: 523
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Ryan Black (Political Science)

In early October 2009, two Supreme Courts went to work. One, the U.S. Supreme Court, had been a prominent player in domestic politics for nearly one hundred years. Another, the U.K. Supreme Court, was opening its doors for the very first time and only taking its first tentative steps outside of the shadow of Parliament, which enjoys considerably more power than the U.S. Congress. Since 2009, the U.K. Supreme Court has issued over 300 written opinions in a host of important matters ranging from gay rights to terrorism. In this poster we present some preliminary data on the new Court's written opinions. We also provide contrasts between the new Court's opinions and those written when the highest judicial body was formally part of Parliament.

EARLY GENDER DIFFERENCES IN EMOTION SOCIALIZATION?
Ustina Shives
Category: Social Science: General, Section 2
Poster: 524
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Previous research indicates that early emotion skills in infants are socialized in home and school settings (Cassidy et. al., 1992), and girls may be socialized earlier than boys. For example, in early childhood, girls have more emotional intensity than boys (Ahn & Stiffer, 2010; Casey, 1993). However, most studies focus on school age children, whereas, I ask whether this socialization, and gender differences therein, begin in infancy. That is, is there a correlation between infants' and their parents' intensities of emotional expression? Does this vary by infant gender? Two different tasks are used to assess the intensities of parents' and infants' emotional expression; both tasks were videotaped then coded using the same coding systems. To measure parents' emotion intensity we told them six stories designed to elicit certain emotions, and asked them to express those emotions; we later coded for their intensities of emotional expressions. To measure the infants' emotion intensity, we gave the children four challenging tasks which we videotaped and coded specifically for the intensities of their frustration and pleasure emotions. The Pearson's correlation test will used to identify the strength of the association between the two continuous variables representing parents' and infants' intensities of expression. Then we will separate the sample based on child gender, and repeat the correlations to determine whether there is a stronger association for girls than for boys. Examining the relationship between parents' and infants' emotional intensities, we can better understand how emotional expressions are socialized from one generation to the next.

EFFECTS OF NEONATAL HEALTH AND BREASTFEEDING ON CHILD LANGUAGE DEVELOPMENT
Jacqueline Evans, Sahithi Chinnam, Kaitlin Morain
Category: Social Science: General, Section 2
Poster: 525
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Most expecting parents are informed of the effects neonatal health has on children's physical well-being, yet many may not know the specific impact of neonatal health, including gestational age, birth weight, and breastfeeding, on development of child language skills. Vohr (1988) showed that language skills are delayed in a substantial percentage of low birth weight infants tested at eight months and two years. However, this and other studies included only infants who had low birth weight for gestational age, rather than looking at variation within a typical community sample. The question of early health factors' effects on development of language skills is important because it provides insight into initial development of social and communicative skills in young children, which can further make an impact on their mental health, academic achievement, and social interactions. Therefore, we will use data from a community sample to test whether neonatal health predicts rate of language development throughout toddlerhood, and expect to find a linear correlation between these factors. We are testing whether early health affects development of expressive and receptive language skills. Using the Bayley Scales of Infant Development, we assess change in the expressive and receptive language scores of 40 children between 12 and 30 months, and examine associations between their scores and three neonatal health indicators: birth weight, gestational age, and breastfeeding duration. We will control for educational level of primary caregivers and household income, which may have a significant impacts on early language development.

TERRITORIAL RESOURCES AND FISHERIES: INDIA AND SRI LANKA'S EVOLVING RELATIONSHIP
Houston Smith

Category: Social Science: General, Section 2
Poster: 526
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Mark Axelrod (James Madison College)

The Palk Strait has recently been the site of tension, creating a case study of international conflict resolution. Both India and Sri Lanka depend heavily on the Palk fisheries, and despite the establishment of the International Maritime Boundary Line (IMBL), they have experienced issues with trawlers from both nations fishing on the wrong side. This has lead to an aggressive streak of fishermen being arrested. Fishermen from one country are periodically arrested by the other under the pretense of punishment for poaching and then later released in the name of diplomacy. My research focuses on the interactions between two sovereign nations with competing resources and how these tensions are dealt with on a political level. To accomplish this, I cataloged every single news article over the time period covering this topic from The Hindu, an Indian news website. With this information, I compiled the number of arrests and releases from both countries. To understand the complexity of this relationship, it is important to study the political climates of both of the countries involved. While leadership changes in India did not result in a reduction of conflict, a new prime minister in Sri Lanka led to almost immediate progress towards a mutual understanding between the nations. Looking at trends in the amount of arrests and comparing these to political changes going on within the different governments will offer insight into conflict resolution, especially when it deals with the problem of limited resources.

SEX MODERATES THE RELATIONSHIP BETWEEN AGREEABLENESS, BUT NOT OTHER PERSONALITY TRAITS, AND THE PERCEPTION OF INFORMAL SOCIAL CONTROL
Janine Mator, Ashlyn Lowe, Isabel Silverstein
Category: Social Science: General, Section 2
Poster: 527
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Sybil Burt (Psychology)

The bystander effect occurs when an isolated individual does not intervene during a crisis due to the belief that someone else will. Informal social control is a similar concept that assesses one's willingness to undertake activities that maintain social order. While the bystander effect has been heavily investigated, very little research has examined which factors contribute to an individual's perception of informal social control. In particular, it has not yet been investigated whether an individual's personality traits predicts his or her expectation that neighbors will intervene in situations related to child welfare, delinquency, crime, or safety, and if these relationships are moderated by the individual's sex. In this study, a community-based sample of adults living in disadvantaged neighborhoods across the state of Michigan (N=1729) completed the Miniature International Personality Item Pool and the Neighborhood Matters Informal Social Control questionnaire. In particular, we hypothesized that the personality trait of agreeableness will be uniquely related to behaviors that perpetuate informal social control due to its association with empathy and responsiveness to others. Our results will lead to a better understanding how different individuals perceive informal social control in their neighborhoods and will spur further research in the field of neighborhood matters and community characteristics.

TRANSGENDER JOB APPLICATIONS AND ASSOCIATED STEREOTYPES
Dan Grenzicki
Category: Social Science: General, Section 2
Poster: 528
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM
Mentor(s): Emily Pacic (Psychology), Ann Ryan (Psychology)

This study will examine how individuals react to Transgendered job seekers. We hope to discover the specific challenges associated with acknowledging or hiding an identity which can be invisible or visible, as can be the case with a transgender identity. We provided participants with a profile of an individual who was in some phase of transitioning from male to female or female to male, with the same resume for all profiles. We then asked individuals to evaluate the candidate. We also examined the stereotypes associated with transgender individuals in the context of the workplace. This research is important because it will provide information on how Transgender individuals can effectively manage their non conforming gender identity, potentially helping them in finding and and retaining employment.

