UNIVERSITY UNDERGRADUATE RESEARCH AND ARTS FORUM

Michigan State University
April 4, 2014

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

Brean Pavlinak, a student member of the AIGA Detroit MSU student group, created the cover design. Various forms of architecture throughout MSU's campus inspired his exploration of the simple geometric forms. The forms interact in the space to create a cohesive consistency while individually representing the diversity of disciplines represented at the forum.

www.detroit.aiga.org

WELCOME

Welcome to the 16th 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 660 students from 13 different colleges participating today. These students were mentored by more than 340 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, Robert Coffey, 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 Brean Pavlinak, '14, who is pursuing a Bachelor of Fine Arts in studio art, and a Bachelor of Arts in media arts and technology with a specialization in game design and development. Brean 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 (i.e., If a group of 4 students wins a first-place award, each member will receive $100 each). 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. If the student does not have any unpaid bills, a check will be sent at the end of the semester.

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.

BEING SPARTAN GREEN

In an effort to be more environmentally conscious, we have made several changes to the UURAF program book. We removed all abstracts from the printed version, which significantly decreased the amount of paper used as well as the printing cost. Programs are organized by category and include QR codes that direct you to the abstracts, which are located online for each section. A full, PDF version of the book is posted on our website and is accessible at http://urca.msu.edu/uuraf/.

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SCHEDULE OF EVENTS

All events occur in the MSU Union

TIME	EVENT	LOCATION
MORNING REGISITRATION, 8:15-9:15 AM		
8:15-9:00 AM 8:30-9:15 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 Room 50
POSTER PRESENTATIONS, SESSION 1, 9:30-11:30 AM		
8:30-9:30 AM 9:30-11:30 AM 11:30 AM - 12:00 PM	Set up posters in assigned locations Display and judging time for posters Students take down their posters	Ballroom Lake Huron Room Mosaic Multipurpose Room
ORAL PRESENTATIONS, SESSION 2, 11:00 AM - 1:00 PM		
10:30-11:00 AM 11:00 AM - 1:00 PM	Download PowerPoint presentations onto room computers Presentations delivered throughout session	Lake Erie Room Lake Michigan Room Lake Superior Room MSU Room Tower Room
AFTERNOON REGISTRATION, 12:15-1:15 PM		
12:15-1:00 PM 12:30-1:15 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 Room 50 Tower Room
POSTER PRESENTATIONS, SESSION 2, 1:30-3:30 PM		
12:30-1:30 PM 1:30-3:30 PM 3:30-4:00 PM	Set up posters in assigned locations Display and judging for posters Students take down their posters	2nd Floor Concourse 3rd Floor Hallway Ballroom Lake Huron Room Mosaic Multipurpose Room
AWARDS CERMONY, 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 9:30-11:30 AM

CATEGORY	SECTION	LOCATION
Agriculture & Animal Science	1	Lake Huron Room
Biochemistry & Molecular Biology	1	Lake Huron Room
Business	1	Lake Huron Room
Cell Biology, Genetics, & Genomics	1 & 2	Mosaic Multipurpose Room
Communication Arts & Sciences	1	Ballroom
Education	1	Ballroom
Engineering, Computer Science, & Mathematics	1 & 2	Ballroom
Environmental Science & Natural Resources	1	Ballroom
Graphic Design	1 & 2	Ballroom
Health, Food, & Wellness	1 & 2	Ballroom
Humanities & Performing Arts	1	Mosaic Multipurpose Room
Microbiology, Immunology, & Infectious Disease	1	Ballroom
Physical Sciences	1	Lake Huron Room
Psychology	1 & 2	Lake Huron Room
Social Science: General	1, 2, & 3	Ballroom
Social Work	1	Mosaic Multipurpose Room

AFTERNOON POSTER PRESENTATIONS

These posters will be displayed 1:30-3:30 PM

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

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
Digital Media	1	Lake Ontario Room
Environmental Science & Natural Resources	1	Lake Michigan Room
Health, Food, & Wellness	1	MSU Room
Humanities & Performing Arts	1	Lake Superior Room
Psychology	1	Room 50
Social Science: General	1	Lake Erie Room

MORNING ORAL PRESENTATIONS, SESSION 2

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

CATEGORY	SECTION	LOCATION
Agriculture & Animal Science	1	Lake Michigan Room
Communication Arts & Sciences	1	MSU Room
History, Political Science, & Economics	1	Lake Superior Room
Humanities & Performing Arts *(Note: session begins at 11:15 AM)*	2	Lake Erie Room
Cell Biology, Genetics, & Genomics	1	Tower Room

AFTERNOON ORAL PRESENTATIONS

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

CATEGORY	SECTION	LOCATION
Agriculture & Animal Science	2	Room 50
Digital Media	2	Lake Ontario Room
Environmental Science & Natural Resources *(Note: session begins at 1:30 PM)*	2	Lake Superior Room
Health, Food, & Wellness *(Note: session begins at 1:15 PM)*	2	MSU Room
Linguistics, Languages, & Speech	1	Lake Michigan Room
Microbiology, Immunology, & Infectious Disease *(Note: session begins at 1:30 PM)*	1	Tower Room
Social Science: General	2	Lake Erie 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

UTILIZATION OF A TARGETED CANDIDATE GENE APPROACH TO IDENTIFY THE GENE RESPONSIBLE FOR LUTESCENT 1 MUTATION OF TOMATO
Julia Miller
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room, 11:00 AM-11:15 AM
Mentor(s): Cornelius Barry (Horticulture)

Chloroplasts serve as sites for photosynthesis and for the synthesis of primary and specialized metabolites. Characterization of chloroplast mutants facilitates understanding of biochemical processes that occur in chloroplasts. The lutescent 1 (l1) and lutescent 2 (l2) mutants of tomato (Solanum lycopersicum) have identical phenotypes indicative of chloroplast defects. They display enhanced rates of chlorophyll loss in leaves and fruits as they age and seedlings are slow to de-etiolate. The l2 mutant maps to tomato chromosome 10 and causes a premature stop codon in a chloroplast targeted membrane-bound zinc metalloprotease of the M50 family of unknown function. The l1 mutant maps to the short arm of chromosome 8 but the underlying gene is unknown. Identifying the underlying gene responsible for the l1 phenotype may allow greater understanding of the role of l2. Based on the similarity of mutant phenotypes between l1 and l2, we hypothesized that l1 encodes a plastid targeted protein and identified seven genes within the l1 mapping interval that had a plastid targeting sequence. Utilizing a combination of PCR amplification of candidate genes from cDNA and genomic DNA, coupled with sequence analysis, the candidate gene for the l1 locus was identified. The L1 gene encodes a predicted membrane localized protein of unknown function that is conserved in higher plants but not in photosynthetic microbes. Current experiments are focused on determining whether the L1 and L2 proteins physically interact using a bimolecular fluorescence complementation assay.

UNDERSTANDING THE PURCHASING DECISIONS OF MID-MICHIGAN RESTAURANTS WITH RESPECT TO LOCAL AND REGIONAL MEATS
Hilary Torres
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room, 11:15 AM-11:30 AM
Mentor(s): William Knudson (Agricultural, Food & Resource Econcomics)

The demand for locally sourced meat products has increased across the country, but the supply chain infrastructure that supports the movement of these meat products into markets is fragmented. Many of the challenges faced by livestock producers and processors within Michigan were reported by the CRFS Livestock Workgroup at Michigan State University. One perspective not well represented in their findings was the consumer end of the supply chain, namely restaurants and retailers. This study was conducted to better understand the meat purchasing decisions of restaurants and determine whether there is a demand for local and regional meats among restaurants within the Mid-Michigan/Lansing area. The restaurants targeted were either independent or white table cloth establishments within a 15 mile radius of MSU. Of the 35 restaurants identified 22 did not respond, 3 declined and 10 agreed to participate. The interviews were based off of a survey developed with a professor, conducted in person, recorded, transcribed, and the responses were analyzed. The findings indicate that among the participating restaurants there is an interest in purchasing meat from local livestock producers and processors. The responses of the restauranteurs suggest that the original assertion, that price and availability are the main barriers preventing restaurants from purchasing locally sourced meats is only partially correct. Other obstacles identified include the time-consuming and somewhat difficult process of purchasing local meats, lack of marketing and complementary services offered, somewhat restrictive processing standards within Michigan and the perceived general lack of consistency in regards to price, quality and supply.

THE EFFECT OF SOIL PH ON HABITAT PREFERENCE OF *CENTRUROIDES SCULPTURATUS*
Lauren Kustasz
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room, 11:30 AM-11:45 AM
Mentor(s): Andy Booms (Zoology), Matthew Rowe (Zoology)

Centruroides sculpturatus, more commonly known as the Arizona bark scorpion, is an arachnid found in the southwestern United States. Field observations made by Dr. Matthew Rowe and colleagues suggest that these scorpions may have a habitat preference for limestone-based soils. Based on these observations, I hypothesized that when presented with the choice between acidic and basic soils to live on, the scorpions would choose basic soil. To test this, I placed sixteen organisms, eight male and eight female, into identical tanks with one side of the tank being composed of acidic soil (pH 5.8) and the other basic soil (pH 7.8). After observing the scorpions three times a day for three consecutive days, I found the males on acidic soil 50 out of 67 observations and the females on basic soil 31 out of 50 observations. Based on these data, I found there to be a relationship between soil preference and scorpion gender, males preferring acidic soil and females preferring basic (chi-square test for independence: $p<0.0001$, df=1, $N=117$). These results indicate that there may be physiological or behavioral differences between male and female scorpions that cause them to respond differently to soil pH.

PHENOLOGY OF *RHAGOLETIS JUNIPERINA* ON THE MSU CAMPUS
Megan Frayer
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room, 11:45 AM-12:00 PM
Mentor(s): Jim Smith (Entomology)

Rhagoletis juniperina Marcovitch (Diptera: Tephritidae) infests local Eastern Red Cedar trees (*Juniperus virginiana* L.). This fly is of interest to scientists because it may be a link between the North American and European *Rhagoletis* fauna, many of which are agricultural pests in Michigan orchards. The basic biology of *R. juniperina*, including emergence characteristics and infestation patterns, is relatively poorly characterized. During fall 2010, juniper berries were collected from several sites around East Lansing to locate a local population of *R. juniperina*. A site with a large infestation was identified near the Farm Lane Bridge on the MSU campus. To determine larval infestation rates and periods of infestation, juniper berries were collected weekly from late-August to mid-November 2011 and again in 2012 at the Farm Lane Bridge site. A "peak" infestation time was found in approximately the first week of October and the post diapause eclosion time was found to be approximately 110 days. This longer PDET and a later peak infestation time than most *Rhagoletis* species. *R. juniperina* populations were also located in Wisconsin and North Carolina, suggesting that the species may be more prevalent than previously thought. Parasitoids were found in the collections, both a pupal parasitoid (*Coptera*) and an egg parasitoid (*Utedes*). The parasitoid wasps seem to have a slightly longer PDET. Preliminary genetic data on the populations from MI, WI and NC suggest that there is some variability in the population, with as much as 3-4% variation from an Ontario population from the Barcode of Life database.

TIME IS MONEY…BUT SO ARE EGGS
William Ratledge
Category: Agriculture and Animal Science, Section 1
Location: Lake Michigan Room, 12:00 PM-12:15 PM
Mentor(s): Catherine Ernst (Animal Science)

This project involved the assessment of the fiscal efficiency of a cage-free brown layer operation in Donovan County, IL, in relation to time spent collecting floor eggs vs profit retained by collecting floor eggs. Records of daily floor egg totals and the amount of time spent collecting floor eggs were collected from each of 12 layer houses and standardized on a least-cost vs least profit basis ($0.12/min of collection and $0.10 profit/recovered floor egg). Floor egg collection averages, average time costs, and net profit were calculated on a daily basis for all houses and upon a cyclic basis (2 years) for all houses with records for the past two years (2011-2013). Floor egg statistics between houses were compared on a percent of total production basis for all 12 houses, and on a peak production basis (hen age 30-42 wks) for houses with records spanning 2011-2013. Houses were then ranked by cost efficiency and all values were compiled to give a total for the entire operation. After all evidence had been collected, the total operation and floor egg management system were revealed to have saved the company over $14,000 on a least cost/least profit basis.

ORAL PRESENTATIONS, SECTION 2

EVALUATION OF SORGHUM-HYBRID GRASSES AS ANNUAL FORAGE SYSTEMS FOR LAMB PRODUCTION
Anna Makela
Category: Agriculture and Animal Science, Section 2
Location: Room 50, 1:00 PM-1:15 PM
Mentor(s): Richard Ehrhardt (Animal Science)

Grazing lambs can be an inexpensive rearing system and attractive option for producers. However, summer grazing presents several challenges, particularly lack of forage quality and quantity, which are limiting factors in perennial pastures. Sorghum-hybrids introgressed with the brown midrib gene (BMR) are excellent candidates for summer annual forage due to affinity for warm weather and high yields of quality forage. Therefore, we sought to examine whether BMR sorghum-hybrid annual pastures could be utilized efficiently by grazing lambs and provide forage of sufficient quality to support high lamb gains per acre. Two hybrids (BMR sorghum-sudan [SOR] and BMR sudan [SUD]) were planted with forage soybeans in three

replicates. Lambs were grazed over a 25-day period, (n=14 lambs/replicate, starting weight mean=62.5 lbs) with bouts lasting 4-5 days. Each bout, forage mass was measured pre- and post-grazing by clipping 4 quadrants/replicate and lamb bodyweight gain recorded. Sorghum/sudan dominated stand composition, with negligible soybean contribution. Both mixes produced high yields; however, SOR was significantly greater (15110 lb/acre), compared to SUD (11548 lb/acre, $P<0.05$) with similar total utilization per acre. Lambs grew faster on SUD (0.302 lb/d) than on SOR (0.203 lb/d), likely because of higher DM intake (3.99% bodyweight, SOR vs. 4.04 % bodyweight SUD, $P<0.05$). Lamb gain potential was high for both mixes at 669 lbs/acre for SOR and 706 lbs/acre for SUD. The results suggest that warm-season grasses have excellent potential as annual summer forage for lambs when grazing is carefully managed.

THE EFFECT OF INTERSPECIFIC COMPETITION IN RELATION TO RISK ASSESSMENT ABILITY OF *CENTRUROIDES SCULPTURATUS*
Benjamin Bailey
Category: Agriculture and Animal Science, Section 2
Location: Room 50, 1:15 PM-1:30 PM
Mentor(s): Matthew Rowe (Zoology)

Different species of scorpions exhibit different aggressive behavior levels naturally. One species of scorpion, *C. sculpturatus*, exhibits more submissive and errant behaviors than other scorpions. We investigated whether *C. sculpturatus* displays errant behavior due to some sort of cognitive or reactive risk assessment ability, which allows them to observe and change behavior based on environment. We hypothesized that the amount of time spent exhibiting aggressive behavior by the scorpion *C. sculpturatus* will depend on the level of competition it is exposed to. We predicted that *C. sculpturatus* will exhibit fewer occurrences of aggressive behaviors than *H. spinigerus*. We also predicted that *C. sculpturatus* will spend less time being aggressive when paired with *H. spinigerus* than when paired with other *C. sculpturatus*, and that the targeted *C. sculpturatus* will choose to flee when confronted by *H. spinigerus* rather than engaging in aggressive behavior. When we placed *C. sculpturatus* and *H. spinigerus* in the same tank and recorded their behaviors over fifteen minutes, we found that *C. sculpturatus* exhibited more aggressive behaviors when placed with *H. spinigerus* than when placed with its own species (78.85 ± 23s vs. 1.25 ± 23s, $p<0.05$). This indicates that *C. sculpturatus* has the ability to assess risk. This conclusion helps describe the errant behavior of *C. sculpturatus* and how it chooses to live within its wild habitat. It helps lend to the knowledge pool surrounding scorpion behavior, and will allow future researchers to enter research environments with a specific expectation of how *C. sculpturatus* will behave.

SOYBEAN CYST NEMATODE DEVELOPMENT ON DRYBEANS
Anna Stouffer
Category: Agriculture and Animal Science, Section 2
Location: Room 50, 1:30 PM-1:45 PM
Mentor(s): Martin Chilvers (Plant, Soil & Microbial Sciences)

Michigan is one of the top dry bean producing states; in the 1980s when soybean cyst nematode, *Heterodera glycines*, was first discovered in Michigan the major concern was the effect it would have on the dry bean industry. The point of this study was to measure development and fecundity of *H. glycines* on ten dry bean classes representative of the diversity of beans produced in Michigan. The beans were planted in conetainers, inoculated with a suspension of *H. glycine* eggs, then incubated in a growth chamber for 8 weeks at 26°C and 16 hours of light a day. Centrifugal flotation was used to extract the nematodes then counts were made of cysts, live females, males, and second stage juveniles in each sample to determine the levels of development. Ten cysts were picked, crushed and eggs and second stage juveniles were counted to measure fecundity. The white kidney bean Beluga, red kidney bean Red Hawk, and pinto bean Othello had cyst development significantly above the susceptible soybean. The other classes were below or near the susceptible soybean. The black bean Zorro, pinto bean Santafe, and Great Northern bean Matterhorn, had notably less development than all other classes. The fecundity of all bean classes was between 60-120eggs/cyst. All bean classes were susceptible to *H. glycines*. From a development stand point the kidney beans, and the pinto bean Othello were more susceptible than the susceptible soybean control. All classes responded similar in fecundity to the PI88788 soybean at 120 eggs/cyst.

DIFFERENCES IN OPEN FIELD TEST RESPONSES AND FEATHER PECKING BETWEEN MALE AND FEMALE COMMERCIAL TURKEYS
Rachel Baumgardner
Category: Agriculture and Animal Science, Section 2
Location: Room 50, 1:45 PM-2:00 PM
Mentor(s): Marisa Erasmus (Animal Science), Janice Swanson (Animal Science)

A main concern in commercial turkey welfare is feather pecking (FP), which results in carcass and tissue damage. This study aimed to 1) examine sex differences in fear using the open field (OF) test, and 2) evaluate associations between FP and turkeys' OF responses. Turkeys were housed in groups of 20-22 and video recorded at 11 days old. Instantaneous scans were conducted at 5 min. intervals to identify birds that developed FP (PECK) and birds that did not (NPECK). At 4 and 5 weeks, respectively, males (N=56) and females (N=57) were individually tested in an OF test arena (2.74x2.74 m) for 10 min.

Behavior was recorded and analyzed for ambulatory latency, vocalization latency (both analyzed using LIFETEST procedure in SAS) number of steps taken, defecations, vocalizations, and squares entered (analyzed using the Mann Whitney U test). Mean (±SE) latency to ambulate and vocalize was longer for males (300.9±29.0 sec, 156.8±27.2 sec) than females (211.3±29.1 sec, 40.6±10.7 sec). All other OF responses (median and interquartile range) were higher for females than males (number of: steps: 43, 22-115 vs. 20, 0-74, U=2685, P=0.047; squares: 9, 3-28 vs. 3, 0-18, U=2851.5, P = 0.047; vocalizations: 484, 337-638 vs. 229.5, 77-398, U=2369.5, P < 0.0001). OF behavior did not differ between PECK and NPECK birds. Results reveal that male and female turkeys differ in OF responses, suggesting that they have different fear responses. Fear and FP do not appear to be related because no significant differences were found between PECK and NPECK turkeys.

WITHIN-DAY ALTERATION OF RATION STARCH FERMENTABILITY HAD NO EFFECT ON FEED INTAKE, TOTAL-TRACT NEUTRAL DETERGENT FIBER DIGESTIBILITY, AND MILK FAT CONCENTRATION OF COWS IN LATE LACTATION
Bethany Oglesby
Category: Agriculture and Animal Science, Section 2
Location: Room 50, 2:00 PM-2:15 PM
Mentor(s): Michael Allen (Animal Science)

The objective of this experiment was to evaluate effects of feeding lactating dairy cows diets differing in starch fermentability twice per day on dry matter intake (DMI), total-tract neutral detergent fiber (NDF) digestibility, and milk fat concentration. Feeding highly fermentable starch sources to ruminants is expected to increase short-chain fatty acid production by rumen microbes, increase propionate flux to the liver during meals, and potentially decrease ruminal pH, NDF digestibility, and milk fat concentration. Sixteen multiparous cows (291 ± 68 DIM) were used in a crossover design experiment with 14d. Cows were offered diets containing either dry corn grain (DC, less fermentable) or high moisture (67.4% DM) corn grain (HM, more fermentable) at 0900h and 1700h each day in opposite sequences 1) HM at 0900h, DC at 1700h and 2) DC at 0900h, HM at 1700h. Sequence DC:HM tended to increase the amount of DMI following the morning feeding (10.6 vs. 9.7kg, P=0.07) and decrease DMI following the afternoon feeding (14.4 vs. 15.4, P=0.08) compared with HM:DC, resulting in no overall effect of treatment (P>0.15). Treatment did not affect digestibility of NDF or DM, or yields or composition of milk. Lack of treatment effects on digestibility of NDF and concentration of milk fat indicate that buffering capacity of rumen contents was likely adequate to maintain ruminal pH during the morning when digesta mass is normally lowest. These results indicate that potential advantages to altering ruminal starch fermentability within a day are minimal for late lactation cows.

POSTER PRESENTATIONS, SECTION 1

PREDATORY STING RATES: COMPARING THE SEXUALLY DIMORPHIC STRIPED BARK SCORPION, *CENTRUROIDES VITTATUS*
Allison Gerras, Cody Eggenberger, Dalton George
Category: Agriculture and Animal Science, Section 1
Poster: 1
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Matthew Rowe (Zoology), Chad Zirbel (Plant Biology)

Sexual dimorphism can be seen in many different types of species for a variety of reasons. Often times the reason for sexual dimorphism is not fully understood. In the scorpion species, *Centruroides vittatus*, we hypothesize that predatory behavior is different between male and females. After a period of starvation, both males and female *Centruroides vittatus* were fed crickets and the capture time as well as the number of stings was recorded for each trial. This was done to determine possible differences in the scorpion's predation preferences. By conducting t-tests, we found no significant difference between male and female *C. vittatus* in either capture time or number of stings. Using a chi-squared test, we did not find that there is a statistical difference when comparing the total number of successful male versus female captures. Therefore, we cannot conclude that female *C. vittatus* scorpions are more likely to attack prey.

EFFECT OF WEANING AGE ON BEHAVIOR OF ARABIAN FOALS
Caelah Doerr, Erika First, Jennie Lubbers, Lynn Nagengast, Rhiannon Pokriefka
Category: Agriculture and Animal Science, Section 1
Poster: 3
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Jennifer De Vries (Animal Science), Elizabeth Karcher (Animal Science), Nathalie Trottier (Animal Science)

Separating a foal from its mother in order to promote independence in behavior and food choice, also known as weaning, is one of the most stressful times in a foal's life. Horses are commonly weaned between four and six months of age, but understanding the age at which the least amount of negative post-weaning behaviors occurs can improve the weaning process on commercial breeding farms. The hypothesis of this study was that foals weaned at five to six months would exhibit more positive post-weaning behaviors, such as a reduction in vocalization, than foals weaned at four months. The objectives of this study were to 1) teach members of the Animal Science Undergraduate Research Student Association

behavioral research methods; 2) discover pre- and post-weaning behaviors of four to six month old foals; 3) learn which time period seems to exhibit the least amount of post-weaning stress behaviors. Behavioral responses of ten foals at the MSU Horse Teaching and Research Farm were recorded one hour per day, one week prior and post-weaning as well as six hours for weaned foals on the day of and two days after weaning. The study was conducted during October of 2013. All behavioral observations were recorded outside in horse paddocks from a distance with zero interaction, according to a pre-designated chart of behavioral descriptions. The results are expected to support the hypothesis and will be presented upon completion at the forum.

VETERINARY MEDICINE IN HAVANA AND DETROIT
Krista Rodriguez
Category: Agriculture and Animal Science, Section 1
Poster: 4
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Rene Hinojosa (Urban and Regional Planning)

The healthcare system in Cuba is praised for its accessiblity and effectiveness. However little is known when it appplies to animals and theif treatment. This research compares and contrasts the different aspects of Veterinary Medicine and animal health in Michigan and Havana to identify weaknesses and strengths. Based on personal visits and observations to both Havana and Detroit clinics, it appears that Havana practices focused almost soley on treatment while the Detroit clinics practices both prevention and treatment, and thus the animals usually had less problems with parasites, wounds, and were overall cleaner. However, the pets in Havana often have less problems with obesity, and had access to a lot more exercise and freedom than most pets I saw in the Detroit clinic.

FEEDING THE FUTURE
Madeline Judge
Category: Agriculture and Animal Science, Section 1
Poster: 5
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Matt Raven (Community Sustainability), Laurie Thorp (RISE)

Since the Sense of Community Questionnaire was created in 1986, there has been extensive research into young students' sense of belonging and their overall success. However, there has been limited research on undergraduate students' sense of community at university. This research investigated the link between sense of community and food among students living in Bailey Hall. During Fall Semester 2013, twelve first-year undergraduate students were selected based on their membership in the Residential Initiative for the Study of the Environment (RISE) program and their level of participation in program events as of October 2013. One-on-one interviews with selected students were conducted, and gathered information about the student's demographic background, what the word "community" means to them, and their current sense of community at MSU. Preliminary interview responses showed that students who participated in RISE events, engaged with peers and faculty, and took advantage of opportunities to get involved on campus felt a strong connection to the RISE community and to MSU. During the months following the initial interviews, community-building activities focused on food and agriculture were staged. These activities were intended to provide a space for students to connect with peers and faculty through the spectrum of food production, preparation and consumption. Students will be interviewed again during Spring Semester 2014 to assess changes in their perception and definition of community. The researchers expect to see a greater sense of community among interviewed students in their Spring 2014 responses compared to Fall 2013.

DETERMINING THE MECHANISM OF COLORADO POTATO BEETLE (*LEPTINOTARSA DECEMLINEATA*) RESISTANCE TO NEONICOTINOID INSECTICIDES BY REAL TIME PCR
Katherine Demeuse
Category: Agriculture and Animal Science, Section 1
Poster: 6
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Zsofia Szendrei (Entomology)

The Colorado potato beetle (*Leptinotarsa decemlineata*) is the main insect defoliator of potatoes, a crop that is an important nutritional resource worldwide. With increased pesticide application to control the insect, Colorado potato beetles have developed a resistance to all synthetic insecticides currently available to growers. Identifying the specific genes that are involved in the mechanism of this resistance is extremely important for the control of the pest, because this will allow for additional research into finding more effective control methods. RNA was extracted from four separate beetle strains kept in the laboratory, one strain was susceptible and three were resistant to neonicotinoid insecticides. Using TRIzol Reagent, RNA was extracted from multiple generations before and after insecticide exposure. Real time PCR was performed, which showed either an up or down regulation of specific genes. With each generation that becomes more resistant, it is hypothesized that there will be certain genes that will be more up regulated and some that are down regulated compared to a control housekeeping gene and the susceptible beetle strain.

THE RESULT OF EVOLUTION IN BIRD TALONS AND FELINE CLAWS
Douglas Bretz
Category: Agriculture and Animal Science, Section 1
Poster: 7
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

Evolution has caused animals to develop in ways that benefit their survival specific to the environment in which they live. For example, the claws of cats are sharp and pointed, allowing them to tear through flesh of their prey. Parrots have talons that are designed to allow them to grip branches and climb with ease. This can be attributed to their mostly vegetarian diet. The molecular structure of a cat's claw and a bird's talon will likely differ due to their specific functions. I will be examining the talons of a parrot and the claws of a cat under a scanning electron microscope to observe the difference in structure between these two animals. The claws of a cat will likely be made up of a more dense molecular composition since they are used for tearing and ripping while the talons of a parrot will likely show a less dense molecular structure suited for climbing and gripping. The data I gather will show support for the theory of evolution in that as animals develop new traits, the traits that benefit them the most in their habitat are traits that are passed on to their offspring; such as the molecular structure of claws and talons.

UGS 200H HONORS RESEARCH SEMINAR
Shayne Miller
Category: Agriculture and Animal Science, Section 1
Poster: 8
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Carl Boehlert (Chemical Engineering & Materials Science)

Photons are the particles responsible for the electromagnetic spectrum. Opals are a unique mineral as they reflect photons at certain angles to create the full range of visual light. This is due to an abnormal structure that differs from other substances' solid formation. Opals are composed of silica, or silicon dioxide, a substance that is tetrahedral in bonding shape, which can create a stable but irregular solid. By studying the structure of opals, the path of photons moving at the speed of light can be deduced. Using a scanning electron microscope, the fine texture of the opal can be observed at measurements of a few nanometers. These observations can help to understand the way light travels and interacts with matter, particularly, silica.

POSTER PRESENTATIONS, SECTION 2

IMPACT OF A SIMPLIFIED MICOBIOME ON THE ARABIDOPSIS IMMUNE RESPONSE
Alan Mundakkal
Category: Agriculture and Animal Science, Section 2
Poster: 10
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Sheng-Yang He (Plant Research Laboratory)

Vascular land plants are rooted in rich microbial soil communities that influence growth, development and immunity of plants. Preliminary experiments reveal that pathogen-associated molecular pattern (PAMP)-triggered immunity is compromised in axenic Arabidopsis. The aim of this study is to determine whether a simplified community can rescue axenic Arabidopsis and promote the development of a more robust immune system. To establish a repertoire of Arabidopsis-associated microbiota from which simplified communities can be built, ~250 bacterial isolates were obtained from Arabidopsis leaf tissue and identified by 16S rRNA gene sequencing. In parallel, we identified the metabolically active members of Arabidopsis leaf-associated microorganisms by deep-sequencing of small RNA, which includes bacterial ribosomal RNA. Bacterial ribosome RNA sequences were matched to our 16S rRNA database of Arabidopsis leaf-associated isolates and the NCBI non-redundant nucleotide database. The most abundant and metabolically active bacteria were determined to belong to Pseudomonas, Burkholderia, Variovorax, and Paenibacillus. Simplified communities were chosen based on their predicted metabolic activity in Arabidopsis and were incorporated into the soil in which axenic seeds were sown. After maturation of the plants, a series of immune assays are performed to determine to what magnitude a flagellin peptide component (flg22) can elicit an immune response. Immune responses will be measured based on reactive oxygen species production, callose deposition and defense gene expression in the plant. Immune response results will help characterize the effect of the simplified microbial communities and in the future may contribute to the development of a probiotic to improve plant defense systems.

EFFECT OF WEANING AGE ON THE GROWTH OF ARABIAN FOALS
Erika First, Caelah Doerr, Lauren Lauwers, Danielle Linihan
Category: Agriculture and Animal Science, Section 2
Poster: 11
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jennifer DeVries (Animal Science), Elizabeth Karcher (Animal Science), Nathalie Trottier (Animal Science)

Separating a foal from its mother in order to promote independence in behavior and food choice, also known as weaning, is one of the most stressful times in a foal's life. Horses are commonly weaned between four and six months of age, but understanding the age at which the best post-weaning growth occurs can improve the weaning process on commercial breeding farms. The hypothesis of this study was that foals weaned at five months of age would exhibit better growth than foals weaned at four months. The objective of this study was to compare the growth of foals weaned at four or five months, while teaching members of the Animal Science Undergraduate Research Student Association foal and mare handling skills and foal measurement techniques. Growth measurements of ten Arabian foals at the MSU Horse Teaching and Research Farm were recorded twice a week for three weeks prior to weaning and through seven months of age. The study was conducted from October to December 2013. Body weight was recorded using a walk-on electronic scale. The additional measurements of hip height and wither height were measured using a height measuring stick while heart girth, body length, and cannon circumference were taken with measuring tape. The results are expected to support the hypothesis and will be presented upon completion at the forum.

THE EXAMINATION OF PHYTOHEMAGGLUTININS IN FAST COOKING DRY BEANS (*PHASEOLUS VULGARIS* L) OF THE ANDEAN DIVERSITY PANEL
Elizabeth Ingle
Category: Agriculture and Animal Science, Section 2
Poster: 12
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Karen Cichy (USDA-ARS, Plant, Soil and Microbial Sciences), Yasmin Salat (USDA-ARS, Plant, Soil and Microbial Sciences)

Dry beans (*Phaseolus vulgaris* L) are a nutrient dense resource for protein and micronutrients needed in all life stages of human health. To make these nutrients available to humans, the dry bean must first undergo a thermal transformation. Cooking with hot water (thermal hydrolysis) is the most commonly employed method used by households, which serves to enhance dry bean digestibility by solubilizing the fibrous seed coat and catalyzing the gelatinization of starch granules. Equally important, thermal hydrolysis also deactivates and destroys the dry bean's naturally occurring defense mechanisms, including lectins (phytohemagglutinins) and protease inhibitors (trypsin and chymotrypsin inhibitors). If consumed, these biochemically active molecules can interfere with nutrient bioavailability by stimulating a variety of allergic reactions within the digestive system. Despite its nutrient value, long cooking times limit the purchase and consumption of dry beans worldwide. This is especially true for the nations of East Africa where wood is a major source of cooking fuel and is often expensive or scarce. This study begins to evaluate the cooking time potential of a panel of Andean fast cooking bean lines from diverse market classes in major bean growing and bean consuming regions of Africa and the Americas. Our study also explores the relationship between changes in dry bean cooking time and human health by comparing the loss of phytohemagglutinin concentrations in faster, normal and slower cooking genotypes within the different market classes of an Andean Diversity Panel.

EXPRESSION PATTERNS OF ABLIM1 AND ATF4 DURING SKELETAL MUSCLE DEVELOPMENT OF YORKSHIRE-LANDRACE CROSSBRED PIGS
Meredith Woodward
Category: Agriculture and Animal Science, Section 2
Poster: 13
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Cathy Ernst (Animal Science)

Fetal myogenesis and postnatal skeletal muscle hypertrophy in growing pigs are critical yet poorly understood processes. A transcriptional profiling study was previously performed to identify genes differentially expressed during fetal and postnatal development of longissimus dorsi (LD) muscle in Yorkshire-Landrace (YL) crossbred pigs. Two differentially expressed genes, actin binding LIM protein 1 (ABLIM1) and activating transcription factor (ATF4), which function in cytoskeleton organization and gene transcription, respectively, were selected for further evaluation. Our specific aim was to confirm the expression patterns for ABLIM1 and ATF4 in LD muscle of YL pigs at 57, 70, 90 and 105 days of gestation, and at birth, 7 and 35 days postnatal. Total LD RNA isolated from fetuses or piglets of gilts at each developmental stage (n=5-6) was used in qPCR assays with TaqMan chemistry to evaluate expression patterns for ABLIM1 and ATF4. Results of qPCR analyses confirmed the expression patterns for both ABLIM1 and ATF4. Abundance of ABLIM1 mRNA was lower in postnatal LD muscle verses fetal ($P < 0.01$), whereas ATF4 mRNA abundance was higher postnatally ($P < 0.001$). While little is known about the role of ABLIM1 in skeletal muscle, the ATF4 protein has been shown to be involved in transcription of amino acid transporters and to play a role in protein synthesis. Thus, increased expression of ATF4 in postnatal LD muscle may support a role for this gene in muscle hypertrophy. This study provides new information regarding ABLIM1 and ATF4 expression during pig skeletal muscle development.