RELATIONS BETWEEN FAMILY CLIMATE AND MOTHERS' AND FATHERS' NEGATIVE RESPONSES TO TODDLERS' EMOTIONS
Danielle Zeolla
Category: Social Science: General, Section 2
Poster: 529
Location: Second Floor Concourse
Time: 9:00 AM-11:00 AM

Mentor(s): Holly Brophy-Herb (Human Development and Family Studies)

The family climate may be related to how parents respond to their toddlers' negative emotions, a key aspect of emotion socialization. Few studies have examined how family climate characteristics are related to both mothers' and fathers' responses to toddlers' emotions. Sixty-four mothers and fathers of toddlers (M_{age} = 28.9 mos., *SD* = 3.93) were interviewed separately on their beliefs about emotions and emotional expressivity in the home. The study hypothesized that parents' negative beliefs about emotions and the degree of negative expressivity at home would relate to parents' unsupportive responses to toddlers' negative emotions. Emotion beliefs refer to parents' attitudes about the value and expression of emotions, such as anger and sadness. Negative expressivity in the home refers to the frequency of expressions of negative affect in the home, such as expressions of anger. Separate linear regression models were employed to examine family climate characteristics associated with mothers' and fathers' unsupportive responses to toddlers' emotions. Results revealed that, for fathers, both negative emotion beliefs, β = .466, p = .000, and negative expressivity in the home, β= .260, p = .048, were related to fathers' unsupportive responses. For mothers, only negative emotion beliefs, β= .506, p = .000, were related to their unsupportive responses. Results suggest that fathers may be more sensitive to the overall family climate in how they respond to their toddlers' emotions. Subsequent research should examine multiple dimensions of the family climate, and differential relations between these family processes and mothers' and fathers' emotion socialization practices.

POSTER PRESENTATIONS, SECTION 3
LAKE HURON ROOM, 1:00-3:00 PM

SEEKING IDENTITY: NEW WAVE OF AFRICANS IN THE DIASPORA
Waithera Chege
Category: Social Science: General, Section 3
Poster: 533
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Tamara Butler (African and African American Studies)

This research project will explore the ways in which the most recent wave of Africans in the Diaspora identify themselves. I will analyze the experiences of those born in different countries in the continent Africa (or birthed from parents whom are or were citizens of an African country) but have now spent a significant amount of time in the USA.I will look at their unique experience away from the continent of Africa by exploring the languages they speak and claim as their own, citizenship they hold, and how these tie into their proclaimed identity. I will also explore the intersection of their ethnic-racial identities. Posing questions such as: Do they identify more with those of their ethnic or racial background in America? Do they feel American enough? Do they feel African enough? Where do they lie in the American black struggle? Other questions that guide this research include, but are not limited to: Where is home? Do they plan on returning to their respective African countries in the future? Through interviews and surveys of these individuals, an analysis of their responses will be done and presented. Exploration of literature related to Afropolitanism will be used in this research.

CHINESE STUDENT RENMAI (??): THE UNDERGROUND ECONOMY ON THE MSU CAMPUS
Tunan Guo, Yisi Fan
Category: Social Science: General, Section 3
Poster: 534
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Steven Fraiberg (Writing, Rhetoric, and American Cultures)

At Michigan State University, there has been a dramatic increase in the Chinese student international population over the past five years, increasing from 4% of the student population in 2007 to nearly 12% of the student population in the 2014 academic year. These shifts have led to a rapid transformation in the linguistic, social, and physical landscape in and across campus and the wider East Lansing community. Evidence of these changes are apparent in the wide array of businesses across campus and the main city street on Grand River Avenue. These include an assortment of markets, restaurants, bookstores, car dealers, karaoke bars, online stores, import and export enterprises, tutoring services, and delivery services. In this longitudinal study, we are adopting an ethnographic and mixed-approach to more closely examine these businesses in effort to understand the wider motivations, processes, and practices mediating these student-run businesses and organizations. In particular the study maps out the ways that renmai (interpersonal connections)--a cultural practice central to business relationships and social transactions in Chinese society--mediated the construction of communities, relationships, and affiliations as the students developed their businesses on and off campus. This presentation will ground its analysis in survey and interview data as well as through a fine grained case study of a Chinese illustrating the core themes and issues.

FEEDING THE FUTURE
Madeline Judge, Maria Cotter, Leah Desposato
Category: Social Science: General, Section 3
Poster: 535

Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Matt Raven (Community Sustainability), Laurie Thorp (Residential Initiative on the Study of the Environment)

"As a consumable, shareable, and concrete cultural material, food is an essential component of the building and preservation of communities and group identities"(Purnell, 2013). A residential program that fosters a strong sense of community among its members helps make a large university less intimidating and gives students a sense of belonging on campus. The Feeding the Future research grant was designed to measure the change in students' knowledge, attitude, and self-reported sense of community through their involvement in educational, hands-on activities with a focus on sustainable food systems. This is measured through student involvement in the Bailey GREENhouse, edible landscape, green roof, cooking workshops, and organized activities. Their purpose is to highlight questions like "Where does our food come from?" and teach students about incorporating sustainable choices in their everyday lives. During the 2014-2015 academic year, the focus is to measure students' sense of community and understanding of sustainable food systems. As a second part of this research project, the investigators are developing a universal tool to measure how people value their food beyond its monetary worth. The cultural, personal and intangible relationships people have with their food has not been fully studied, and the investigators are working to create a set of questions and scenarios that highlight the inherent value of food beyond its price tag. Overall, we hope to find that engaging in communities and food systems can play a role in student's sense of belonging, and in turn increase student success at Michigan State University.

RESIDENTIAL PRIVATE PROPERTY ABANDONMENT
Hafsa Khan
Category: Social Science: General, Section 3
Poster: 536
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Rex LaMore (Outreach and Engagement Partnerships), Madan Syal (Planning, Design, and Construction)

Residential private property abandonment is a growing problem in major cities in Michigan and across the United States, such as Detroit, Flint, Ann Arbor, Lansing, and Baltimore. Abandonment in one area leads to decreasing property values in surrounding neighborhoods and encourages blight in nearby areas. This viral spreading of abandonment creates negative impacts for the residents in the area and the local and state governments.Direct implications for the residents in the area include decreasing quality of schools and municipal services, such as recreational centers, increase in gang activity, violence, and graffiti, and decreased investment in the area. Blighted areas also pose a dangerous and exponentially growing problem to city governments. Once land is abandoned, the house deteriorates and becomes unsuitable for residence and is unlikely to be sold. In cities like Detroit, this has caused housing shortages; debts left by unpaid property taxes and cost for deconstructing abandoned structures are forced onto the municipal government.The purpose of this research is to find an efficient and effective way to limit the spread of blight and address areas where blight already exists. Residence of a neighborhood and local and state government can play a major role in limiting spread and addressing abandoned areas. For example, the City of Detroit has one of the largest problems with blight. The city has set aside funds specifically to demolish abandoned building and recycle materials. In addition, the city is re-structuring policies concerning property taxes, fire insurance, auctions of abandoned property, and scrap metal commerce.