INCREASED SUSCEPTIBILITY OF SKIN FROM HERDA (HEREDITARY EQUINE REGIONAL DERMAL ASTHENIA) HORSES TO COLLAGENASE DEGRADATION -A MECHANISTIC EXPLANATION FOR SOLAR-INDUCED LESIONS
Aleksa Sedlak
Category: Agriculture and Animal Science, Section 2
Poster: 14
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Steven Arnoczky (Small Animal Clincal Sciences), Ann Rashmir-Raven (Large Animal Clinical Sciences)

Hereditary equine regional dermal asthenia (HERDA) is a genetic collagen disorder resulting in fragile, hyper-extensible skin and the occurrence of slow-healing wounds. The predominance of skin lesions occur on the dorsum of HERDA horses which is postulated to be due to increased exposure to sunlight of these areas. However, the precise pathological mechanism which causes this to occur is unclear. We hypothesize that the increase in collagenase production normally associated with the exposure of dermal fibroblasts to sunlight will significantly degrade the material properties of skin from HERDA horses when compared to unaffected controls. Full-thickness skin samples from similar locations of 3 unaffected and 3 HERDA horses (euthanized for other reasons) were collected and frozen. Thawed samples from each animal were cut into uniform strips and their material properties (tensile modulus) determined by mechanical testing before (n=12 samples/horse) or after (n=12 samples/horse) incubation in bacterial collagenase at 37°C for 6 hours. The change in modulus due to collagenase treatment was then compared between HERDA and control horses using a t-test. The modulus of the HERDA horses decreased significantly more than unaffected horses following 6 hours of collagenase treatment (60±3% versus 23±15%, p=0.016). The significant decrease in the modulus of skin from HERDA horses following collagenase exposure suggests that their altered collagen microarchitecture is more susceptible to enzymatic degradation and may explain the localization of skin lesions in HERDA horses to those areas of the body most exposed to sunlight. These findings support sunlight restriction in HERDA horses.

ENERGY ALLOCATION IN GREAT LAKES TROUT
Rachel Preuss
Category: Agriculture and Animal Science, Section 2
Poster: 15
Location: Lake Huron Room, 1:30 PM-3:30 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). Results suggest that lake trout from different stocks show different energy allocation patterns within the common environments. These patterns make sense when put into context of wild counterparts, suggesting that energy allocation patterns have a heritable component. These results have implications for rehabilitation of lake trout populations in the Great Lakes using stocked fish.

A COMPARISON OF URBAN AGRICULTURE PARTICIPATION IN THE UNITED STATES AND CUBA
Lisa Dinon
Category: Agriculture and Animal Science, Section 2
Poster: 16
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Rex LaMore (Urban and Regional Planning)

In the United States, gardening projects are becoming increasingly popular in households and communities. Gardens are maintained for a variety of reasons and are an important means of providing healthy food with minimal economic and environmental cost. They can help build positive relationships among neighbors, provide a nutritious food source in food desert areas where access to food is limited, as well as provide an inexpensive alternative to purchasing groceries, an appealing draw in low-income areas. This research aims to investigate the motivations of people participating in urban agriculture projects, specifically focusing on whether or not income is a factor in a person's decision to garden. The research will compare urban gardening in Lansing, Michigan and Havana, Cuba based on observations and interviews conducted in both places, with the hope of determining the role of income in urban agriculture participation rates. In this presentation I will describe the significance of income as a factor in the decision of Lansing community members to participate in urban agriculture projects and will explain how this compares to the motivations of urban gardeners in Havana.

ASSESSING CURRENT PRACTICE KNOWLEDGE ABOUT RECRUITING CHILDREN TO PARTICIPATE IN PROGRAMS TO PREVENT MENTAL ILLNESS AND/OR SUBSTANCE ABUSE
Olivia Ehret
Category: Agriculture and Animal Science, Section 2
Poster: 17
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Joanne Riebschleger (Social Work)

Millions of American children live with a parent with a mental illness such as anxiety, depression, bipolar disorder, and schizophrenia. Many more live with a parent with and/or a substance abuse disorder such as alcohol, cannibus, and opiate abuse. A number of studies in prevention science show that prevention can help children stay on a healthier developmental trajectory. Children may benefit from information and support provided by such programs. However, it is also reported in the practice community that it is difficult to recruit children to participate in prevention programs. The purpose of this study is to examine what is known about the processes of recruiting children and youth to participate in programs to prevent mental illness and/or substance abuse. The research team examined professional literature related to prevention program recruitment processes. The data were analyzed for content analysis with respect to successful recruitment strategies and barriers to recruitment. This data was then used to prepare a survey instrument completed by a sample of prevention program professionals. The sample was drawn from organizational websites and as identified in the research literature about prevention programs. The data shall be analyzed for respondent-identified recommendations for overcoming recruitment barriers toward successful recruitment processes.

POSTER PRESENTATIONS, SECTION 3

MORPHOMETRIC AND GENETIC ANALYSIS OF A SPECIES OF STICKLEBACK FISH THAT HAVE UNDERGONE DIVERSIFICATION
Ellyse Cipolla
Category: Agriculture and Animal Science, Section 3
Poster: 18
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jenny Boughman (Zoology)

Species diversification is generally a slow process, however, rapid diversification has been documented and studied in the threespine stickleback (*Gasterosteus aculeatus*). Species diversification in the threespine stickleback has become widespread in many areas around the world. One particular area of scientific focus for species diversification in the threespine stickleback is Lake Konstanz in Switzerland. In the last 140 years the stickleback in Lake Konstanz have been undergoing species diversification into two distinct ecotypes: lake and stream. To determine if these ecotypes have actually undergone species diversification, we studied morphological and genetic differences between the two suggested ecotypes. To characterize shape we used standard morphometric methods. We used two morphometric programs: the TpsDIG2 program which we used to place landmarks on pictures of fish that were sampled from Lake Konstanz, and a second program called PAST, which builds a consensus image and computes relative warps. From the morphometric analysis we can compare the landmarks across species and sexes to determine if fish shape differs. If shape differs between ecotypes this means the sticklebacks have adapted to their distinct environments and have undergone species diversification. We also wanted to see if genetically there is a difference between the two ecotypes. To study this we took fin clips from the fish samples and extracted DNA from the tissue for genotyping using the RAD tags method. This research suggests that the sticklebacks in Lake Konstanz have undergone diversification and can be characterized into two distinct ecotypes.

WHICH IS THE BEST CHICKEN SHAMPOO? PREFERRED DUSTBATHING SUBSTRATES FOR AVIARY-HOUSED LAYING HENS
Samantha Dorey
Category: Agriculture and Animal Science, Section 3
Poster: 19
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Dana Campbell (Animal Science), Janice Siegford (Animal Science)

Phasing out of traditional battery cages in commercial laying hen facilities has introduced new aviary-style systems giving hens access to a litter area for expression of natural behaviors such as dustbathing. Dustbathing removes excess lipids from feathers, dislodges parasites, and maintains the functionality of this protective covering. Different litter substrates may vary in their appeal, leading to disparity in dustbathing frequency but optimal substrates for aviary cages are unknown. To test for dustbathing variation we used Bovans white layer hens populated at 144 sq inches/bird (144 birds/cage) in sixteen aviary enclosures at Michigan State University?s Laying Hen Facility. Hens were exposed to one of three litter substrates: Astro-turf, straw, or woodshavings, with bare concrete floor as a control. Each treatment was replicated four times. Video recordings were taken for two days from 10:00 to 20:00 at four significant times in the hen?s lives. We observed the number of hens dustbathing across a 2-min window every twenty minutes for each day recorded. A mixed-design ANOVA showed a significant effect of substrate ($F_{3, 3300} = 7.96$, $p < .0001$), with more dustbathing seen on shavings and straw. There was

also a significant substrate/age interaction ($F_{9, 3300} = 7.07$, $p < .0001$) with the most dustbathing seen on the shavings and the least on the Astro-turf both at aviary opening. Based on these results, different litter substrates promote varying levels of dustbathing. This information can be applied on a larger scale to commercial hen facilities promote improved hen welfare.

SERUM C-PEPTIDE AND SOLUBLE RECEPTOR FOR ADVANCED GLYCATION (SRAGE) PRODUCTS AND POLYP FORMATION
Diana Xu
Category: Agriculture and Animal Science, Section 3
Poster: 20
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Sarah Comstock (Food Science and Human Nutrition), Jenifer Fenton (Food Science and Human Nutrition)

In the body, insulin is responsible for regulating glucose metabolism by stimulating glucose uptake by cells. Dysregulated insulin signaling is thought to contribute to colon cancer risk. To determine if insulin-related serum factors are associated with colon polyps, 126 asymptomatic men (48 – 65 yr) were recruited at colonoscopy. Anthropometric measures and blood were collected. Odds ratios were determined using polytomous logistic regression for polyp number (0 or ≥3) and type (no polyp, hyperplastic polyp, tubular adenoma). Males with serum C-peptide concentration >3.3 ng/ml were 3.8 times more likely to have a tubular adenoma than those with C-peptide ≤1.8 ng/ml. As C-peptide tertile increased, an individual was 2 times more likely to have a tubular adenoma (p=0.01). Additionally, males with soluble receptor for advanced glycation end products (sRAGE) concentration >120.4 ng/ml were 0.25 times less likely to have ≥3 polyps compared to males with sRAGE ≤94.5 ng/ml. For each increase in sRAGE tertile, a man was 0.5 times less likely to have ≥3 polyps than no polyps (p=0.03). Serum concentrations of C-peptide and sRAGE may indicate which men could benefit most from colonoscopy and may potentially decrease colorectal cancer rates.

TESTING THE EFFECT OF REPRODUCTIVE STATE ON OLFACTION IN THREESPINE STICKLEBACK
Marquita Tillotson
Category: Agriculture and Animal Science, Section 3
Poster: 21
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jenny W Boughman (Zoology), Robert Mobley (Zoology), Emily G Weigel (Zoology)

Many research studies have established that pregnant (human) females have a heightened sense of smell. However, do other species display reproductive-state-dependent olfaction, too? Increased olfactory abilities would be particularly evolutionary beneficial for organisms that rely on odor cues during reproduction and mate choice. I will study how slight chemical changes can effect olfactory abilities in females. Threespine stickleback fish will be used from the freshwater lakes in British Columbia. Stickleback fish are known to heavily rely on odor cues during reproduction (Raffery and Boughman, 2006). The male stickleback fish emits a uniquely odorous glue to build a nest for offspring, and females assess males based on this odor and the male's phenotype. Research will focus on designing a mechanism to test both how female reproductive state and whether a known fish olfactory disruptant, humic acid (Fabian et al. 2007), affect olfaction in female stickleback fish. The trials will be conducted using a long, Y-shaped hard plastic piping, which will branch off into two separate ends. Female's preference will be tested by determining whether and how quickly a female swims to the end of the pipe containing the stimulus (food). Humic acid will then be added to the Y-maze to determine whether the acid inhibits or delays the female's abilities to detect the odor of food. As these tracked females become reproductive, I will repeat these two tests and look for differences in the side chosen and the speed of choice to establish if reproductive state influences olfaction.

DIPEPTIDYL PEPTIDASE-IV/CD26 ENZYME ACTIVITY IN HEALTHY AND EQUINE METABOLIC SYNDROME (EMS) EQUIDS
Lara Stephens-Brown
Category: Agriculture and Animal Science, Section 3
Poster: 22
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Raymond J. Geor (Large Animal Clinical Science), L. Jill McCutcheon (Pathobiology and Diagnostic Investigation), Patty Sue D. Weber (Large Animal Clinical Science)

Equine Metabolic Syndrome (EMS) is a metabolic condition characterized by increased adiposity, insulin resistance, hyperinsulinemia, and laminitis. The dipeptidyl peptidase--IV (DPP-IV) enzyme plays an important role in glucose metabolism in many species. Soluble DPP-IV circulates in the blood and its activity is higher in diabetic humans. Neither DPP-IV concentration nor enzyme activities have been studied in horses previously. The objective of this study was to (1) validate a commercial DPP-IV activity assay in equine serum and (2) compare DPP-IV activity in healthy control and EMS animals. Serum samples (collected after 8 hours of feed withholding ["fasting"]) from 114 Morgan horses and Welsh ponies (n=46 control, n=68 EMS) were used in this study. Assay protocols were adapted from the manufacturer's recommendations with emphasis on accurate dilution, inhibition, and assay read length. DPP-IV activity control intra-assay and inter-assay coefficients of variation (CV) were 0.8 and 7.1%, respectively, while a pooled equine serum control CVs were 3.6 and 15.1%. DPP-IV activity was higher in EMS equids (22.80 +1.43 RFU/min) than healthy controls (17.56 +1.28 RFU/min; P=0.0013). Significant Spearman correlations (P<0.05) were observed between DPP-IV activity and body condition score (r=0.340), and

fasting serum insulin (r=0.243), triglyceride (r=0.516), and non-esterified fatty acid (r=0.398) concentrations. Univariate analysis shows breed is strongly associated with DPP-IV activity. These results indicate that this assay may be used to determine DPP-IV activity in equids. The higher DPP-IV activity in EMS when compared to control equids suggests that DPP-IV may play an important role in glucose/insulin dynamics in EMS.

SEASONAL PATTERNS OF MALE STICKLEBACK (*GASTEROSTEUS* SPP.) COURTSHIP AND NESTING ACTIVITY
Marc Wingo
Category: Agriculture and Animal Science, Section 3
Poster: 23
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Emily Weigl (Zoology)

Reproduction often involves female choice and investment, two potential targets of sexual selection. As sexual and natural selection work to drive evolution, selection targets can impact populations particularly when there are competing considerations. Threespine stickleback (*Gasterosteus* spp) sticklebacks display *male* parental care, the evolutionary consequences of variable mate selection and reproductive investment of females are quite dependent on the reproductive activity and nesting behavior of males. The question my lab posed was how might the match, or lack thereof, of seasonal patterns between females and in male courtship activity and nesting shape the evolution of the species? We tracked individual male courtship behavior and nest building activity across the season. Because male entry into the study and nest completion was 'staggered', we were able to also examine the effects of 'practice' by comparing trial (mate) number and date in the breeding season. What we found was that the total amount of time a male spends nesting increases with increasing number of partners. However, the length of each nesting event doesn't change; the male simply increases the amount of times he visits his nest.

STUDY OF EQUINE GENE UGT1A1 IN ASSOCIATION WITH GILBERT'S SYNDROME
Ashley Foley
Category: Agriculture and Animal Science, Section 3
Poster: 24
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Susan Ewart (Large Animal Clinical Science)

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 specifically targets the bilirubin molecule, a byproduct of heme catabolism. When functional, bilirubin is conjugated 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. This is the study of a horse with characteristics of Gilbert's Syndrome. We hypothesized that mutation(s) in the UGT1A1 gene or its regulatory sequence will be found in this horse. METHODS: The UGT1A1 coding sequence containing five exons and 3kb 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 EquCab2 assembly, the complete equine genome. RESULTS: No differences were found between the affected horse and the EquCab2 assembly or between the affected and control horses for the coding sequence. Results of the regulatory sequence are pending. CONCLUSIONS: No mutations were identified in the coding sequence of UGT1A1. However, a causative variant may yet be found in the regulatory sequence. It is not conclusive yet if the mutation is located on the specified region for this project, elsewhere in the UGT1A1 gene, or in a different gene entirely.

BIOCHEMISTRY & MOLECULAR BIOLOGY

POSTER PRESENTATIONS, SECTION 1

BACTERIAL SECONDARY MESSENGERS AND THEIR INTERACTION WITH THE INNATE IMMUNE SYSTEM OF *ARABIDOPSIS THALIANA*
Char Panek
Category: Biochemistry and Molecular Biology, Section 1
Poster: 30
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Sheng-Yang He (Plant Research Laboratory)

The initial line of plant innate immunity relies on membrane proteins known as pattern recognition receptors to bind to pathogen or microbe-associated molecular patterns (MAMPs). Despite considerable effort, the scientific community has been striving to discover MAMPs and their respective pattern recognition receptors, but only a handful have been characterized in plants. Recent strides in microbiology research have brought to attention bacterial secondary messengers and their role in

microbial behavior. Cyclic di-guanosine monophosphate (c-di-GMP) and cyclic di-adenosine monophosphate (c-di-AMP) are dimeric secondary messengers, exclusive to bacteria. C-di-GMP is responsible for signaling virulence and motility in many bacteria, and c-di-AMP plays a role helping bacteria handle cell wall and osmotic stress. The innate immune system in mammals is capable of sensing cyclic dinucleotides. A transmembrane protein in humans called STING, or stimulator of interferon genes, has the ability to detect and bind to cyclic dinucleotides (Burdette et al., 2011). While plants lack STING, it is possible that plants have convergently evolved their own receptor to detect the secondary messengers of bacteria. An immune response to cyclic dinucleotides is testable through various disease assays, including a reactive oxygen species (ROS) burst assay and a callose deposition assay. Here, we use the aforementioned immune assays to characterize whether the model plant, *Arabidopsis thaliana*, can recognize and respond to bacterial second messengers. Furthermore, using the callose deposition assay, we will determine whether the plant can initiate an immune response to native *Arabidopsis*-associated microorganisms.