MASS SHOOTINGS IN THE MEDIA: WHAT MAKES A STORY NEWSWORTHY?
Madeline MacLean, Andrew Martin
Category: Social Science: General, Section 3
Poster: 537
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): April Zeoli (Criminal Justice)

From January 2009 through September 2014, 112 mass shootings (defined as a shooting that results in four or more deaths) occurred in the United States, yet only a handful have made it into the public discourse. In this research, we propose that one reason many of these mass shootings are not well known is because they have not received national news coverage. We attempt to uncover the factors that make some mass shootings worthy of national television news coverage whereas most—64 shootings, or 57% of the cases we researched—have no stories to their name at all. Using a search of broadcast transcripts discussing the crime, its perpetrator, and the victims, we compiled the number of reports on national television news shows that each mass shooting received and the average number of words spent conversing about mass shootings from Newtown, Connecticut, to Newton Falls, Ohio. Possible factors into the extent to which the shooting is reported include mental health, who was targeted, where the shooting took place, how many people were killed or injured, whether or not the shooter acquired the firearm legally, race of the shooter, and interesting or shocking details of the shooting. We investigate the extent to which the mass shootings considered newsworthy are representative of all mass shootings, as the media presentation of only some mass shootings as newsworthy may result in the American public having a skewed view of the problem of mass shootings in society.

ENDING PRIVATE PROPERTY ABANDONMENT AND BLIGHT

Andrew Netter
Category: Social Science: General, Section 3
Poster: 538
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Rex Lamore (Outreach and Engagement Partnerships), Matt G Syal (Planning, Design and Construction)

Vacant structures/buildings have increasingly become a major issue for cities all around the United States as well as around the world. Countries around the world faced with this issue have, in growing numbers, turned to the sustainable option of deconstruction to get rid of such blighted properties. The option of deconstruction allows for the reuse or recycling of building materials, reduction of wastes sent to landfill (which is crucial in a country with limited land space), and also cuts down on energy consumption that is put into the production of new building materials. The U.S. however, largely relies on the process of demolition to remove blighted structures from abandoned property. This choice to utilize the practice of demolition however sends 125 million tons of construction/demolition waste to landfills throughout the U.S (Dantata, N., Touran, A., & Wang, J. (2005)). The U.S. needs to push policy that advocates the practices of deconstruction as a way to address the issues of vacant land and blighted structures and also to reduce the amount of waste sent to landfills through the reuse and recycling of building materials.

THE CORRELATION BETWEEN RELIGION AND MORALITY
Kathryn Bailey, Cassidy Hines
Category: Social Science: General, Section 3
Poster: 539
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Peter White (Entomology)

The Creation Museum in Petersburg, Kentucky makes many claims promoting their religious views. One of these claims is that “scripture abandoned in the culture leads to relative morality, hopelessness and meaninglessness”. Based on this claim, the correlation between general morality and religious affiliation was analyzed. Data was quantified into these two groups to form two testable variable groups: morality as measured by criminal activity, and religiousness as measured by religious affiliation by region. By conducting a quantitative analysis of religiousness and criminal activity throughout various regions within the United States as well as nations outside of the United States, the complex nature of morality was revealed. It is important to discover whether there is a correlation between morality and religious affiliation; for example if a positive correlation between these two variables is found, then it may be assumed that if religious attendance continues to decline in the coming years there may also be significant rises in criminal activity. Furthermore, it has been predicted by several faith leaders that certain decreases in religious studies lead to destructive behavior, which includes but is not limited to: higher crime rates, rates of abortions, incidences of murder, pornography distribution, and premarital sex. This presentation will cover the overall findings of this research. There has been research conducted previously that supports both sides of this issue, and with further research it may be possible to better understand the conclusive causes for both moral and immoral behavior.

DIFFERENCES IN TEACHERS’ AND PARENTS’ TEACHING-RELATED BEHAVIORS IN INTERACTIONS WITH TODDLERS
Samantha Pastoria
Category: Social Science: General, Section 3
Poster: 540
Location: Lake Huron Room
Time: 1:00 PM-3:00 PM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

More than 50% of U.S. infants and toddlers spend >20 hours/week in early care and education environments, thus qualifications of early educators is increasingly important. Research on child-caregiver interactions indicates that"…positive caregiving was significantly related to caregivers' education" (NICHD, 2000). One study of adult-child interactions found that "38% of play stimulation variability was explained by [teachers'] qualification level alone" (Degotardi, 2010). Many studies evaluate the quality of child-caregiver interactions with rating scales which include broad domains such as "sensitive responsiveness" and "respect for autonomy," (Helmerhorst et al., 2014), but few examine the quality of teaching-related behaviors and cognitive stimulation for very young children. By examining the sensitivity of adult-child interactions, this study aims to determine how high quality interactions with children differ among parents and teachers. Additionally, this study will examine the effects of a caregiver's education on these interactions. Participants in this study were observed completing two play tasks in a home or school setting. Thirty children, 28 to 32 months old, were observed in play and storytelling tasks with a parent, and with a caregiver. The play task was analyzed for instances of child-initiated and child-led play. The storytelling task was coded for instances of causal and factual talk. We hypothesize that teacher-child interactions will demonstrate higher levels of these teaching-related behaviors compared to parent-child interactions. Furthermore, we hypothesize that higher levels of education in child development will correlate to more frequent instances of causal and factual talk, and child-led play.

POSTER PRESENTATIONS, SECTION 1
ENGAGEMENT CENTER, 9:00-11:00 AM

PARENT-YOUNG CHILD PROGRAM
Amy Schaafsma
Category: Social Work, Section 1
Poster: 543
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Jennifer Farley (Social Work)

The Parent-Young Child Program (PYC) provides at-home mental health services to families with young children that have experienced periods of stress, trauma, problematic child behaviors, violence, and financial strains. Services include and are not limited to emotional support and empathy, play therapy, and parent skill-building. The focus of our research has been concentrated on the impact of play therapy on the children and families. Our research looks into parent involvement, clinician-caregiver relationships, methods of play therapy, and treatment outcomes for both the child and caregiver.

SOCIAL WORKER ATTITUDES TOWARD PEOPLE WITH HIV/AIDS: NATIONAL SURVEY
Alec DeNuccio, Kailey Hindes
Category: Social Work, Section 1
Poster: 544
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Anne Hughes (Social Work)

This was a cross-sectional study that sought to describe social worker attitudes towards caring for people with HIV/AIDS, as well as the personal, professional, and educational factors that contributed to those attitudes. Using a online survey instrument, we collected quantitative data from a national random sample of licensed clinical social workers. We examined variables of interest including the participants' attitudes towards people with HIV/AIDS, general knowledge about HIV/AIDS, and attitudes towards the gay/lesbian community using several standardized measures. We were also interested in information regarding the participants' education and training as well as their personal and professional experience in relation to HIV/AIDS. These questions assessed the licensed clinical social workers' previous HIV/AIDS education, up-to-date HIV/AIDS training, and their experience in providing care for people with HIV/AIDS, their comfort level when providing care for people with HIV/AIDS, as well as their own personal HIV/AIDS evaluation.

EXAMINING THE RELATIONSHIP BETWEEN SEXUAL VICTIMIZATION, SUBSEQUENT RETALIATION AND SUICIDE RISK IN A SAMPLE OF INCARCERATED WOMEN
Carmen Hillier
Category: Social Work, Section 1
Poster: 545
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Gina Fedock (Social Work), Woo Jong Kim (Social Work), Sheryl Kubiak (Social Work)

Women in prison have a high risk of sexual victimization. A study found that 80% of women in prison reported being sexually coerced at least once during incarceration (Struckman-Johnson & Struckman-Johnson, 2006). Of these women, 11% reported having thoughts of suicide and 4% reported attempting suicide after the incident. Women in prison who have been sexually abused by prison staff also face additional threats of retaliation and challenging reporting procedures after the incident (Dirks, 2004). This project analyzed the relationship between suicide risk and severity of sexual victimization among women in prison and associations between women's suicide risk and various forms of retaliation after victimization. Based on a survey to a sample of 172 women in prison who had experienced sexual victimization during incarceration by prison staff, 23% of women reported a suicide risk factor (e.g. ideation or attempt). The results of the analysis showed that women who had experienced more severe sexual victimization had a higher rate of suicide risk. Experiencing more retaliations increased the suicide risk among women who were sexually victimized by prison staff. In particular, losing privileges and being given a misconduct ticket were significantly associated with suicide risk. These findings reflect the need for stricter policies and laws preventing sexual victimization for women in prison and more protective for those women reporting abuses. Future interventions should address suicide prevention for women who have experienced more severe victimization and multiple forms of retaliation.

PREVENTING CHILD MALTREATMENT: DO GEOGRAPHICALLY ACCESSIBLE SOCIAL SERVICES MAKE A DIFFERENCE?
Kaitlyn Kapnick

Category: Social Work, Section 1
Poster: 546
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Sacha Klein (Social Work)

Research demonstrates that child maltreatment is not evenly distributed geographically, but tends to cluster in specific neighborhoods. This suggests that investing in social services that reduce child maltreatment in these neighborhoods may be strategic, but raises a question in which services to investigate in. To inform this question, our study examines the relationship between the local availability of community services (i.e., child care, domestic violence, housing, mental health, poverty, and substance abuse services) and neighborhood rates of child maltreatment. Our study will use five years of child protective services and U.S. census data for the 2,344 census tracts that compromise mainland Los Angeles County and spatial error regression analyses to measure the relationship between service density within tracts and their surrounding areas and reported child maltreatment. Service density is measured by the number of service organizations of a given type per square mile, and child maltreatment is measured as the average number of child residents reported to child protective services for alleged maltreatment between 2009 and 2013. Moderation analyses will also be conducted to explore the interactions between housing service density and residential instability, childcare service density and child care burden (ratio of child to adult residents), and poverty services and neighborhood poverty rates. Findings will be forthcoming.

OLDER ADULTS AND TECHNOLOGY
Marianne Caddy, Hadley Brandenburg
Category: Social Work, Section 1
Poster: 547
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Paul Freddolino (Social Work)

How often do older adults utilize technology in their health care? Do they use the internet? Home care interventions? Smart phones? The topic of Older Adults and Health Care Technology is explored in our research. Based on data from the 2013/2014 pilot study Identifying Patient Training and Support Needs to Maximize Telehealth Outcomes and the updated data gathered from research completed in fall 2014 and winter 2015, we address the relationship between older adults and technology. Existing research has shown that, with proper training, older adults can utilize online health resources to improve their personal healthcare, independence, and self-reliance. Our study investigated the effectiveness of a home health care device called Cardiocom. In numerous semi-structured interviews, home health care patients were asked about their experience using Cardiocom, their use of the internet, and other potential telehealth technologies. The main purpose of the interviews was to determine what factors influence the acceptability, use, and effectiveness of technology available for improving home health care. Interview responses show great promise for the integration of technology into the home health care of older adults, and the ability of these patients to adapt to such technologies. The overall goal of the study is to determine what training and support programs are needed when it comes to improving the patient outcomes and reducing medical costs. Our presentation displays the results of our research, including common themes and the application of this information to older adults and technology use.

COMMUNITY DEVELOPMENT: A STUDY OF FAITH BASED ORGANIZATIONS WITHIN DETROIT NEIGHBORHOODS
Leonard Pennisi
Category: Social Work, Section 1
Poster: 549
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Marya Sosulski (Social Work)

Detroit's neighborhoods are vibrant hubs for asset-based community development. Asset-based community development draws on community strengths to build a better, more stable and sustainable community. The demographics are unique, rich, and useful for the recovery of Detroit. One asset that can be harnessed and studied is faith based non-profits combining with local churches within local neighborhoods in order to connect social capital through bonding of citizens and linking to local governance structure. The linkage of faith-based nonprofits and churches gives local neighborhoods direction for growth and access to community resources. Social capital flourishes within these neighborhoods. This study utilizes Census Bureau data including variables related to neighborhood assets, civic engagement, employment status, and social capital to identify relationships between religious organizations and faith based non-profits that provide employment services and recovery in Detroit. The results of this study will help to enhance the knowledge regarding Detroit's recovery and specifically, tackling issues such as civic engagement and employment status. The connection between faith-based non-profit organizations and local community churches can create a more sustainable community of neighborhoods where employment opportunities increase and resource accessibility opens up to all the citizens within the neighborhoods of Detroit.