IDENTIFICATION AND CHARACTERIZATION OF GENES INVOLVED IN SCOPOLAMINE BIOSYNTHESIS IN *ATROPA BELLADONNA*
Joseph Uebler
Category: Biochemistry and Molecular Biology, Section 1
Poster: 31
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Cornelius Barry (Horticulture)

Alkaloids are an abundant and heterogeneous group of specialized metabolites, characterized by the presence of a basic nitrogen atom. 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. Hyoscyamine and scopolamine are synthesized in the roots and a deep transcriptome assembly of *A. belladonna* has been generated that includes three separate root libraries. This transcriptome assembly has been mined for genes preferentially expressed in roots that encode different classes of enzymes that are typically involved in plant specialized metabolism. Condensation of phenyllactic acid with tropine to form littorine, currently represents an unknown step in scopolamine biosynthesis that has been proposed to occur through the action of coenzyme A dependent BAHD type acyltransferases. An alternative acylation pathway also operates in plant specialized metabolism through the action of plant-specific serine carboxypeptidase-like (SCPL) acyltransferases that catalyze glucose esterdependent transacylations, which require UDP-glucosyltransferases (UGTs). Root-specific BAHDs, GTs, and SCPLs have been identified in the *A. belladonna* transcriptome. This research will utilize an established virus-induced gene silencing protocol, coupled with metabolite profiling to determine the possible involvement of Coenzyme A dependent and glucose ester dependent acylations of the tropine ring.

THE MECHANISM OF PHOTOPROTECTION IN PLANTS: INVOLVEMENT OF THERMALLY-ACTIVATED EXCITED STATES
Matthew Smith
Category: Biochemistry and Molecular Biology, Section 1
Poster: 32
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): David Kramer (Biochemistry and Molecular Biology)

In plants, overexposure to sunlight can reduce photosynthetic efficiency by creating harmful reactive oxygen species, including singlet oxygen and superoxide. Plants have adapted to protect themselves by dissipating excess excitation energy as heat; this process is known as non-photochemical quenching (NPQ). The mechanism of NPQ is under intense debate. Some models posit that NPQ involves exciton transfer to low-energy carotenoid energy levels, while others propose that de-excitation involves electron transfer. NPQ can be quantified by comparing the differing chlorophyll florescence yields in light and dark adapted plants after saturating normal photochemical quenching with light. However, these differences in fluorescence seem to disappear at liquid nitrogen temperatures, 77K. Based on this observation, we hypothesized that NPQ involves a thermally activated intermediate. If so, characterizing this intermediate may allow us to identify the thermodynamic mechanism of NPQ. We are testing this hypothesis by measuring the temperature-dependence of chlorophyll fluorescence emission spectra of wild type and mutant plants with altered NPQ responses. Preliminary work was performed in a temperature regulated cryogenic chamber; this apparatus was attached to a spectrofluorometer via a fiber optics light guide, with illumination from a filtered light emitting diode. Results show clear differences in fluorescence temperature-dependence between the light- and dark- adapted wild type and NPQ deficient mutants, consistent with the proposed thermally activated intermediate. Data is currently being collected via Time Correlated Single Photon Counter (TCSPC) with hopes of observing correlations between previous experiments and fluorescence decay kinetics in samples.

COMPUTATIONAL PREDICTION OF NOVEL INHIBITORS FOR MYROSINASE
Eric Boerman
Category: Biochemistry and Molecular Biology, Section 1
Poster: 33
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Leslie Kuhn (Biochemistry and Molecular Biology)

Myrosinase is an enzyme found in certain plant and microbe species that is a key component of the biosynthesis pathway of isothiocyanates - allelotoxins that suppress soil microbes that mutualistically benefit many plant species. This system is found in multiple economically-damaging invasive species in North America, such as Garlic Mustard (*Alliaria petiolata*), which is the focus of this study. Because the invading plants do not require symbiotic soil microbes, they gain a selectionary advantage over native species. The goal of this project is to find novel inhibitors for myrosinase which can hopefully be used to control the spread of garlic mustard and other species. This will be done by computational analysis of ligand binding in myrosinase's active site. The structure of myrosinase is well-documented, and by looking at the manner in which known ligands bind to the active site we hope to determine catalytically-active amino residues within myrosinase. Once the important features within the active site are known, a library of molecules similar in structure to known substrates and cofactors will be assessed for their ability to bind to myrosinase's active site. This will be done computationally so that the list of candidates can be quickly narrowed. Promising candidates will then be tested in vivo to determine their quality as inhibitors of myrosinase.

BIOCHEMICAL CHARACTERIZATION OF ALKBH1 VARIANTS FOCUSING ON PUTATIVE PROTEIN-DNA ADDUCT FORMING RESIDUES
Kristen Clark
Category: Biochemistry and Molecular Biology, Section 1
Poster: 34
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Robert Hausinger (Microbiology and Molecular Genetics), Tina Muller (Microbiology and Molecular Genetics)

Alkbh1 is a human homolog of the *Escherichia coli* AlkB protein that directs DNA repair by removing alkylation damage to DNA bases. While the in vivo role of Alkbh1 is still unknown, the protein was recently shown to possess abasic site lyase activity in vitro and to cleave abasic sites according to a beta-elimination mechanism. Surprisingly, Alkbh1 forms a covalent adduct to the 5'-DNA product. In this project, different Alkbh1 variants were characterized, focusing on residues that may form the protein-DNA adduct as well as several amino acids which are predicted to bind metal ions. Site-directed mutagenesis was used to make variant proteins which differ in one or more amino acids from the wild type protein, with expression in *E. coli* and purification by affinity chromatography. Assays were carried out to investigate whether adduct formation and AP lyase activity differed from the wild type enzyme. This approach has begun to provide us with additional knowledge about key amino acids in Alkbh1, with the hope of identifying residues critical to adduct formation. Thus far, a series of variants of putative zinc-finger residues and selected other potential amino acids involved in adduct formation were shown to not affect adduct formation.

PRODUCTION AND AGGREGATION STUDIES OF PHOSPHORYLATED TAU PROTEIN
Wei-Yu Liu
Category: Biochemistry and Molecular Biology, Section 1
Poster: 35
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Min-Hao Kuo (Biochemistry & Molecular Biology)

Tauopathies are a class of neurodegenerative diseases featured by intraneuronal deposits of abnormal phosphorylated tau protein. Though the association between phosphorylation of tau and the most well-known neurodegenerative disease, Alzheimer's disease, is not well-established, we only know the component for neurofibrillary tangles is hyperphosphorylated tau and the roles of phosphorylation in pathology and protein aggregation are still intriguing. One of the bottlenecks in the in vitro studies of tau aggregation is to obtain quantitatively phosphorylated tau (p-tau). To this end, we are developing the Zippers-Assisted Catalysis (ZAC) to produce efficiently p-tau. For now, we are processing ligation independent cloning (LIC) in order to insert kinase CDK5, protein folding chaperone FKBP and tau into ZAC vector.

CHARACTERIZATION OF LIPID-BINDING PARTNERS FOR TWO NOVEL LIPID-BINDING PROTEINS FROM *ARABIDOPSIS THALIANA*
Veronica Greve
Category: Biochemistry and Molecular Biology, Section 1
Poster: 36
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Susanne Hoffmann-Benning (Biochemistry & Molecular Biology)

Unlike animals, plants cannot escape adverse conditions. Hence, they need sophisticated systems to perceive, transmit and

respond to changes in the environment. The plant phloem is the system that transports metabolites and environmental signals throughout the plant. Our lab has found several lipids and novel lipid-binding proteins in the phloem. These lipids and proteins have intracellular signaling functions in other organisms; hence we hypothesize that they could play a role in long-distance environmental signaling and plant survival. I am investigating lipid binding and function of two of these phloem lipid-binding proteins, a GDSL lipase-like protein and a Phosphatidylinositol N-acetyglucosaminlytransferase subunit P-like protein (PIG-P). Using a competent strain of *Escherichia coli*, I have expressed the gene and isolated the pure protein to perform lipid assays. A membrane spotted with multiple lipids was incubated with the purified protein and indicated bindings of GDSL to Diacyl-glycerol (DAG) and a phosphatidylinositol (PIP-3). PIG-P had indicated bindings to phosphatidylserine (PS) and a PIP-4. DAG and PIP are known secondary signaling molecules which fit into our hypothesis. We are in the progress of using liposomes to verify GDSL and PIGP-binding to DAG and PIP/PS, respectively. In parallel, our lab is also researching how stress tolerance changes with over-expression and down-regulation of the GDSL and PIGP genes and how environmental stress regulates GDSL and PIG-P gene expression.

GLYCATION OF INSULIN RECEPTOR FRAGMENTS IN HYPERGLYCEMIC CONDITIONS AND EFFECT ON INSULIN BINDING
Tyler Rhinesmith
Category: Biochemistry and Molecular Biology, Section 1
Poster: 37
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Robert Root-Bernstein (Physiology)

Spontaneous glycation of insulin is known to occur at 20 mM glucose, a concentration seen in persons with hyperglycemia (Abdel-Wahab, et al. 1997). Such glycated insulin has been shown to have 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 hormone in sequence (Root-Bernstein et al. 2010). Here, we show covalent glycation of insulin-like fragments of the insulin receptor after incubation in 22 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 glycated insulin receptor fragments were also performed. Because the insulin receptor remains in cell membranes for months, it is a much better candidate for significant glycation over many hyperglycemic cycles in diabetics. Such structural alteration could have impacts on the receptor function. Therefore, we suggest that glycation of the insulin receptor may be a causative factor in the occurrence of insulin resistance in patients with hyperglycemia.

POSTER PRESENTATIONS, SECTION 2

ROLE OF CHROMATIN REMODELING IN THE JASMONATE-REGULATED DEFENSE RESPONSE OF *SOLANUM LYCOPERSICUM*
Hunter Piegols
Category: Biochemistry and Molecular Biology, Section 2
Poster: 38
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Monique Floer (Biochemistry and Molecular Biology)

Chromatin architecture has been shown to change dramatically in cells responding to environmental stimuli at specific genomic regulatory elements, and these changes can be directly correlated with inducible gene expression. Prior research has focused primarily on yeast and mammalian model systems; consequently, little is known about the interplay between chromatin structure and gene expression in plants. This study seeks to gain insight into how changes in chromatin structure may be involved in the jasmonate-regulated defense of the tomato *Solanum lycopersicum* in response to insect attack. To address this question, the leaves of *S. lycopersicum* are treated with methyl jasmonate (MeJA), simulating damage caused by insects. Chromatin is extracted from three sample types: unwounded leaves (control), leaves treated directly with MeJA (wounded), and leaves from a plant treated with MeJA that have not been directly exposed themselves (systemic). The extracted chromatin is then digested with a wide range of micrococcal nuclease concentrations, and quantitative PCR is employed to determine nucleosome occupancy and positioning at specific locations. This assay allows high-resolution analysis of any changes in chromatin structure that may occur at inducible wounding response genes. The results of this study may have important implications for the agricultural industry, as insects are one of the most common causes of crop death. It also represents the first high-resolution study of nucleosome occupancy and positioning of its type in plants. This presentation will discuss the results of the described research as well as provide a framework in which to interpret the results.

QUANTIFICATION OF SELECTED EICOSANOID METABOLITES IN URINARY BLADDERS OF HEALTHY CATS
Brenna Lashbrook
Category: Biochemistry and Molecular Biology, Section 2

Poster: 39
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): John Kruger (Small Animal Clinical Sciences)

Eicosanoids are potent lipid mediators involved in numerous physiologic and pathologic processes. Polyunsaturated fatty acids are metabolized through cyclooxygenase (COX) and lipoxygenase (LOX) pathways to produce prostaglandins (PG), thromboxanes (TX), leukotrienes (LT), lipoxins (LX), maresins, resolvins and protectins. Recent studies suggest that urinary bladder eicosanoid metabolism may be altered in cats with idiopathic (interstitial) cystitis. The purpose of this study was to describe eicosanoid metabolites in urinary bladder tissue of healthy cats to establish baseline profiles. Bladder tissues were collected from 8 male and 9 female healthy cats, aged 0.4 to 13 years, euthanized as part of unrelated studies. Only cats with a stable dietary history and normal urinalysis, urine culture, and bladder histopathology results were evaluated. Tissues were collected immediately after euthanasia and frozen in liquid nitrogen. Individual eicosanoids were quantified by liquid chromatography-mass spectroscopy (LC/MS). Mean tissue concentrations (pg metabolite/mg tissue) of pro-resolving/anti-inflammatory metabolites (range 0.33-131.61 pg/mg) tended to be substantially higher than pro-inflammatory (range 0.16-53.01 pg/mg) or intermediate/unknown (range 1.49-97.23 pg/mg) metabolites. Consistent differences in eicosanoid concentrations between bladder tissue microenvironments, males and females, and old and young cats were not evident. Both pro- and anti-inflammatory eicosanoids, and mediators associated with lipid peroxidation and oxidative stress were readily detected and quantified in urinary bladder tissues of healthy cats by LC/MS. This is the first report documenting expression of eicosanoids with known anti-inflammatory properties in feline bladder tissues.

ALLOSTERIC COMMUNICATION OF THE MUTS PROTEIN VIA PROTEIN NETWORKING ANALYSIS
Joshua Francis
Category: Biochemistry and Molecular Biology, Section 2
Poster: 40
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Michael Feig (Biochemistry and Molecular Biology)

When the integrity of the genome is compromised, mutations result leading to changes in normal phenotypes and ultimately cancer. DNA mismatch recognition and repair is the cellular process responsible for the prevention of genome inaccuracies. Conserved in both eukaryotes and prokaryotes, MutS is a multi-domain protein that identifies post-replication mismatches in DNA and signals repair initiation. The ATPase domain whose activity is critical for signaling to occur lies at the opposite end of the protein from the mismatch recognition site. Analysis of the allosteric communication between the mismatch binding domain and the ATPase site through protein networking analysis has revealed that the protein communicates via a multi-path web. This result suggests that allosteric changes in proteins are more complex in nature than a single allosteric pathway between two regions.

MEASURING BDNF PROTEIN IN SKELETAL MUSCLE OF MOUSE MODELS OF KENNEDY'S DISEASE
Jessica Mudge
Category: Biochemistry and Molecular Biology, Section 2
Poster: 41
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Marc Breedlove (Neuroscience), Cynthia Jordan (Neuroscience)

Kennedy's Disease is a rare androgen-dependent disorder causing muscular atrophy and weakness in affected males. Our lab has found that brain-derived neurotrophic factor (BDNF) mRNA is reduced in skeletal muscle of two different mouse models of this disease, which coincides with changes in motor function. We now want to ask whether a deficit in BNDF protein is also evident in diseased muscle. However, the low quantity of BDNF in muscle makes measurements of its abundance difficult and inconsistent. This study seeks to determine which method of sample preparation and assay is best to effectively measure such BDNF. We will compare the amount of BDNF yield using three different homogenization methods (by hand, sonicator, and rotor-stator), different ratios of muscle to homogenization buffer, different tissue types (we note that BDNF yield is much higher in non-fibrous tissue like brain compared to fibrous tissue like muscle), and finally, directly compare results from two routinely used commercially available Enzyme Linked Immunosorbent Assay (ELISA) kits. Once conditions are optimized, we will confirm that the protein assay kits work correctly for our specimens by replicating two previously reported findings: 1) that the slow twitch soleus muscle contains more BDNF than the fast twitch extensor digitorum longus muscle and 2) BDNF levels in muscle change in response to castration. Results from these studies will allow us to further examine the androgen-dependent relationship between BDNF protein levels and motor dysfunction in Kennedy's Disease.

EMS MUTANT SCREEN OF ARABIDOPSIS PRR7 MUTANTS
Tyler Messenger
Category: Biochemistry and Molecular Biology, Section 2
Poster: 42
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Eva Farre (Plant Biology)

The circadian clock is a natural oscillator in an organism that regulates certain actions with a period of about 24h. The clock is based only on time, and can be set and reset using light and temperature. The clock has been shown to regulate various genes and processes in the model plant *Arabidopsis thaliana*. One gene of *Arabidopsis* shown to be a part of the circadian clock is the PSEUDO-Response Regulator 7 (PRR7). This gene has been shown to be regulated based on the circadian clock. PRR7 mutants were screened that have already undergone mutagenesis of 35S:PRR7-luciferase expressing lines. Mutants with a high luminescence were identified after their circadian rhythm has been reset to match a 12 hour light/12 hour dark cycle. PRR7 proteins are degraded throughout the course of the night in wild type plants. In the mutants, the proteins will not be degraded, and the organisms will glow. The isolated mutants will be used to identify the regulators of PRR7.