DHS CONTINUING EDUCATION TRAININGS

Haley Hildebrand
Category: Social Work, Section 1
Poster: 550
Location: Engagement Center
Time: 9:00 AM-11:00 AM
Mentor(s): Gretchen Archer (Social Work)

MSU School of Social Work spearheaded a collaborative effort to assist the Department of Human Services (DHS) in meeting its in-service training requirements for state child welfare workers and supervisors back in 2009. The initiative was developed to promote professional competence and development, and better serve children and families. Andrews University, Eastern Michigan University, Grand Valley State University, the University of Michigan, Wayne State University, Western Michigan University, and MSU all have collaborated to offer these trainers to reach child welfare workers across the state. The main goal of my research is to assess changes in training participants since the program was piloted in 2009. Surveys are given out before and after each training that provide attendees to provide honest, anonymous feedback. I will use the information given to analyze numerous factors such as competency, average age, highest attendance rates, and new trainings that have been implemented in the past few years, specifically regarding human trafficking. By scanning surveys into the Remark database I was able to gather quantitative, as well as qualitative data and evaluate trends over time. These surveys have been very beneficial to assess competency and better gauge the audience attending these training sessions. Between September 2013-August 2014, more than 1,026 individuals participated in 44 trainings conducted in 16 cities around the state. Additionally, five trainings were available to access free of charge through online course offerings. I found these trainings provided new information on a variety of topics that child welfare workers benefited from immensely.

POSTER PRESENTATIONS, SECTION 2
2ND FLOOR CONCOURSE, 1:00-3:00 PM

DEVELOPING AND TESTING A FIDELITY INSTRUMENT FOR A SOCIAL WORK INTERVENTION PILOT PROGRAM
Olivia Ehret, Natasha Sprau
Category: Social Work, Section 2
Poster: 553
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Joanne Riebschleger (Social Work)

This presentation will cover the process used by Social Work researchers to develop and test a fidelity instrument for a pilot intervention/prevention program. The undergraduate research assistants have helped to develop this fidelity instrument, as well as put it to use while being fidelity observers for Dr. Riebschleger's YES Program. The YES Program is for children at Waverly Schools who are currently living with a family member with a mental illness. Both research assistants have attended sessions of the program and used the fidelity instrument as well as gone over fidelity data with Dr. Riebschleger. The presentation will conclude with qualitative data from other research on fidelity scales and how ours relates to other fidelity instruments in the field of social work. Our main objective is to understand and capitalize on the strengths fidelity instruments offer. We also seek to understand which aspects of fidelity instruments may not be as successful as others and how to change them to better fit a program's needs.

THE CONTINUING EDUCATION OF SOCIAL WORKERS IN THE FIELD OF CHILD WELFARE
Emily Sheridan-Fulton
Category: Social Work, Section 2
Poster: 554
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Gretchen Archer (Social Work)

There are numerous subfields within the realm of social work. One of the most populous fields is child welfare. Education in the field of social work does not end with a degree, nor does it take place solely within the confines of a classroom. There is a group of professionals dedicated to expanding the knowledge of the social work field, dedicated to passing on their knowledge through continuing education seminars in order to assist child welfare social workers in renewing their license to practice. During these seminars, participants are requested to fill out a pre-test and a post-test, which include questions about demographics and prior knowledge about the topic. In my research, I have looked at several of these seminars hosted for continuing education purposes on the topic of child abuse and concluded that these trainings improve the general knowledge about child abuse of those in attendance. During this presentation, I will show who is most likely to attend these seminars, what they learn and take away from these seminars, as well as what they would like to see in the future. Further research into child abuse must be done to understand it more fully, but these trainings provide further knowledge and insight about the topic to the attendees who in turn use their newly gained knowledge to assist abused children and their families.

LIFEBOOKS AS ADOPTION PREPARATION INTERVENTION: A COMPARATIVE LITERATURE REVIEW
Lauren Choi
Category: Social Work, Section 2
Poster: 555
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Rosemary Jackson (Social Work), Cheryl Williams-Hecksel (Social Work)

Background: In the state of Michigan, there are 13,000 children in foster care. Foster care youth have higher rates of risky behaviors, physical and mental health problems, emotional disturbances, and past trauma. Adoption out of foster care is an important way to promote stability and healing in foster care-involved youth, and interventions are needed for social work professionals to facilitate adoption processes. Purpose: The purpose of this literature review is to compare lifebooks as intervention for facilitating adoption with other adoption preparation interventions on (1) meeting Michigan adoption preparation requirements and (2) on intervention quality. Methods: This review was conducted using PRISMA criteria for systematic reviews in the PsychInfo database. Eligibility criteria included quantitative or qualitative research reports from the United States published in English between 1990 and 2015. Resulting items were evaluated on meeting Michigan adoption preparation requirements and evidence quality in terms of (1) trauma-informed care, (2) child-centered care, (3) culturally sensitive care, and (4) evidence basis. Results: The preliminary search yielded 114 articles. Preliminary results suggest that lifebooks are an effective intervention for adoption preparation in terms of meeting Michigan adoption preparation requirements and intervention quality, compared with other adoption preparation interventions (e.g., cognitive-behavioral therapy, play therapy). Conclusions: Lifebooks appear to be an effective intervention for adoption preparation. This intervention is evidence-based, trauma-informed, culturally-sensitive, and child-centered and has potential to facilitate more positive adoption experiences for children and families in the state of Michigan.

DETROIT RECOVERY STUDY
Ericka Barber
Category: Social Work, Section 2
Poster: 556
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Marya Sosulski (Social Work)

The purpose of this study was to examine the idea of recovery in regards to the city of Detroit. My study is part of a larger research project that examines Themes to be explored by our research team included topics such as microfinance, civic engagement, outside investments, repurposing infrastructure, and the impact of the arts. My individual focus looks in depth on the economic impact of the arts for the city of Detroit's during its efforts toward recovery. My research question explores questions such as what groups of the demographics of people are engaged in the arts and how the arts impact the community of Detroit in terms of economic development, civic engagement, and social cohesion. Project goals include finding how accessible the arts are to the community, factors that affect the impact on the community, as well as the economic contribution of the arts. The study utilizes data from the Census Bureau and the National Endowment of the Arts (NEA) to determine relationships between individual and neighborhood demographics, economic factors, civic engagement, and arts attendance/participation. The results of the study will contribute to understanding the various roles that different types of arts and cultural activities play in restoring neighborhoods and reconstructing Detroit as a vibrant community, that is recognized as such, and increase support for its regeneration. The value of this study is to determine what we can do to encourage arts participation and the accessibility of the arts.