DIRECTION SPECIFIC COMPUTATIONAL PROTEIN REFINEMENT VIA STEERED MOLECULAR DYNAMICS AND "FRANKENSTEIN" STRUCTURE ANALYSIS
Keenan Noyes
Category: Biochemistry and Molecular Biology, Section 2
Poster: 43
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Michael Feig (Biochemistry and Molecular Biology)

While there exists billions of known genetic sequences, just a small fraction of those sequences have determined protein structures. To aid in the structure determination of the remaining sequences, researchers have turned to computational methods to predict the structure. While methods of protein structure prediction continue to improve, there remains no protocol that consistently produces protein structures of experimental accuracy, vital for fields like pharmaceutical research. To improve upon these predicted structures, methods of protein structure refinement attempt to bring the predicted structure closer to the native state. However, there remains no consistently successful method of protein structure refinement. One of the issues that prevents consistent refinement is the presence of high energy barriers in the free energy landscape, which prevent the extensive sampling necessary to reach the native state. By using steered molecular dynamics (SMD) we have been able to provide a directed assist to particular regions of the protein backbone to force the structure over these energy barriers. Large percentages of refined structures were generated using SMD, indicative of a successful sampling method. From these generated refined structures, we have been able to synthesize "Frankenstein"-like protein structures using different refined regions from multiple simulations of the same target to produce overall structures further refined than any of the generated structures from the individual simulations. These findings suggest that both SMD and the generation of "Frankenstein"-like structures could be incorporated into a successful protein structure refinement protocol.

EFFECTS OF CELLULAR CROWDING ON ADENINE RIBOSWITCH RNA STRUCTURE
Caleb Arthur
Category: Biochemistry and Molecular Biology, Section 2
Poster: 44
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Michael Feig (Biochemistry and Molecular Biology)

Crowded environments encountered in cells are known to modulate biomolecule structure and dynamics. Previous studies have shown that macromolecular crowding has significant effects on stabilizing or destabilizing the states of biomolecules by volume exclusion effect and enthalpic contributions. Recently, the adenine riboswitch aptamer domain has been studied in *E. coli* cells and in vitro to examine the effect of cellular crowding on RNA structure. It has been shown that the aptamer structure in cell is more compact than in vitro. However, the cause of reactivity differences between different regions of structure remains elusive. In the current study, the same system is studied using molecular dynamics simulations under both, crowded cellular and dilute in vitro conditions. Explicit solvent molecular dynamics simulations were carried out using the CHARMM force field. Analysis results suggest that there is greater stability of the RNA within the cell, while favoring disorder in the absence of crowding.

POSTER PRESENTATIONS, SECTION 3

ARC6 WORKS AS A MEMBRANE-TETHERING AND ASSEMBLY REGULATOR PROTEIN FOR THE FTSZ RING IN PLASTID DIVISION
Christy Kinney
Category: Biochemistry and Molecular Biology, Section 3
Poster: 45
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Katherine Osteryoung (Plant Biology)

Chloroplast division is a dynamic process involving many proteins, forming a division complex. The FtsZ ring, a centralized inner-plastid structure that helps constrict the chloroplast, is thought to be anchored to the membrane by a protein called ARC6. ARC6 is thought to connect to the FtsZ2 filaments, providing stability for the ring. We utilize fission yeast *Schizosaccharomyces pombe* as an in vivo-like system of expression to examine the relationship of ARC6 and the FtsZ ring,

particularly whether the connection is with the FtsZ binding domain or if the connection also involves a part of the stromal region of ARC6. We also examine the roles of ARC6 and the purpose of its interaction with the FtsZ ring, such as whether ARC6 truly is a positive regulator of chloroplast and plastid assembly, and if, as in vivo data suggests for chloroplasts, ARC6 interacts directly with FtsZ2 in plastids, as well. We hypothesize that in *S.pombe* there will be no effect from co-expressed FtsZ1filaments and ARC6; however, we propose that there will be a positive effect when FtsZ2 is co-expressed with ARC6, resulting in a slower turnover rate of FtsZ2 filaments, therefore serving as a stabilizing factor for the FtsZ ring.

QUANTIFICATION OF RED BLOOD CELL UPTAKE OF THE SICKLE CELL DISEASE DRUG HYDROXYUREA USING GAS CHROMATOGRAPHY – MASS SPECTROMETRY
Stephen McNamara
Category: Biochemistry and Molecular Biology, Section 3
Poster: 46
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Jayda Erkal (Chemistry), Dana Spence (Chemistry)

Hydroxyurea (HU) is the only FDA approved drug used in the treatment of sickle cell disease, which is an autosomal recessive disorder characterized by the production of a mutated form of hemoglobin in the red blood cell (RBC). Upon loss of oxygen, this mutated form of hemoglobin, termed sickle hemoglobin (HbS), will begin to polymerize and can cause the RBC to take on a sickle shape. It is currently thought that HU acts by increasing the production of fetal hemoglobin (HbF), which has a higher affinity to oxygen compared to HbS and can increase the polymerization lag time of HbS inside the RBC. However, the increase in HbF levels in sickle cell patients taking HU is only observed 4-6 weeks after patients begin treatment with the drug. The HbF observations cannot explain the more immediate effects of HU treatment, such as reduction in frequency of sickling crises and improvement in vascular tone. In order to investigate the hypothesis that HU acts directly on the RBC, an uptake study was designed to quantify the amount of HU that interacts with the RBC. Standards were prepared by extracting HU with ethyl acetate from HU standards (0-100 uM) in Hank's Balanced Salt Solution (HBSS). The extracted HU was subsequently silylated with (N,O-bis(trimethylsilyl) trifluoroacetamide + trimethylchlorosilane (BSTFA+TMCS) and was analyzed using gas chromoatography mass spectrometry (GC-MS). The resulting calibration curve was used to quantify extracted and derivatized HU in the supernatant from 7% RBC samples incubated with 100 uM HU.

ELUCIDATE THE ROLE OF THE INSTABILITY ELEMENT OF RB PROTEINS IN DETERMINATION OF CELL FATE.
Julianne Streukens
Category: Biochemistry and Molecular Biology, Section 3
Poster: 47
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): R William Henry (Biochemistry and Molecular Biology), Stacy Hovde (Biochemistry and Molecular Biology)

The Retinoblastoma (RB) tumor suppressor protein regulates both cell cycle progression and programmed cell death, as key mechanisms for tumor suppression. However, how RB governs these distinct pathways that enact mutually exclusive cell fates, remains a critical question in cancer biology. We propose the hypothesis that specific protein contacts involving an instability element (IE) located within the RB-C terminal domain, allows it to perform multiple tasks within the cell because this region can discern target genes involved in these distinct cellular processes. In particular, RB is directly involved in repression of the cell cycle by binding to the transcriptional activator E2F/DP complex, and repressing transcription of genes critical to cell cycle progression and cell division. We hypothesize that the IE plays a critical role in this association with the E2F/DP complex. In my project, we will explore the IE region of all RB family members for their role in gene-specific regulation, by testing each IE for distinct function in protein-protein interactions with E2F/DP complexes. To accomplish this goal, I will generate a dual SUMO + His tagged version of all RB proteins and study their binding to purified marked box (MB) domains from E2F1/DP and E2F4/DP complex. Together, these experiments will help us discern the mechanisms underlying IE mediated gene repression and provide us molecular details on how RB dictates unique cell fate choices during tumor suppression.

SYNTHESIS OF NOVEL COMPOUNDS IN PREBIOTIC CONDITIONS
Andrew Baker, Tyler Rhinesmith
Category: Biochemistry and Molecular Biology, Section 3
Poster: 48
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Robert Root-Bernstein (Physiology)

In 1953 Stanley Miller first demonstrated that an apparatus simulating primordial earth conditions could synthesize important biomolecules (Bada 2013). A multitude of similar experiments have followed, many of which involved changing the gases used in the apparatus from reducing to non-reducing, or applying different energy sources such as UV light or extreme heat (>700°C) (Fitz. et al 2007). Most of these changes have produced amino acids, simple organic molecules and in some cases simple sugars and nucleic acids (Fitz. et al 2007). However, in order to gain new insights, we manipulated the salt content of the starting solution, something that has only partially been investigated (Bada 2013). In addition to this, the shape of the

apparatus was also changed, another factor that we think has barely been investigated. Preliminary results have shown synthesis of simple sugars and unidentified volatile compounds in addition to the expected amino acids. These biomolecules were identified by qualitative tests such as paper chromatography and quantitative analyses such as GC-MS. Further quantitative testing is needed to identify the volatile compounds. In future studies we hope to optimize the apparatus to produce a wider breadth of biological precursors, including fatty acids, peptide chains, and polysaccharides.

CIS-REGULATORY ANALYSIS OF THE INSULIN RECEPTOR GENE IN *DROSOPHILA MELANOGASTER*
Ashley Menning
Category: Biochemistry and Molecular Biology, Section 3
Poster: 49
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): David Arnosti (Biochemistry and Molecular biology), Rewatee Gokhale (Biochemistry and Molecular biology)

The Insulin Receptor (InR) is a transmembrane receptor that enables nutritient-dependent growth and development. InR expression has been found to be irregular in diseases such as type II diabetes and cancer. An understanding of the transcriptional regulation and expression patterns of Inr in response to different transcription factors can lead to better understanding of how expression is changed in a diseased state. The goal of this project, therefore is to gain a better understanding of the transcriptional regulation of Inr. We study this problem using the common fruit fly, *Drosophila melanogaster*. The *Drosophila* Insulin Receptor (dInR) is homologous to human InR. Therefore, an understanding of the transcriptional regulation of this gene in *Drosophila*, could lead to a better understanding Inr expression in humans. In order to study this pathway in *Drosophila*, we made use of the UAS-Gal4 binary expression system. We used Gal4 lines in which Gal4 expression was driven by upstream regulatory regions of Inr. These lines were crossed to a UAS-GFP reporter line. This system therefore allows analysis of the expression patterns of Inr in vivo, by analyzing patterns of GFP expression. Expression patterns were analyzed in third instar larvae and adult flies. Our preliminary results from larvae indicate that Inr has a very distinct tissue specific expression pattern, with different cis-regulatory regions controlling expression in different tissues. Our further studies will be focused on tracking expression from an early developmental stage to adult flies, i.e. from embryos to adults.

COMPARISON OF ATP AND NO RELEASE FROM HUMAN RED BLOOD CELLS STORED UNDER HYPER- AND NORMOGLYCEMIC CONDITIONS
Eric Walton
Category: Biochemistry and Molecular Biology, Section 3
Poster: 50
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Jayda Erkal (Chemistry), Dana Spence (Chemistry)

The current additive solution (AS-1) used for red blood cell (RBC) storage in the United States contains 111.1 mM glucose. Considering that the glucose level in a healthy human is around 5.5 mM, the current storage solution holds RBCs in a hyperglycemic state. This excess glucose is thought to contribute to the RBC storage lesion, which is characterized in part by a decrease in deformation-induced RBC adenosine triphosphate (ATP) release. RBC-derived ATP as well as nitric oxide (NO) are two metabolites that are released in response to hypoxia, or lowered oxygen tension, and they are hypothesized to participate in vasodilation. RBCs were stored in hyperglycemic (AS-1) and normoglycemic conditions (AS-1N) for 30 days. AS-1N samples were fed with glucose every 3 days to maintain a glucose level of 5.5 mM in the storage bags. Glucose concentration during the storage was measured using the Trinder reaction, a colorimetric method where glucose is oxidized to produce a red quinoneimine dye (510 nm). To monitor the percent hemolysis in stored samples, total and supernatant hemoglobin concentrations were measured using Drabkin's reagent, a solution that oxidizes hemoglobin to cyanmethemoglobin (542 nm). Measured hemolysis in both storage conditions were <1% for both conditions. ATP and NO release from standards and hypoxic 7% stored RBC samples were measured using the luciferin-luciferase assay and the extracellular probe 4-amino-5-methylamino-2', 7'-difluorescein (DAF-FM).

EXPRESSING CYTOCHROMES FOR PHOTOSYNTHETIC ENERGY TRANSDUCTION
Thomas Hyland
Category: Biochemistry and Molecular Biology, Section 3
Poster: 51
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): David Kramer (Plant Biology), Eliezer Schwarz (Plant Biology)

Light harvested by a leaf cannot be fully utilized by photosynthesis. Instead, up to 90% of the light absorbed is dissipated as heat through non-photochemical quenching. This is problematic inasmuch as a potential energy resource is wasted. To optimize the efficiency of photosynthesis, we are pursuing the feasibility of alternative energy transduction pathways that can function in the electron transport chain following photosystem one. *Shewanella oneidensis* is capable of anaerobic respiration using a multitude of different terminal electron acceptors. This capability is possible due to a plethora of cytochromes found in the *Shewanella* genome, amongst which are flavo-cytochromes. These flavo-cytochromes have not yet

been characterized and are potentially interesting for accepting electrons from photosynthesis and converting them into electric potential outside the membrane. In this portion of the project, we will be expressing and purifying these flavo-cytochromes in hopes that they will serve as electron transducants, and ultimately aid in photosynthetic optimization.

CHARACTERIZATION OF THE GLYCATED HEMOGLOBIN HBA1C BY CYCLIC VOLTAMMETRY
Mark Schonfeld
Category: Biochemistry and Molecular Biology, Section 3
Poster: 52
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

Our research focuses on detection methods for the glycated Hemoglobin (HbA1c). HbA1c is a hemoglobin protein with a covalently bonded glucose. HbA1c is used as a biomarker for blood sugar regulation of diabetics and can also be used for diagnosis of diabetes. HbA1c levels in the blood will show periods of poor blood sugar regulation because once formed, the hemoglobin will not lose the bound sugar until the blood cell dies and is replaced. Therefore, measurement of high HbA1c levels will indicate poor regulation that occurred within a three month period. Current detection methods for HbA1c include electrophoresis/electroendosmosis, ion exchange chromatography, high-performance liquid chromatography, and various other biochemical procedures. The methods are complex, time consuming, and require expensive equipment and training. We are exploring the use of cyclic voltammetry for biosensing to analyze the potential difference between normal and HbA1c hemoglobin. An electrochemical difference between the two can be used to detect the HbA1c. A biosensor for the HbA1c would allow home monitoring of blood glucose that is representative of several months rather than multi-daily measurements. This would allow for easier diagnosis and monitoring of diabetes. If high levels of HbA1c are detected, then closer monitoring of blood glucose can be used to prevent complications from diabetes. In the long-term, this biosensor could provide a cheap, fast, simple and efficient alternative for HbA1c monitoring in diabetic patients.

BUSINESS

POSTER PRESENTATIONS, SECTION 1

ANALYSIS OF RESTAURANT INSPECTION REPORTS IN INGHAM COUNTY
Allison Kubek, Ariel Lessens
Category: Business, Section 1
Poster: 55
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): JaeMin Cha (Hospitality Business), Seung Hyun Kim (Hospitality Business)

Restaurants in the United States are regularly inspected by local health departments. Restaurant inspection is one of the most important ways to ensure food hygiene and safety practices in dining establishments. While inspection results are open to the public online, little data exists regarding the impact of restaurant inspection results on consumers' feelings and behaviors. Using 200 responses, the main purpose of this study is to evaluate the effect of perceived restaurant inspection results on individuals' attitudinal and behavioral outcomes. The changes in individuals' general attitudes after reviewing inspection comments are explored. An examination of factors that influence consumers' word-of mouth intention (whether or not they would tell others about the information they've found from inspection results) also takes place. This study additionally explores individuals' future intention to utilize the restaurant inspection system.

DEVELOPMENT OF A UNITED STATES TOURISM COMPETITIVENESS INDEX
Abbey Neerken
Category: Business, Section 1
Poster: 57
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Sarah Nicholls (Community Sustainability)

Tourism is one of the largest industries in Michigan generating $18.1 billion in direct spending and supporting more than 200,000 jobs in 2012. To support implementation of the recently developed 2012-2017 Michigan Tourism Strategic Plan, the tourism industry desires the ability to assess its competitiveness as a tourism destination relative to the other US states. Therefore, the objective of this project was to develop a US Tourism Competitiveness Index, to allow on-going assessment of Michigan's tourism competitiveness. The index is based on a series of objective variables representing a wide range of factors that influence tourism attractiveness and tourist satisfaction, thereby allowing unbiased comparison between the states and their tourism resources and amenities. Incorporated factors relate to transportation options (e.g., number of public airports), prices (state sale tax, average gas prices, etc.), and natural and cultural attractions (numbers of national and state parks, miles of trails, etc.). Given tourism's importance to Michigan's economy, and the exceptional experience promised by the award winning Pure Michigan campaign, it is critical that visitors' expectations are met, or better yet, exceeded when they

visit Michigan. Comparing variables included in this index will help Michigan identify areas of relative weakness and develop a stronger, more sustainable travel and tourism industry capable of contributing even more effectively to the state's continued economic growth and development.

HOW EXECUTIVE COMPENSATION AFFECTS COMPANY PERFORMANCE
Kyle Brown
Category: Business, Section 1
Poster: 58
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Greg Sabin (Finance)

For my undergraduate research, I am developing a database of compensation information for executives of publicly traded U.S. companies. I will be analyzing the data to uncover if there is any correlation between executive compensation and company performance. I will be using individual stock performance as a measure of company performance. This research is important because it can be used as a guide for how to effectively utilize executive compensation to improve a company's performance. I am hoping to uncover certain correlations between types of compensation (salary, bonus, stock awards, options, etc.), levels of compensation, and subsequent performance of that individual company's stock. These patterns can then be used to determine how much and which type of compensation is most effective in motivating executives.