EARLY SUBSTANCE USE AND TRAUMA: AN EXAMINATION OF INCARCERATED WOMEN'S HISTORIES OF SUBSTANCE USE AND CHILDHOOD TRAUMATIC EVENTS
Brittiany Compton
Category: Social Work, Section 2
Poster: 557
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Gina Fedock (Social Work), Woo Jong Kim (Social Work), Sheryl Kubiak (Social Work)

Women who have a history of multiple or cumulative childhood traumatic events have an increased risk of substance abuse concerns. Substance use is considered a common coping strategy for women with histories of childhood traumatic events (such as maltreatment or witnessing domestic violence) and this strategy also places women at risk for involvement in the criminal justice system. With a sample of women in prison, this study sought to answer the following questions: Do women who experience a larger number of childhood traumatic events start using alcohol and other drugs at an early age? Which traumatic events are significantly associated with early use of alcohol and other drugs? Among 182 incarcerated women, 108 women (59%) started to use alcohol at age 15 or before while 74 women (41%) started using alcohol after age 15. There was a significant difference in the number of childhood traumatic events between the two groups. Women who started using alcohol earlier experienced more childhood traumatic events than women who used alcohol after age 15. Women who started to use

drugs at age 15 or before experienced more childhood traumatic events than women who used drugs after age 15. These findings suggest that interventions during incarceration should target the correlation of women's childhood traumatic events to their substance use and incorporate developing different coping mechanisms that would benefit the women during incarceration and after release.

THE EFFECT OF EARLY EDUCATORS' EDUCATION AND EXPERIENCE ON CHILD LANGUAGE DEVELOPMENT
Maggie Ribick, Unzel Nadeemullah
Category: Social Work, Section 2
Poster: 558
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Prior studies have established a relationship between home environment and children's language development; for example, studies find that book sharing and the home literacy are correlated with both parent education and their children's literacy development (Van Kleeck & Vander Woude, 2003). Other studies have shown that a teacher's educational background influences how well they teach and interact with children. (Howes, Whitebook, & Phillips, 1992). However, there has been minimal research studying the effects of an educator's previous experience and educational background on child language development, particularly when accounting for parental influence. We aimed to discover how an educator's knowledge and experience with children affected their student's language development in toddlerhood. The Bayley Scales of Infant Development was used to examine the language development of 40 different children when they were 12 months and 30 months. In addition, each child's educator completed a survey on their professional experience and educational background. We hypothesize that an educator's higher level of education in child development and more years of experience will be related to greater change (from 12 to 30 months) in a child's scores on both the receptive and expressive scales on the Bayley Exam. We will use correlations to examine the relationship between change in children's Bayley exam raw scores, and educators' education and experience, controlling for parents' educational levels and family income.

EFFECTS OF PARENTING PRACTICES ON CHINESE CHILDREN'S MENTAL HEALTH
Xi Zhang
Category: Social Work, Section 2
Poster: 559
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Kyunghee Lee (Social Work)

The purpose of this study is to investigate the relationship between various parenting practices and children's mental health among Chinese families. Questions were addressed: (1) do parental baseline characteristics affect children's mental health? (2) Does parental bookreading/number of books affect children's mental health? (3) Does authoritative parenting practice enhance children's mental health? (4) Is parental spank associated with children's mental health? (5) Are there other learning activities (TV watching or outing/museum) associated with children's mental health? Methods: The present study used data collected in Hangzhou,China (n = 233) and Sydney, Australia (n = 29) during 2013-2014. Parenting practice were measured based on the Home Observation for Measurement of the Environment and children's mental health was measured using the Devereux Early Childhood Assessment. Results: 1) When parents read books more frequently, when children have more number of books, when children watched fewer hours of TV, and when children have more outing activities, children tend to have more positive mental health outcomes. However, authoritative parenting practice (more choice was allowed in deciding what foods he/she eats at meal time) was adversely associated with children's mental health. Despite small number of Chinese children in Australia, these children's mental health scores were lower than those in China. Chinese parents in Australia kept fewer books at home, read books less frequently, took outings less frequently, and allowed less TV time to their children than those living in China.

TECHNOLOGY FOR FIGHTING POVERTY
Allison Osika, Daniel Carreon-Camberos, Emily D'Imperio
Category: Social Work, Section 2
Poster: 560
Location: Second Floor Concourse
Time: 1:00 PM-3:00 PM
Mentor(s): Steve Anderson (Social Work)

The purpose of this project is to create a web-site for sharing information on interventions that feature the creative use of technology in helping the poor and other vulnerable groups. One of the difficulties we all face is that the rapid pace of chance makes it difficult to keep up with the tremendous range of emerging ideas. The site is intended to help with this issue by identifying creative projects, briefly highlighting their strategies and accomplishments, and by linking to additional source materials about them. Our site is intended to: stimulate thinking among social change agents about creative intervention strategies, especially those that rely on innovate technology use; serve as a place where students can explore possibilities that technology savvy change agents are creating to help the poor; and provide teachers with easy access to information on

creative technology-focused interventions, so that these can be used as case examples in their courses.

TOXICOLOGY

POSTER PRESENTATIONS, SECTION 1
THIRD FLOOR HALLWAY, 1:00-3:00 PM

EFFECT OF MICRORNA-494 OVEREXPRESSION AND DEHYDROASCORBIC ACID SUPPLEMENTATION ON CHROMIUM (VI)-INDUCED CELL MALIGNANT TRANSFORMATION
Ryan Beyea
Category: Toxicology, Section 1
Poster: 562
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Chengfeng Yang (Physiology)

Hexavalent chromium [Cr(VI)] is a well recognized human carcinogen and one of the most common environmental and occupational pollutants causing lung cancer and other diseases. However, the mechanism of Cr(VI) causing lung cancer has not been elucidated. Preliminary studies in our lab have shown that chronic treatment of human normal bronchial epithelial cells with Cr(VI) induced cell malignant transformation, and that the level of microRNA-494 (miR-494) is drastically reduced in Cr(VI)-transformed cells. Additionally, previous studies showed that ascorbic acid supplementation increases intracellular Cr(VI) reduction and generation of Cr(III), thus enhancing its genotoxic effect. The primary aim of this study was to determine the role of miR-494 and ascorbic acid on malignant transformation. Cultured human bronchial epithelial cells were analyzed regularly during 14 weeks of Cr(VI) treatment by various techniques. It was found that overexpression of miRNA-494 decreases cell malignant transformation, and that ascorbic acid supplementation increased transformation. Based on these results, it can be implied that both miR-494 and ascorbic acid are important players in the mechanism of Cr(VI) carcinogenesis. From these findings, the mechanism behind Cr(VI) malignant transformation can be further investigated to identify molecular targets for effective prevention and treatment of lung cancer resulting from Cr(VI) exposure.

BRIDGE TO PHD IN NEUROSCIENCE PROGRAM
Neco Wilson
Category: Toxicology, Section 1
Poster: 563
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): William Atchison (Pharmacology and Toxicology)

Methylmercury (MeHg) is an environmental toxicant that targets the central nervous system. MeHg neurotoxicity has cell specificity and cerebellar granule cells (CGC's) are the most susceptible targets. Chronic exposure to MeHg can lead to disturbances in sensation, hearing, speech, balance and movement. MeHg toxicity results in dysregulation of Ca_2 concentrations in CGC's and motor neurons. The objective of our study was to compare effects of chronic MeHg exposure in mRNA levels of voltage gated calcium channels (VGCCs) and glutamate receptor alpha-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid (AMPA) in mouse cerebellum (CB) and spinal cord (SC). Comparing the effects of MeHg in receptors that contribute to CA_{2+} dysregulation in neurons can help us elucidate susceptibility differences, after MeHg exposure, in these two regions. AMPAR GluA1 - 4 and VGCC α1A, α1B, α1C and α1E subunit expression were compared between CB and SC. We hypothesized that chronic MeHg exposure would cause more prominent effects in the CB due to the susceptibility of this region to MeHg. 90 day old Balbc mice were exposed to 5ppm MeHg ad lib in drinking water for 6 months. Isolated RNA from 10mg of CB or SC tissue was reverse transcribed and real time qPCR was used to determine the mRNA expression levels of the AMPAR and VGCC subunits.

MODELING THE ROLE OF CONTAMINANTS IN THE COHORT SURVIVAL OF JUVENILE ESTUARINE KILLIFISH (FUNDULUS HETEROCLITUS)
Jacob Young
Category: Toxicology, Section 1
Poster: 564
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Cheryl Murphy (Fisheries and Wildlife)

Subtle changes in the behavior of organisms as a result of exposure to contaminants can have implications for population persistence, particularly if the changes in behavior impair the ability to capture food and avoid predators. However, behavioral change, by itself, is a challenging toxicological endpoint to determine population implications. Individual-based models (IBMs) appear to be a promising approach because they are constructed to simulate the behavior of a collection of individuals, with the

end result being the emergence of a population relevant response. We constructed an IBM to determine how effects of PCB contamination affect the behavior and population dynamics of different populations of juvenile killifish (Fundulus heteroclitus) located along the East Coat of US. We simulated natural conditions of killifish, realistic temperature, prey and predator base, with normal prey capture ability and predator avoidance, and calibrated the model to empirically derived growth rates. We simulated baseline conditions plus exposure to two concentrations of PCBs that show impairments in prey capture ability in PCB-exposed fish to determine overall effect on survival and growth of juvenile killifish cohort. Our simulations demonstrated that subtle changes in behavior can affect population relevant endpoints such as cohort survival and growth rates. These endpoints can be input into matrix population models to project long term population effects.

ACTIVATION OF NRF2 BY TBHQ UPREGULATES IGM PRODUCTION BY LPS-ACTIVATED MOUSE SPLENOCYTES
Jenna Bursley
Category: Toxicology, Section 1
Poster: 565
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Cheryl Rockwell (Pharmacology and Toxicology)

Nuclear factor erythroid 2-related factor 2 (Nrf2) is a transcription factor that is activated by oxidative and electrophilic stress. Recent studies show that Nrf2 plays a role in B cell differentiation and function in response to LPS, a T cell-independent B cell activator. Tert-butylhydroquinone (tBHQ) is a common food preservative and is also used experimentally as an Nrf2 activator. The purpose of the present studies was to determine the effect of tBHQ on IgM production by LPS-activated murine splenocytes from wild-type and Nrf2-null mice. Isolated splenocytes were treated with tBHQ for 30 min prior to activation with LPS. Cells and supernatants were harvested after 48 hours in culture. Total IgM production as well as CD69 and CD25 expression was quantified. Interestingly, tBHQ caused a modest increase in IgM production by LPS-activated wild-type SPLC at low concentrations (0.1 – 1 uM), which was not observed in Nrf2-null splenocytes. In addition, LPS-activated splenocytes from Nrf2-null mice produced significantly less IgM than wild-type, suggesting that Nrf2 upregulates IgM production by LPS-activated splenic B cells. In contrast, tBHQ did not affect CD69 or CD25 upregulation in either genotype and CD69/CD25 upregulation was similar between wild-type and Nrf2-null splenocytes, suggesting Nrf2 does not regulate CD69 or CD25 upregulation. Collectively, this study suggests a novel role for Nrf2 in the regulation of B cell IgM production in vitro. (This work is supported by NIH grant: ES018885.)

EFFECTS OF THE EMERGENT PESTICIDES, DIFLUBENZURON AND SPINETORAM, ON GAP JUNCTIONAL INTERCELLULAR COMMUNICATION, A BIOMARKER OF HOMEOSTASIS, IN A RAT LIVER EPITHELIAL CELL LINE
Ognenka Avramovska, Ajna Uzuni, Kim Vi
Category: Toxicology, Section 1
Poster: 566
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): Brad L Upham (Pediatrics and Human Development)

Gap junctional intercellular communication (GJIC) is a critical cell process needed to maintain the homeostasis of tissues. The disruption of this cell signaling mechanism alters gene expression that has been linked to adverse health effects, including tumor promotion. Thus, determining the effects of environmental toxicants and toxins on the function of GJIC is an potential biomarker of toxicity. Using a simple dye transfer assay in a F344 rat liver oval cell line, we compared the effects of two emergent insecticides used in fruit orchard pest control, diflubenzuron and spinetoram, on GJIC with those of the legacy pesticides, DDT and lindane. Preliminary results indicate that both diflubenzuron and spinetoram dysregulate GJIC that was dose and time dependent. However, these compounds were 2-3 times less potent than the legacy pesticides, DDT and lindane and potentially less toxic to mammalian systems. Further experiments are being conducted to determine if all four of these pesticides dysregulate GJIC through similar or different mechanisms.