EXPLORING MSU FOOD TRUCK'S BUSINESS STRATEGIES AND CUSTOMER SERVICE
Courtney March, Jiyeun Kim
Category: Business, Section 1
Poster: 59
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Mi Ran Kim (The School of Hospitality Business)

Food Trucks have begun to take a front row seat in the world of American street food as part of an ongoing food revolution (Myrick, 2012). Food Trucks, popularly described as "mobile food vending", generate about $650 million in revenue annually, and have been projected to quadruple their revenue stream over the next five years, to about $2.7 billion in revenue (Manning, 2013). Currently there is an increased demand for college-run food trucks and about 100 campuses now have their own Food Trucks. Michigan State University has been one of the first to begin this revolution, opening their Eat at State Food Truck in the fall of 2012. Food Trucks are not involved in the same service industry as regular restaurants, but operate in new ways. Food Trucks have their own business practices and SWOTs. Michigan State's Eat at State Food Truck has a significant amount of potential for growth and students have expressed interest in seeing more from their campus's Food Truck. Michigan State's Eat at State Food Truck seeks exceptional service, financial well-being, and differentiates themselves from the dining halls. They must ask themselves how they will deliver exceptional service, maximize their financial well-being, and discover what customers are looking for. The objectives for this project are: 1) Discovering Food Truck growth within the industry. 2) Discovering MSU's Food Truck business strategies and customer service. 3) How MSU's Food Truck is taking a leading role in the food industry.

STOCK PORTFOLIO DIVERSIFICATION: RISK-AVERSE VS. RISK-SEEKING INVESTORS
Karlie Zuchowski, Joseph Burzych, James Carlstedt, Jiaqi Li, Evan Wiewiora
Category: Business, Section 1
Poster: 60
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Kirt Butler (Finance), Antoinette Tessmer (Finance)

Knowing how to invest money is an important part in building wealth. Whether saving for a child's education, your retirement, or a family's dream vacation, earning a return on investment is crucial. But how risky of an investment will someone be willing to make? Using a theoretical $1,000,000 cash to invest in securities through StockTrak.com, we were given the opportunity to test the profitability of higher risk and lower risk investments. The objective was to display and test the theory that higher risk securities yield higher returns, while those of lower risk yield lower returns. The first question was, do people who consider themselves to be risk-lovers even take on more risk when investing? This was the easy part. Many financial measurements have been created specifically to measure risk in a portfolio. Once we found out if risk-lovers create riskier portfolios, we tested whether those additional risks paid additional gains. Combining ratios and formulas that we tracked throughout the year, we found answers to our questions. In finance, there are two types of people: those who love risk, and those who don't. Which one are you?

FINANCIAL LITERACY
Michael Booth, Nathan Quattrochi
Category: Business, Section 1
Poster: 61
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Craig Stilwell (Finance)

The presentation will consist of an examination of the financial literacy survey we created, an anaylysis of our findings, and discuss the application of our findings.

POSTER PRESENTATIONS, SECTION 2

HAND WASHING TRENDS
Rodney Weng, Spencer Raymond, Joshua Roberts
Category: Business, Section 2
Poster: 65
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Carl Borchgrevink (Hospitality Business), Jaemin Cha (Hospitality Business), Seung Hyun Kim (Hospitality Business)

Many people do not wash their hands when the behavior in which they engage would warrant it. Most research of hand washing practices to date has taken place in high-traffic environments such as airports and public attraction venues. Our team focused on taking observational data taken from places primarily from food service areas such as restaurants, bars, and food court bathrooms. These studies have established a persistent shortcoming and a gender difference in hand washing compliance. Using field observations of people, our research extends from earlier work from our mentors while identifying potential environmental and demographic predictors of hand washing compliance. Additionally, our research suggests that proper hand washing practices, as recommended by the Centers for Disease Control and Prevention, are not being practiced. The results can help increase hand washing rates for the general public and thus decrease the risk of transmitting disease.

STOCK PORTFOLIO RISK DIVERSIFICATION: BUY & HOLD INVESTORS VS. DAY TRADERS
Allison Bengel, Sa Li, Liam McFall, Alex Pouba
Category: Business, Section 2
Poster: 66
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Kirt Butler (Finance), Antoinette Tessmer (Finance)

Portfolio diversification, the main topic of our seminar, involves the practice of spreading investments over various types of companies, industries, or countries in order to minimize the risk involved. To analyze this risk, we used tools such as the Sharpe ratio and beta risk. We individually invested one million dollars and were free to invest in the companies of our choosing. We managed our portfolios based on the separate philosophies of active trading or buying and holding. The purpose of this project was to compare how successful the diversification was between these two methods. This research is important and useful because it demonstrates the most efficient philosophy for the risk adverse investor to follow. We plan to choose a number of portfolios based upon their frequency of trading. Portfolios with the highest frequency of trading per month will be directly compared with portfolios that experienced the lowest frequency of trades. These will also be compared against three portfolios that have not experienced any trading since the beginning of our research period. We hope to discover that there is no diversification advantage to trading at a high rate over buying and holding stocks.

THE EFFECTS OF DIFFERENTIATION AND COST STRATEGIES ON PROFITABILITY AND CUSTOMER SATISFACTION WITHIN HEALTHCARE
Kaitlyn Hanlon, Adam Curry, Michaela Marks
Category: Business, Section 2
Poster: 67
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Anand Nair (Supply Chain Manangement)

Through UGS 200H, an honors research seminar available for freshman and sophomores at MSU, we learned about many different topics and issues within the healthcare system today. The ways that various hospitals choose to differentiate themselves from other hospitals around them, and the outcomes of these strategies, became of particular interest to our group. This topic is of particular importance because there hasn't been much research done on hospital differentiation strategies, yet the findings could potentially help hospitals decide how to best invest their funds to compete with surrounding hospitals. In our research, we focus on how three types of differentiation strategies (providing a variety of related services, investing in technology, and having a skilled labor force through training) will impact hospital performance, as well as how a cost-based strategy, aimed at cutting down on hospital costs, will impact performance. Hospital performance is measured in terms of patient satisfaction and hospital profitability. We have eight different hypotheses, which we will test with the data collected using a survey to many hospitals. After the survey results are returned to us, we will conduct statistical analyses on the data to gain insight on the relationships between our variables. In our presentation, we will explain in detail our hypotheses, our developed reasoning behind each, and how the results of the survey proved or disproved the hypothesis.

UNDERSTANDING CUSTOMER'S EMOTIONS IN THE HOSPITALITY BUSINESS SETTING
Sungmin Choi
Category: Business, Section 2
Poster: 68
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Mi Ran Kim (The School of Hospitality Business)

Customer satisfaction is one of the key factors related to a company's future profit by increasing customer loyalty as a core concept of marketing (Anderson, Fornell, & Mazvancheryls, 2004; Homburg, Koschate, & Hoyer, 2005). According to the expectation-disconfirmation theory (Oliver, 1981), customer satisfaction is believed to result from a process of a customer comparing between his/her expectations and perceptions of performance; the confirmation or disconfirmation of those expectations then predicts satisfaction. Along with customer satisfaction, customer emotion has been regarded as a principal element in understanding perceptions of service experiences. Since emotion constitutes a primary source of human motivation and exerts substantial influence on the thought processes, a positive emotion is likely to lead to a positive reaction (Lin & Liang, 2011). Customers experiencing more positive emotions during service encounters will also be more likely to visit again, spread positive word-of-mouth, and building loyalty (Lin & Liang, 2011). The purpose of this study is to understand and identify customers' emotions about the products/services experiences while they were staying at a hotel. Specifically, this study focuses on the emotions or feelings when the customers were extremely satisfied and extremely dissatisfied about their hotel experiences. The sample for his study is the hotel industry and approximately, 1,000 hotel customers' emotional experiences during their hotel stay were analyzed. The findings have implications for both the hotel industry and the service industry, in general.

ENTREPRENEURIAL FINANCE
Machlin Fink, David Golembiewski
Category: Business, Section 2
Poster: 69
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Xing Huang (Finance), John Jiang (Accounting)

Research to determine the financial as well as psychological factors of entrepreneurial finance. Data pulled from a variety of industries and people who are working to start or expand their businesses.

VOLUNTEER IMPACT IN THE EMERGENCY DEPARTMENT
Emmalee Skorich, Sarah Tresedder
Category: Business, Section 2
Poster: 70
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Anand Nair (Supply Chain Management)

Patient care satisfaction is affected by a multitude of factors. The role of doctors and nurses in a patient's hospital stay has been well documented. However, the role of volunteers in patient satisfaction has been overlooked. Volunteers have been present in many units across hospitals for decades in order to improve quality of care and to reduce cost. Volunteers offer a variety of patient comfort measures and increase interaction time between the patient and staff members. Often, volunteers act as a liaison between the hospital and the patient. It is important to analyze the volunteers' role to determine the extent of the impact on the patient's overall satisfaction. As a matter of fact, several hospitals use professional administrators to ensure that volunteers are used efficiently. This study aims to extend the current understanding of the role of volunteers in hospitals by means of an extensive review of literature and by using insights gained from first-hand volunteering experience in a hospital. Specifically, we extend the literature by developing theoretical propositions regarding the impact of the number of volunteers and the role played by volunteers on patient satisfaction. The study further examines the time lag for the impact of volunteers to manifest and whether the impact is experienced similarly across various clinical units of a hospital. The theoretical propositions will be presented in the form of an integrated conceptual model.

EMPLOYEE DELIGHT IN THE HOSPITALITY BUSINESS
Jiyeun Kim
Category: Business, Section 2
Poster: 71
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Mi Ran Kim (The School of Hospitality Business)

Employees' emotion in the workplace has been considered as one of the key factors in managing and developing successful business (Ashkanasy & Daus, 2002; Ashkanasy, Hartel, Zerbe, 2000). Understanding employees' emotion is becoming critical issues for managers because employees' emotional states can significantly affect their attitude formation and behavior in an organization (Ashkanasy & Daus, 2002). When employees have positive emotions, they are more likely to have higher levels

of job satisfaction (Karatepe, 2011; Yavas, Karatepe, & Babakus, 2013). In particular, positive emotional experiences, like being excited and delighted, are related to higher job satisfaction, while negative emotional experiences, like being upset and nervous, are associated with lower job satisfaction. Therefore, the primary objective of this study is twofold: (1) to examine the employees' delightful incidents provided by their companies, and (2) to explore employees' emotions when the unexpected delightful incidents were provided by their companies. Through this research, about 144 incidents were collected from hotel employees to answer the following open-ended questions: 1) What are unexpected care, support, reward, promotion, and bonus that you have received from the current company? 2) What are your emotions or feelings about the unexpected care, support, reward, promotion, and bonus that you have received from the current company? Implications and suggestions will be discussed as part of this study.

CELL BIOLOGY, GENETICS & GENOMICS

ORAL PRESENTATIONS, SECTION 1

MIXED LINEAGE KINASE SIGNALING IS REQUIRED FOR THE SELF-RENEWAL OF GLIOBLASTOMA STEM CELLS
Sean Misek
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 11:00 AM-11:15 AM
Mentor(s): Kathleen Gallo (Physiology)

Glioblastoma is the most common and deadly form of brain tumor, with a post-diagnosis survival time of about one year. The current standard of care, which includes surgery, radiation, and chemotherapy only extends survival time by about three months. This poor prognosis is in part due to the inherent resistance of glioblastoma tumors to radiation treatment and chemotherapy. Thus, identifying the mechanisms that control the resistance of glioblastoma cells to radiation and chemotherapy is important for developing effective therapeutic strategies. Recent evidence suggests that this resistance is largely due to a specific type of cancer cell within the tumor, called the "cancer stem cell". The main goal of the work presented here is to identify the protein kinase signaling pathways that control the self-renewal of glioblastoma stem cells, and the resistance of glioblastoma cells to the DNA-alkylating drug Temozolomide, which is the standard of care in almost all glioblastoma patients. Our data suggest that the Mixed Lineage Kinase family of proteins is important for both of these aspects, and that the use of an MLK inhibitor may be a viable therapeutic strategy for treating glioblastoma tumors.

ASSESSING GENOME-WIDE EFFECTS OF THE TUMOR SUPPRESSORS RBF1 AND RBF2 IN *DROSOPHILA MELANOGASTER*
Irina Pushel
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 11:15 AM-11:30 AM
Mentor(s): David Arnosti (Biochemistry and Molecular Biology)

The retinoblastoma protein (Rb) was first identified as a tumor suppressor, and is frequently mutated in a broad range of human cancers. In healthy cells, Rb is a crucial cell cycle regulator, pausing the G1 to S phase transition. Mutations of Rb in cancer cells prevent this pausing and allow the cells to proliferate unchecked. An understanding of the function of this family of proteins will allow for better identification and treatment of diseases caused by such mutations. Using *Drosophila melanogaster* as a model system, we study Rbf1 and Rbf2, *Drosophila* homologs to Rb, to assess how mutations influence protein stability and repression activity. Previous work in the Arnosti lab has led to the development of a model of regulation of Rbf1 activity by phosphorylation. The aim of this project is to now develop an understanding of the direct molecular effects of Rbf1 mutations that represent the types of lesions in Rb proteins that are found in human cancers. I will first assess the general phenotypic effects of Rbf1 and Rbf2 overexpression on adult flies, and then, because the proteins work as transcriptional repressors, I will isolate chromatin from embryos and adult flies. Using chromatin immunoprecipitation, NextGen sequencing and whole-genome bioinformatic analysis, I will compare the chromatin state of flies with wild type and mutant Rbf1 and Rbf2. I will also be evaluating the effects of these constructs on gene expression to identify genes that are affected by Rbf1 mutations.

IRF6 AND RECEPTOR TYROSINE KINASE SIGNALING INTERACT IN CRANIOFACIAL DEVELOPMENT
Raeuf Roushangar
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 11:30 AM-11:45 AM
Mentor(s): Brian Schutte (Microbiology and Molecular Genetics)

Mutations in Interferon Regulatory Factor 6 (Irf6) lead to Van der Woude Syndrome and Popliteal Pterygium Syndrome, dominantly inherited orofacial clefting. Irf6 knockout mice (Irf6gt/gt) have severe bilateral oral adhesion and a cleft palate. In addition, variants within the Irf6 locus contribute at least 12% of all isolated orofacial clefting risk. Likewise, variants within Receptor Tyrosine Kinase (RTK) signaling pathway contribute additional risk for isolated orofacial clefting. In the mouse, like Irf6, perturbation of FGF signaling leads to oral adhesions and palatal clefting. In this study, we ask if Irf6 genetically interacts

with RTK signaling. To answer this question, we over-express Spry4 in oral epithelium using the KRT14 promoter (TgKRT14::Spry4). Considering that Spry4 represses RTK signaling, we predict that over-expressing Spry4 will lead to oral adhesions. To examine our predication, we use a mouse model and hypothesize that Irf6gt/+;TgKRT14::Spry4 embryos will have more severe oral adhesions than either TgKRT14::Spry4 and Irf6gt/+ littermates. Our analysis quantitatively shows that whereas Irf6gt/+ embryos develop mandible-maxilla oral adhesions, TgKRT14::Sprouty4 develop palate-tongue oral adhesions. Furthermore, Irf6gt/+;TgKRT14::Spry4 embryos have more severe mandible-maxilla and palate-tongue oral adhesions than either singly mutant embryo. Molecularly, we show that Irf6gt/+ and TgKRT14::Spry4 effect a common molecular signature for periderm. Significantly, Irf6gt/+ and TgKRT14::Spry4 interact in regulating Grhl3, a recently discovered human orofacial clefting gene. Together, these data suggest that Irf6 and RTK signaling regulate periderm development in the mouse and contribute significant risk to orofacial clefting in humans.

METAGENOMICS ANALYSIS OF A ~3-BILLION-READ TRANSCRIPTIONAL DATA SET FROM A WILD APPLE SPECIES
Cordarius Rodgers
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 11:45 AM-12:00 PM
Mentor(s): Steve Van Nocker (Horticulture)

Metagenomics is an emerging field of the study of genetic material recovered directly from heterogeneous biological samples. It is most commonly used to identify various individual species within mixed microbial communities, through selective amplification and sequencing of targeted index genes. Recently, approaches have expanded to analyses of macrobiotic communities, including the use of massively parallel sequencing of recovered DNA and comparison of DNA sequence with those of known organisms cataloged in databases. The goal of this study was to develop approaches for high-throughput analysis of species composition from environmental transcriptional (RNA-based) data, and then apply these to analyze a large existing collection of RNA-based data sets. We found that a strategy combining the sequence homology-search programs BLASTX and BLASTN was most efficient for identifying unknown sequence. We analyzed a collection of transcriptional datasets containing nearly 3 billion sequence reads and 300 billion nucleotides derived from 72 organs and developmental stages of a wild apple species, *Malus fusca*. Approximately 20% of reads showed high sequence similarity with previously identified genes from *Malus*. Approximately 50% of reads showed homology with genes from other plants and may represent previously undiscovered apple genes. Of the remainder, ~ 1% could be confidently classified as originating from a collection of macro and microorganisms. These results demonstrate the utility of an RNA-based approach for metagenomics and gene discovery.

BREAST CANCER AND THE AP-1 COMPLEX
Michael Rozwadowski
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 12:00 PM-12:15 PM
Mentor(s): Michele Fluck (Genetics)

Breast cancer is a deadly disease that claims thousands of lives each year. Tumors caused by breast cancer often become metastatic due to changes in gene expression. AP-1 is a transcription factor shown to induce the production of several proteins that contribute to aggressive metastasis in some breast cancer cells. It is a heterodimeric protein consisting of one unit of the fos protein family and one of the jun protein family. AP-1 has also been shown to have a large role in cell cycle regulation in all cells. This research examines the levels of proteins in the AP-1 complex that accompany the induction of metastasis. Tests are carried out at different points in the cell cycle. Several different metastatic cancerous, non-metastatic cancerous, and healthy human breast tissue cells are examined. Specifically, the fos-like protein Fra-1 is closely examined.

THE ROLE OF RECEPTOR INTERACTING PROTEIN 2 (RIP2) IN HYPERGLYCEMIA-INDUCED CASPASE-1 ACTIVATION IN MüLLER CELLS
Brandon Coughlin
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 12:15 PM-12:30 PM
Mentor(s): Susanne Mohr (Physiology)

Receptor interacting protein 2 (RIP2) is a multi-domain protein that plays a role in the activation of caspase-1. Once activated, caspase-1 leads to increased production of the pro-inflammatory cytokine interleukin-1beta (IL-1β). Recent studies have demonstrated that activation of the caspase-1/IL-1β signaling pathway is crucial for the development of diabetic retinopathy, a major complication of diabetes leading to blindness. Retinal Müller cells seem to be a potent source for active caspase-1 under hyperglycemic conditions. How elevated glucose levels promote caspase-1 activation is unknown to date. Therefore, this project tested the potential role of RIP 2 in hyperglycemia-induced caspase-1 activation in Müller cells. Human Müller cells were treated with media containing either 5mmol/l or 25mmol/l glucose for times indicated. Levels of RIP2 were determined by Western Blot analysis. RIP2 knock down was achieved using siRNA against RIP2. Caspase-1 activity was measured using a specific fluorescence substrate (YVAD-AFC). Results demonstrate that high glucose significantly increased RIP2 protein levels by 275 ± 32%. Interestingly, IL-1β treatment also significantly increased RIP2 levels by 263 ± 23%

indicating that once caspase-1 is activated a vicious cycle of IL-1β production can be created and maintained via continuous RIP2/caspase-1/IL-1β signaling subsequently leading to chronic inflammation. Knock down of RIP2 by siRNA prevented RIP2 upregulation and caspase-1 activation. Taken together, results demonstrate that RIP2 is a major regulator of caspase-1 activation under hyperglycemic conditions. Therefore, RIP2 has the potential to be a protein of interest in developing novel treatment strategies for diabetic retinopathy.

IMPLICATIONS OF PURVATE KINASE ISOFORM EXPRESSION ON METABOLISM OF PANCREATIC CANCER
Lauren Newhouse
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 12:30 PM-12:45 PM
Mentor(s): Eran Andrechek (Physiology)
Pancreatic cancer is one of the most deadly forms of cancer with a five year survival rate of only 2%, largely due to limited treatment options. One major difference between pancreatic cancer cells and normal cells is in metabolism. Pancreatic cancer cells rely on an altered sugar metabolism to generate energy and supply the building blocks for tumor growth, a phenomenon known as the Warburg effect. While we take advantage of this metabolic difference for diagnostic purposes, we do not fully understand why cancer cells have an altered metabolism and therefore have not exploited it for cancer therapy. This altered metabolism relies on a central metabolic enzyme called pyruvate kinase. In this work, we probe the effect of different forms of pyruvate kinase enzymes on the altered metabolism of pancreatic cancer cells by combining genetic approaches with mass spectrometry-based examination of metabolites. We find that pyruvate kinase affects sugar contribution to various metabolic pathways. We also investigate the differential effects of current chemotherapeutics on pancreatic cancer cells expressing different forms of pyruvate kinase. This research shows a fundamental difference in cellular metabolism that fuels pancreatic cancer growth, and explores new ways to exploit the altered metabolic dependencies to improve treatment options.

IDENTIFICATION OF CANDIDATE GENE(S) AFFECTING HISTONE METHYLATION AND DEVELOPMENT IN *ARABIDOPSIS* THROUGH GENETIC MAPPING AND A COMPUTATIONAL APPROACH
Katelyn Leniczek
Category: Cell Biology, Genetics, and Genomics, Section 1
Location: Tower Room, 12:45 PM-1:00 PM
Mentor(s): Steve van Nocker (Horticulture)

Proper gene regulation is dependent not only on DNA sequence but also how proteins package the DNA. This complex of DNA and proteins, called chromatin, allows different portions of the genome to be activated or inactivated. The major component of chromatin is histones, which are methylated in order to accomplish this regulation. Much is known about the structure of chromatin, but less is known about how the structure is associated with gene activation. The goal of this research is to identify a gene(s) that is functionally related to Paf, a transcription cofactor that participates in histone methylation. We used recombination mapping to locate this gene to a 2.5-megabase pair region. RNA of both the inflorescence apex and seedling of the wild type and mutant plants was sequenced. Subsequent comparison of transcriptional levels within the mapped region showed genes that were abnormally expressed in the mutant. A computational method was developed to analyze abnormal transcriptional activity outside of genes. One of the candidate genes encodes a subunit of the COMPASS complex, a protein that methylates histone H3 on lysine 4. This research will hopefully provide insights to how histone methylation leads to the activation or inactivation of certain parts of the genome.

POSTER PRESENTATIONS, SECTION 1

SURAMIN SENSITIVE P2 RECEPTOR IS INVOLVED IN α1-ADRENERGIC RECEPTOR MEDIATED MESENTERIC ARTERIAL CONSTRICTION IN NORMOTENSIVE AND DOCA-SALT HYPERTENSIVE RATS
Mary Lian
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 75
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Elahe Crockett (Medicine), James Galligan (Pharmacology & Toxicology), Hui Xu (Pharmacology & Toxicology)

Pannexin-1 is an ATP permeable hemichannel that mediates ATP released from smooth muscle cells (SMCs) in response to stimulation of α1-adrenergic receptors (AR) by norepinephrine. ATP is released and acts back on vascular SMCs to further enhance adrenergic constriction. It is unclear if the channel function is altered in hypertension. Our earlier studies have indicated that pannexin-1 activation contributes to α1-AR mediated mesenteric arterial (MA) constriction in normotensive (sham) and DOCA-salt hypertensive rats, since the concentration-response curves (CRCs) of phenylephrine (PE) were significantly right-shifted by mefloquine (a pannexin-1 blocker) in all MA. In this study, we determined the role of P2 receptors in α1-AR mediated MA constriction in both rats. PE and ATP-induced MA constrictions were recorded using a pressure myograph and video microscopy before and after adding P2 receptor (P2R) antagonists. The PE-CRCs were similar in MA from sham and DOCA-salt hypertensive rats with or without PPADs, a P2X/P2Y1 receptor antagonist. PPADs shifted ATP-CRCs to the right in all MA. PE-CRCs in all MA were significantly right-shifted in a concentration-dependent manner by

suramin, a P2X/P2Y2 receptor antagonist. Our studies indicate that α1-AR mediated constrictions of rat MA are not caused by ATP released from SMCs to acting on PPADs sensitive P2X or P2Y1 receptors. A suramin-sensitive P2R may mediate the ATP-induced MA constriction caused by α1-AR activation of pannexin-1 ATP permeable channels on SMCs. (Supported by NIH 5-R25-HL108864-01 and HL P01 HL070687).

HISTOLOGICAL CHANGES IN THE DEVELOPING HUMAN MENISCUS DURING THE FIRST DECADE OF LIFE: A PRELIMINARY STUDY
Nicholas Shermetaro
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 76
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Steven Arnoczky (Small Animal Clinical Sciences)

Menisci are c-shaped, fibrocartilaginous discs within the knee joint that increase articular congruity and joint contact between the tibia and femur. The menisci begin as a condensation of mesenchymal cells within the developing joint space of the knee at approximately 9 weeks of fetal development and continue to remodel in response to in utero joint motion. While the menisci appear as smaller versions of the adult structures at birth, little is known about the histological changes which occur in the meniscus during the early years of childhood and the onset of weightbearing. Therefore, the aim of this study was to characterize the histological changes in the meniscus that occur during the first decade of life. Medial and lateral menisci from cadaveric donors (10 mos to 11 yrs of age) were obtained from a tissue bank. Transverse sections taken from various locations of each menisci were processed for routine histological examination. Histomorphometric analysis was performed to determine if changes in cell density, cell shape (nuclear aspect ratio), and total cell number occurred with age. There was a significant decrease in cell density over the first decade of development ($p<0.001$) and the cell nucleus became more rounded ($p=0.034$). However, there was no significant change in total number of cells ($p>0.068$) or nuclear area ($p>0.071$). The decrease in cell density and nuclear aspect ratio is likely due to an increase in extracellular matrix synthesis and deposition in response to the increased loading which occurs during the first decade of life.

PREGNANCY INDUCED CHANGES IN PROGESTERONE RESPONSE OF BREAST TISSUE
Alexander Palffy
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 77
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Mark Aupperlee (Physiology)

Numerous studies have established a link between progesterone (P) and increased breast cancer risk. P levels are highest during pregnancy, driving the formation of alveolar structures necessary for lactation, and inducing leukocyte recruitment indicative of an inflammation-like response in the breast. A short-term increase in breast cancer risk is associated with pregnancy, but pregnancy can also have a long-term protective effect against breast cancer, suggesting that pregnancy may permanently alter the breast. Consistent with this, after pregnancy the involuted mammary gland shows reduced macrophage recruitment by P compared to the nulliparous mammary gland. Macrophage recruitment is often associated with angiogenesis and tumor progression. In this study, P-induced angiogenesis was examined before and after pregnancy. It was hypothesized that pregnancy alters the P response resulting in reduced angiogenesis. Immunohistochemical detection of the platelet cell adhesion molecule CD31 was examined as a measure of angiogenesis in mammary glands from adult age-matched nulliparous and post-pregnancy ovariectomized mice treated with vehicle control or P. The post pregnancy mammary gland had reduced CD31 expression compared to the nulliparous mammary gland. While P increased CD31 expression in the involuted gland, this increase was reduced compared to the nulliparous response. These findings suggest that the P response is altered after pregnancy. The decrease in inflammatory cell recruitment and angiogenesis may be related to a protective effect of pregnancy on breast cancer risk.

SELECTIVE INTESTINAL VITAMIN B12 MALABSORPTION WITH PROTEINURIA IN BEAGLES
Shelby Hemker
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 78
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): John Fyfe (Microbiology and Molecular Genetics)

Selective intestinal vitamin B_{12} malabsorption with mild proteinuria, also known as Imerslund-Gräsbeck syndrome (I-GS), is an autosomal recessive disorder previously described in several beagles in Australia and two in the United States. The resultant vitamin deficiency causes dyshematopoiesis, weakness and lethargy, failure to thrive, and hyperammonemia in the juvenile period. Mutations in CUBN and AMN, genes that encode the components of the intrinsic factor-vitamin B_{12} receptor in intestine and kidney tubules, have been found to cause the disease in giant schnauzers, border collies, and Australian shepherds. All exons and flanking splice sites were amplified in both genes in one of the affected beagles. We found a single base deletion in exon 8 of CUBN that predicts a frameshift and early truncation of the protein, likely activating nonsense-

mediated mRNA decay. Alleles of the putative mutation site segregated with the deduced disease alleles in a family of beagles from Australia as well as the sporadic cases. It was not observed in 37 unrelated beagles and 5 I-GS affected dogs of other breeds. A western blot of total cell protein from kidney cortex of an affected beagle probed with anti-canine CUBN revealed undetectable levels of CUBN. A genetic test for beagle I-GS is publically available.

IDENTIFYING LIPIDOMIC AND PROTEOMIC BIOMARKERS OF COLON POLYP RISK BY TANDEM MASS SPECTROMETRY
Jeremy Ratiu
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 79
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Jenifer Fenton (Food Science & Human Nutrition), Austin Pickens (Food Science & Human Nutrition)
The expression of low abundance proteins (LAP) and phospholipids in blood components of individuals with colorectal polyps can be used to identify potential biomarkers predictive of polyp severity (i.e. hyperplastic or adenoma) and risk. This could aid in fast, accurate, and noninvasive detection of colorectal polyps. Fold changes in expression of specific LAP can identify potential biomarkers for lean and obese individuals with or without colon polyps. This study used blood samples from 126 healthy male subjects 50-65 years of age. High throughput lipidomic analysis of serum phospholipid samples from 126 individuals was performed using chip-based nESI Q-TOF MS/MS with both positive and negative ion detection. Plasma samples from 36 of the individuals were combined to form 12 pools, grouped as lean with no polyps, lean with polyps, obese with no polyps, or obese with polyps. Proteome profiles for the 12 pools were obtained by depletion of 20 high abundance proteins (HAP) followed by isotope mass tagging and comparative reference analysis through LC Q-TOF MS/MS. Statistical analyses include the multivariate statistical methods: principal component analysis and orthogonal least square discriminate analysis. Lipidome data will be grouped and analyzed for statistically significant lipidome markers for the presence of polyps, and polyp number and severity.

THE ROLE OF CARBOXYLESTERASES IN ACYL SUGAR BIOSYNTHESIS/DEGRADATION IN *SOLANUM*
Karin Hanisch
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 80
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Robert Last (Biochemistry and Molecular Biology)

Glandular trichomes are hair-like structures found on the surface of tomato plants that secrete a variety of secondary metabolites including acyl sugars, which play a role in insect defense. Previous screening of a set of tomato lines containing regions of the *Solanum pennelii*, LA0716, genome in a *Solanum lycopersicum*, M82, background showed a region on chromosome 5 to be influential in acyl sugar production. Two genes from this region, annotated as carboxylesterases (CXEs), are highly expressed in trichomes. Both CXEs in *S. pennelii,* SpASH1 and SpASH2, appear to encode functional proteins while *S. lycopersicum* has a deletion in the second carboxylesterase, SlASH2, resulting in a non-functional protein. In assays using purified recombinant enzyme, SpASH1, SlASH1 and SpASH2 all demonstrated esterase activity *in vitro* by removing specific acyl chains from purified tomato acylsucroses. SpASH1 and SlASH1 also showed activity in degrading acylglucoses. A search of the tomato genome for other trichome expressed CXEs identified two genes, 09g075710 and 04g005230. Assays revealed that the *lycopersicum* and *pennellii* alleles of the gene 09g075710 encode enzymes that hydrolyze acylsucroses. No activity has been detected with 04g005230 enzyme, however not all possible substrates have yet been tested. The exact biological role of CXEs in acyl sugar biosynthesis in planta is not yet known. Future experimentation will utilize transgenic plants to further explore *in vivo* carboxylesterase function.

LIFE HISTORY TRAIT TRADE-OFFS IN EXPERIMENTALLY EVOLVED PHAGE LAMBDA
Rachel Sullivan
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 81
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Alita Burmeister (Microbiology & Molecular Genetics)

Evolutionary trade-offs occur when an adaptation, which is a beneficial trait, constrains another adaptation. This principle has been widely applied to many life history traits, including in viruses where evidence suggests that replication within the host may constrain stability outside the host over long time scales (De Paepe, 2006). We hypothesize that a population of obligately lytic bacteriophage Lambda when evolved for a short time under selection for host binding affinity (Lenski, 2012, Burmeister in prep), would become better at binding, but would lose environmental survival as a result. To test this, we observed the survival rates of the ancestor λ and six experimentally evolved descendants. We found that none of evolved viruses had higher stability than the ancestor, but half were less stable than the ancestor. Surprisingly, we also observed high variation among the evolved. There was also a significant difference in the initial and final decay rates in 5 of the 6 evolved isolates, suggesting high phenotypic variation. Our results suggest that over short timescales, evolutionary tradeoffs do not completely determine, but may play a role in generating, variation among life history traits.

FREE-FATTY ACID INDUCED METASTATIC PATHWAYS IN LIVER CANCER
Irene Li
Category: Cell Biology, Genetics, and Genomics, Section 1
Poster: 82
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Christina Chan (Chemical Engineering & Materials Science)

Liver cancer is one of the deadliest cancers in the United States, containing a concerning propensity to invade to other parts of the body via the epithelial-mesenchymal transition (EMT). Due in part to the paucity of specialized treatment options, prognosis is extremely poor for liver cancer patients with extrahepatic metastases. We previously found a correlation between elevated levels of the free fatty acid palmitate (PA) and the invasive EMT phenotype in HepG2 and Hep3B liver carcinoma cell lines. We will identify and analyze the mechanisms causing these effects, allowing development of specific biochemical targets against metastasis. Using high-throughput polymerase chain reaction assays, we screened for signaling pathways that could be responsible for EMT in PA-treated cells, identifying the TGF-β and Wnt pathways as key effectors in treatment conditions. We validated the screening results by testing for pathway-specific transcription factors with polymerase chain reaction arrays and confocal image analyses. This led us to further hypothesize that inhibiting the TGF-β and Wnt pathways may reduce the EMT phenotype in PA-treated cells. As such, we will introduce chemical inhibitor treatment, repressing TGF-β dependent growth and Wnt-induced target genes. By quantifying cytotoxicity and proliferation in treatment conditions in the pathway-inhibited cells, we expect decreased cytotoxicity and proliferation levels in PA-treated cells, compared to elevated levels in the absence of inhibitory agents. This may suggest that the selected pathways are responsible for increased proliferation in the PA-treated condition.