ROLE OF REACTIVE OXYGEN SPECIES (ROS) IN 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN (TCDD)-INDUCED TRANSCRIPTION IN HEPA1C1C7 AND CH12.LX CELLS
Caitlin Viele
Category: Toxicology, Section 1
Poster: 567
Location: Third Floor Hallway
Time: 1:00 PM-3:00 PM
Mentor(s): John LaPres (Biochemistry and Molecular Biology)

TCDD is a persistent environmental contaminant of major concern known to cause adverse responses from the cellular to organismal level. Previous studies have suggested that TCDD-mediated responses are a result of activation of a transcription factor within the PAS superfamily, the Aryl Hydrocarbon receptor (AhR). The purpose of this research is to investigate whether TCDD-elicited effects are directly associated with AhR-induction, while little is known regarding the downstream effects of transcription that lead to adverse responses. Previous reports suggest that levels of reactive oxygen species (ROS) may be

increased as a result of exposure to TCDD. In order to further understand the potential role of ROS and its relation to TCDD-induced responses, two mouse cell lines, Hepa1c1c7 (mouse hepatoma cell) and CH12.LX, (lymphoma B cell line) were pretreated with differing ROS scavengers and, following, treated with TCDD (30nM) or a vehicle control. ROS scavengers of interest include Coenzyme Q1 (CoQ1), N-butan-2-yl-1-(2-chlorophenyl)-N-methylisoquinoline-3-carboxamide (pk11195), 4-hydroxy-2,2,6,6-tetramethylpiperidin-1-oxyl (Tempo), N-acetyl cysteine (NAC), and 6-hydroxy-2,5,7,8-tetramethylchroman-2-carboxylic acid (Trolox). This poster presentation will address the changes in transcription levels in the aforementioned cell lines. Such results might better inform the resulting downstream effects of TCDD-induced transcriptional events.

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Many thanks to the dedicated research mentors who guided and supported the undergraduate research and creative activities presented today.

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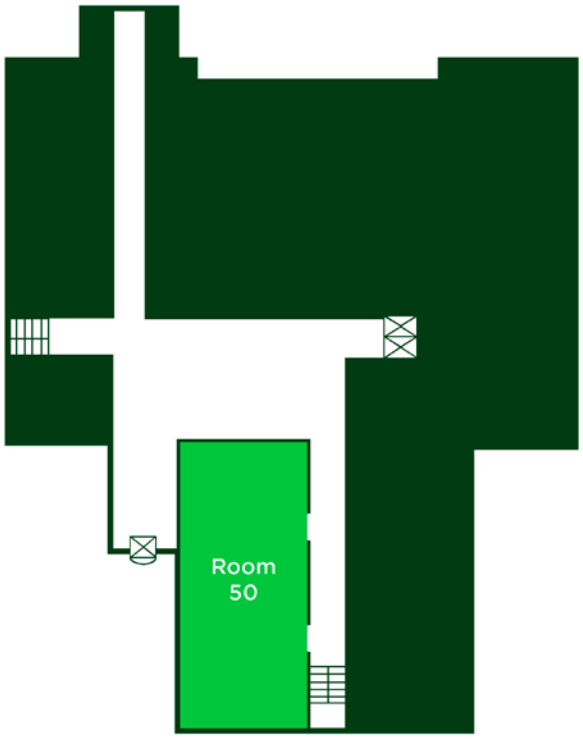
N
W E
S

Ground Floor
(Basement)



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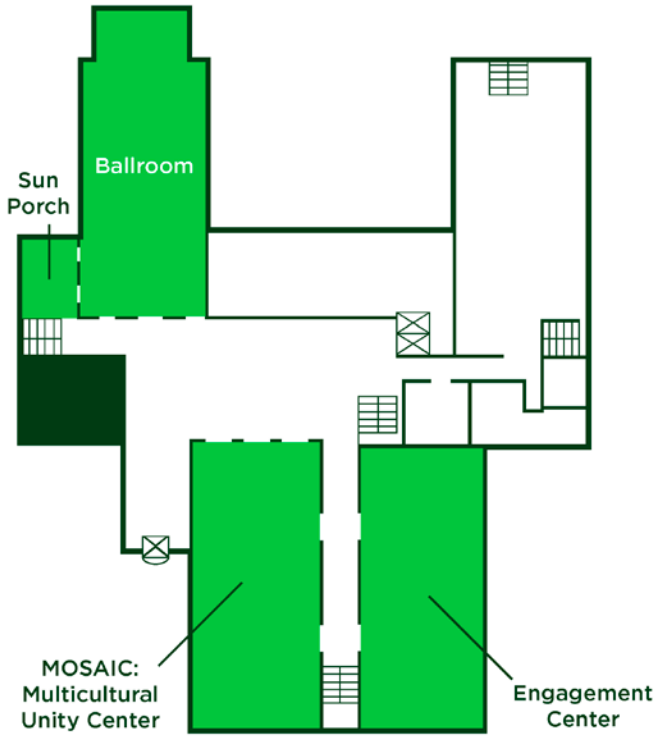
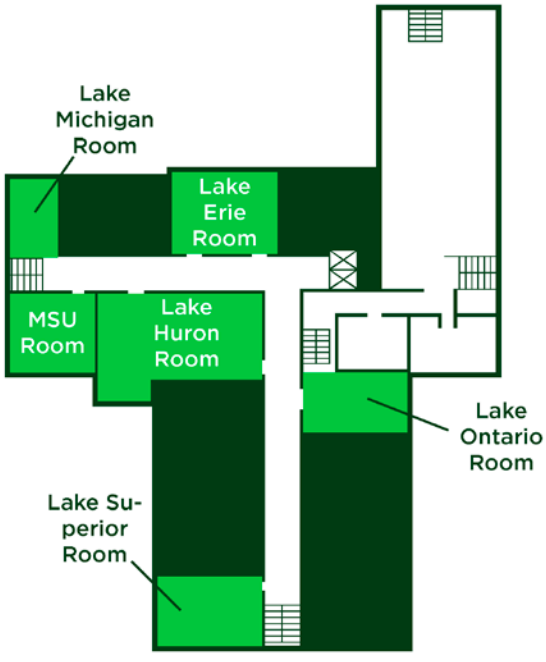
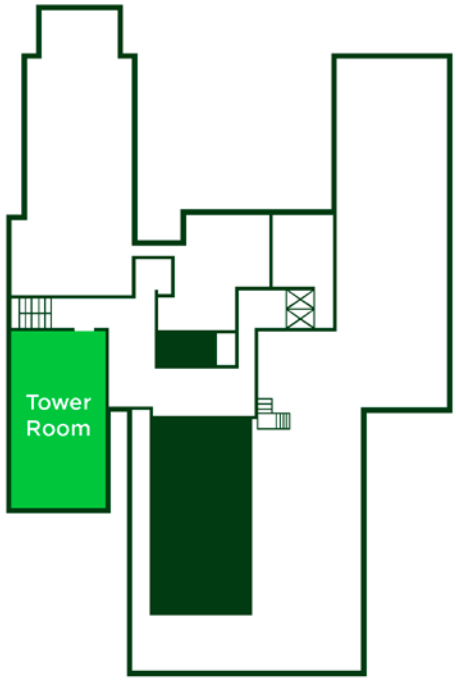


Third Floor



Fourth Floor



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