POSTER PRESENTATIONS, SECTION 2

MONITORING CYCLIC GENE EXPRESSION IN *NANNOCHLOROPSIS OCEANICA*
Andrew Lapinsky
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 83
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Eva Farre (Plant Biology)

Nannochloropsis oceanica is a marine microalgae that has the ability to produce and store substantial amounts of oils and carbohydrates. These cellular products can be harvested from the algae and used to make biofuels. Many fundamental processes, such as cell cycle and lipid production, operate diurnally in *Nannochloropsis* and could possibly be regulated by its circadian clock. For this reason, it is important to investigate how the circadian clock of *Nannochloropsis* works on a genetic level. To find possible clock regulation genes, it is essential to have a tool for observing their expression patterns in vivo. I have helped to create a reporter construct that expresses firefly luciferase, a luminescence compound. The construct has a Gateway cloning feature, which allows for easy insertion of different promoter sequences from target genes. The promoter sequence from a target gene triggers the expression of luciferase in the reporter anytime the target gene would normally be expressed in the cells. The luciferase gives us a visual and quantitative measure of the gene expression when viewed with a luminometer. This reporter gives us the ability to monitor gene expression using an automated system for multiple days at a time, yielding data that would otherwise be difficult to collect manually. The Gateway cloning system has allowed us to create multiple unique reporter lines to monitor different genes. The knowledge gained from these experiments will help us discover more about the circadian clock of *Nannochloropsis*.

EFFECTS OF E2F5 EXPRESSION ON MAMMARY GLAND DEVELOPMENT
Lauren Jackson
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 85
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Eran Andrechek (Physiology)

The transcription factor E2F was discovered as a factor that bound to the E2 gene promoter. The factor is regulated by the retinoblastoma protein and associated with growth control. E2F5 is a repressor that inhibits transcription of E2F target genes. Little is known about the effects E2F5 has on mammary gland development, especially during puberty. MMTV-Cre E2F5 Flox/Flox mice (no E2F5) were utilized as well as a control sample. At 4 and 8 weeks of age, the mammary gland from the inguinal area was harvested from the sample of female mice. The tissue samples were studied and ductal growth was measured. The outgrowth of the ducts was determined by measuring the distance between the nipple and terminal end bud and between the nipple and lymph node. The average outgrowth of MMTV-Cre E2F5 Flox/Flox and E2F5 Flox/Flox were compared at four weeks (0.86 mm and 1.04 mm, respectively). The same process was done at eight weeks and outgrowth was once again measured (1.76 mm and 1.73 mm). The results show that MMTV-Cre E2F5 Flox/Flox has an 82.7% outgrowth in comparison to the control at four weeks, revealing a delay in growth. Examination of the mammary glands at eights weeks

revealed the outgrowth of MMTV-Cre E2F5 Flox/Flox mice had caught up to the control mice. E2F5 appears to have a role in the growth of the mammary gland during the early stages of puberty, yet, by eight weeks; E2F5 appears to have less of an influence on growth.

REGULATED TURNOVER OF RETINOBLASTOMA PROTEIN: STRUCTURAL DETERMINANTS AND GOVERNANCE THROUGH PHOSPHORYLATION
Zachary Penrod
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 86
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): R 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. Inactivation of RB through loss-of-function mutations or aberrant degradation is associated with several forms of human cancer. Thus, understanding the mechanisms of Retinoblastoma family protein degradation could have a profound effect on what we know about cancer and how we are able to treat it. The first goal of our project is to identify the specific regions in RB proteins that target them for degradation, and to determine if these sequences can function as a modular degron. Interestingly, the putative region governing RB stability also harbors several conserved phosphorylation sites. As phosphorylation of various other proteins has been shown to modulate their stability, we propose that phosphorylation events within the RB degron are key to its function as an instability element. To this end, our second aim is to study the effects of phosphomimetic and phosphoresistant mutations within the degron on protein stability. Taken together these studies will help us in resolving the mechanisms that govern regulated turnover of this important tumor suppressor family.

ISOLATION AND IDENTIFICATION OF THE SODEFRIN GENE IN AXOLOTLS FOR INVESTIGATION OF BIOLOGICAL SIGNIFICANCE
Victoria Zielinski
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 87
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Barry Williams (Zoology)

The male Japanese red-bellied newt produces a sex pheromone that is encoded in the sodefrin gene and is used for female attraction during mating. This gene is found in the genomes of numerous salamanders and has a specific identifying factor of a three-finger domain, apparent with the numerous cysteines that form disulfide bridges. The model organism used for this study was the axolotl. Our lab isolated a suspected sodefrin gene from the axolotl genome and cloned the insert with the gene into PGEMα-easy vectors with ampicilin resistance. These PGEMα-easy vectors were transformed into DH5α E. coli cells and the plasmid DNA was isolated and sequenced to identify the insert and confirm that it matched the salamander sodefrin gene, estimated to be approximately 820 base pairs in length. In order to further solidify that the insert on the isolated vectors contain the target sodefrin gene and not a contaminate or incorrect clone, PCR screens and restriction enzyme digests using HpyCH4IV, a 2 cutter enzyme, were performed on all isolated samples. Once all samples are quantified and pooled, they will be used to produce large amounts of the sodefrin protein through a eukaryotic system. Further studies will then test the chemical response to the sodefrin protein in axolotls to study its biological significance.

THERMAL PLASTICITY OF BODY AND ORGAN SIZE IN *DROSOPHILA MELANOGASTER*
Johnathon Constan
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 88
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Shampa Modak (Zoology)

Environmental factors can lead to variation in phenotypic expression arising from the same genotype, a phenomenon known as phenotypic plasticity. In 85% ecothermic animals, higher developmental temperature leads to plastic changes in body size, giving rise to smaller individuals. The developmental genetic basis of this plastic change in size induced by temperature (thermal plasticity) remains unknown. We investigated the genetic and genomic bases of thermal plasticity in the fruit fly, *Drosophila melanogaster*, which is an excellent model system for genetic and genomic research. In fruitflies, not only higher temperature leads to smaller individuals, but also different body parts of the fly show varying levels of thermal plasticity. Using flies from the *Drosophila* Genetic Reference Panel (DGRP), we reared 100 DGRP lines in the laboratory at 17˚C, 25˚C and 28˚C and measured the thermal plasticity of thorax, wing and femur size. Wing size is highly plastic showing 28% reduction on average from 17˚C to 25˚C, and 8% reduction from 25˚C to 28˚C. Thermal plasticity of thorax and femur are relatively low as the former demonstrated 12% reduction in size from 17˚C to 25˚C and the latter underwent 9% reduction in the same thermal range. From 25˚C to 28˚C, thorax size showed a small but significant reduction of 4% whereas femur did not show any significant change in size. The measure of thermal plasticity varied widely across lineages, which suggest there is ample genetic variation for thermal plasticity in nature.

EFFECTS OF IRF6 IN CLEFT PALATE CASES
Christina Brown
Category: Cell Biology, Genetics, and Genomics, Section 2
Poster: 89
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Brain Schutte (Microbiology and Molecular Genetics)

Cleft palate or a cleft lip is a condition of when the roof of the mouth, the hard palate, is not completely joined together. This is seen a lot in Asian based countries. There is a treatment for this disease, but the cause of this disease is unknown. There is continuous research being done on this disease to pin point what exactly causes cleft palates. Van der Woude Syndrome is type of cleft palate that causes deformities by threefold. IRF6 increases the likeliness of Van der Woude to occur, but there is a lot unknown about this gene. Many other factors contribute to the function of IRF6, and when levels of IRF6 are increased or decreased past a certain point, cleft palates will occur.

POSTER PRESENTATIONS, SECTION 3

SKELETAL MUSCLE CHLORIDE CHANNEL 1 EXPRESSION IN TRANSGENIC MOUSE MODELS OF KENNEDY'S DISEASE
Donald Zeolla
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 92
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Cynthia Jordan (Neuroscience)

As neurodegenerative diseases compromise the health of more than six million individuals in the United States and cost our economy over $100 billion per year in healthcare, it is a priority to better understand their pathology. Kennedy's disease (KD) is a neurodegenerative disorder with no known treatment that is caused by trinucleotide CAG repeat expansion in the DNA of the androgen receptor (AR) gene. Although the cellular mechanisms of KD remain largely unknown, current research has identified relationships between mutant AR and alternative splicing of adult skeletal muscle chloride channel 1 (*Clcn1*) as a possible disease contributor, causing reduced *Clcn1* expression that leads to adult-onset muscle weakness. We are using quantitative real-time PCR (qPCR) to analyze relative levels of *Clcn1* expression in two transgene mouse models of KD, one of full-length human AR with 97 CAG repeats inserted, and one that overexpresses rat AR in only muscle fibers. We first aim to validate that adult mice express more *Clcn1* than developing mice, since research shows that neonatal muscle fibers do not express *Clcn1*. We will then compare *Clcn1* expression in extensor digitorum longus and soleus muscle fibers of the two transgenic KD models to age-matched controls. We expect less *Clcn1* expression in transgenic mice compared to controls. This project will provide further insight to understanding KD and other CAG repeat disorders and will guide future research in improving management of similar neurodegenerative conditions.

IDENTIFICATION OF RHIZOBIAL GENES THAT ARE USED IN PARTNER CHOICE OF *MEDICAGO TRUNCATULA*
Alexander Diedrich, Kelly Potts
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 93
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Maren Friesen (Plant Biology)

Medicago truncatula is the model species of legume chosen for the study of the plant and bacterial nitrogen-fixing symbiosis that promotes the growth of most legumes. This project focuses on characterizing genes of bacterium *Ensifer meliloti* that are an essential component of the strain being chosen as a symbiotic partner to the legume *M. truncatula*. Nodulation is a complex issue, as it involves bacterial population dynamics, the environment, and the plants "choice" of partner. Exploring the latter aspect, I am creating a transposon randomly mutagenized population of *E. meliloti* to be inoculated onto A17 classic genotype of *M. truncatula.* Transposon insertion sequencing of these inoculations on the root surface and in the nodules that form from the symbiosis. Sequencing will identify which genes have been inserted into, and then the frequency of each gene in the population will be determined. Reductions in gene frequency from the frequency in a rich medium indicate the gene is important for reaching the root surface or entry into a nodule, while an increase in frequency indicates the knockout was beneficial for these situations. These relative gene frequencies can then be individually correlated into relative fitness values and the individual genes identified will be compared to known literature discussing nodulation genes. Novel genes will be explored individually in pairwise assays. Combined, these results will indicate which bacterial genes and characteristics are beneficial or essential for symbiosis with *M. truncatula.*

THE ROLE OF PYRUVATE DEHYDROGENASE ACTIVITY IN INTRACELLULAR ENERGETICS AND CARBOHYDRATE METABOLISM
Joshua Hubert
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 94

Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Robert Wiseman (Physiology)

Patients with Type II Diabetes (T2D), a disease hallmarked by hyperglycemia, show decreased pyruvate dehydrogenase activity (PDH). This enzyme is located in the mitochondria and is responsible for the conversion of the glycolysis product pyruvate to acetyl-CoA, and is a selection point for oxidation of carbohydrates or fats as well as the generation of reducing equivalents (NADH) for electron transport chain. This complex PDH regulation permits healthy subjects to balance oxidative demands with post-prandial plasma substrates. Therefore, an increase in PDH activity can have dramatic effects by both decreasing plasma glucose levels as well as increasing intracellular energetic status. To investigate the role of PDH activity levels on energetics, a pharmacologic activator (Dichloroacetate (DCA)) was used. In this study, anesthetized Wistar rats performed posterior leg contractions triggered by electric pacing at 0.35, 0.5, 0.75, and 1.0 Hz. DCA was administered and the exercise bouts were repeated. To measure energetic status, phosphorus nuclear magnetic resonance (NMR) spectroscopy was employed to record the levels of Pi, PCr, ATP and intracellular pH. Preliminary data shows increased activation of PDH via DCA results in significant reduction of PCr hydrolysis and Pi concentration during stimulation at frequencies within the aerobic capacity (0.35, 0.5, 0.75 Hz) but no difference at high frequency stimulation (1.0 Hz), which is above the mitochondria aerobic threshold. This data suggests PDH activation prior to exercise improves mitochondrial ATP synthesis and may improve utilization of glucose.

AN AGE-RELATED DECREASE IN PRIMARY CILIA MAY REPRESENT A DECREASE IN THE MECHANO-RESPONSIVENESS OF AGING TENDON CELLS
Rachael Johnson
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 95
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Steven Arnoczky (Small Animal Clinical Sciences)

Primary cilia are tubulin based structures that sense and regulate the local mechanical environment of tendon cells through a variety of signaling pathways. The inability of tendon cells to maintain their normal tensional homeostasis following periods of repetitive use has been implicated in the etiopathogenesis of tendinopathy. It is possible that the reason age is a significant risk factor for developing tendinopathy is due to an age-related decrease in the mechano-sensitivity of tendon cells. We hypothesized that there is a significant decrease in the prevalence of primary cilia on aging tendon cells which could lead to a decrease in their mechano-sensitivity. Following institutional animal care and use approval, tail tendon cells (TTCs) were isolated from 3-4 month old Spraque-Dawley rats. The TTCs were subjected to an in vitro aging protocol by multiple passages (1-10) under standard cell culture conditions. At each passage the tendon cells were stained for tubulin and examined microscopically to identify the prevalence of primary cilia. The data was analyzed using a Pearson's correlation coefficient analysis. There was a strong ($r^2 = 0.76$) and significant ($p = 0.001$) negative correlation between increasing passages (age) of tendon cells and the prevalence of primary cilia. The decreased presence of cilia with increasing age may reduce the mechano-sensitivity of aged tendon cells, thus limiting their ability to maintain normal, cytoskeletal tensional homeostasis. This age-related decline in the mechano-sensitivity of tendon cells may explain the relationship of age as a risk factor in the development of tendinopathy.

BONE ADIPOCYTE REGULATION BY LEPTIN RECEPTOR SIGNALING
Ian McCabe
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 96
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Gina Leinninger (Physiology), Laura McCabe (Physiology), Narayanan Parameswaran (Physiology)

Osteoporosis is responsible for almost 9 million fractures worldwide annually, suggesting that existing treatments are not fully effective. Knowledge of bone density regulation is crucial for identifying superior therapeutic targets. Our lab is investigating one of these targets, the leptin receptor. We hypothesize that correct functioning of the leptin receptor and its signaling plays a crucial role in proper bone density and health. Therefore, I examined bone parameters in wild type mice compared to mice carrying mutations in the leptin receptor that alter signaling phosphorylation sites. Three different mutation sites were studied, one of which completely blocked signaling (delta65) while two others partially affected signaling (LL, SS). To compare the effect of the mutations on bone fat, which increases with bone loss, I quantified the number of adipocytes in the bone marrow of each mouse. Complete inhibition of receptor signaling significantly raised the number of adipocytes in males, a similar trend existed in females. This inversely correlated with bone density, which was significantly decreased in the mutant mice. The SS mutation increased adipocytes in males only (which also had low bone density), while the LL mutation had no significant effect on adipocytes or bone density. Taken together, my findings contribute to understanding the role of leptin receptor signing in the regulation of bone marrow adipocytes and density.

PCR SMEAR YIELD FOR CYSTIC FIBROSIS G551D MUTATION DIAGNOSTIC ASSAY IN HOMO SAPIEN IB3-1 CELLS
Abdulraouf Abbas
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 97

Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Douglas Luckie (Lyman Briggs College)

The CFTR G551D mutation accounts for 4-5% of cystic fibrosis cases (Ramsey et al, 2011). The mutation of interest, G551D, is a nonsense mutation, occurring on chromosome 7, codon 551 of exon 11 (Duthie et al, 1992). Guanine is miscoded for adenine resulting in a CFTR gating defect (Hamosh et al, 1992). Our research attempts to develop a diagnostic assay for the G551D mutation for wildtype Homo Sapien DNA in IB3-1 bronchial cells; we hypothesize that published wild type primers will yield 400 basepair long sequences after amplification via PCR replication for wild type DNA because published primers will bind at base 1784 to 1763 of exon 11 and extend to base 1384 at optimum annealing temperatures when undergoing PCR in the as a result of primer specificity and mechanism. This will be displayed on an agarose gel as bands that correspond to 400bp bands on the 1kb+ ladder via gel electrophoretic analysis (Martinelli and Arruda, 1998). Published primers will anneal successfully because of allele-specific binding. Enterobacteria phage λ genomic DNA, our control, has tested for reagent function of dNTP's, PCR buffer, taq polymerase as well as the function of the thermoregulator. IB3 bronchial cells were lysed and eluted for use in design and published PCR, yielding a DNA concentration of 0.15mg/mL. Published primers extracted from Martenelli et al. research served as our forward wild type (WT) primer as well as the reverse primer (R). Our trials yielded smears around the 400 bp areas, indicating non-specific binding.

BLACK QUEEN COEXISTENCE IN THE PRESENCE OF ANTIBIOTIC
Robert Fillinger
Category: Cell Biology, Genetics, and Genomics, Section 3
Poster: 98
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Richard Lenski (Microbiology & Molecular Genetics)

The Black Queen Hypothesis (Morris et al. 2012, mBio) is a theory of reductive genome evolution caused by "leaky" functions (functions whose products can be utilized by other organisms) and their exploitation by nearby organisms that cannot perform the function. A coexistence between two or more competing organisms can develop because they share a need that is provided by a "helper" organism and exploited by a "cheater" organism because cheating allows it to reallocate more resources for reproduction. This experiment focuses on the Black Queen coexistence that is established between an antibiotic resistant strain of *Escherichia coli* and its non-resistant descendant in the presence of an antibiotic. The descendant (the cheater) will lose its ability to remove the antibiotic because its ancestor (the helper) will retain the ability to deal with the antibiotic. The levels of antibiotic will be reduced, thus allowing the non-resistant descendant to grow without antibiotic resistance. If the descendant's population grows too large, the concentration of antibiotic will increase, allowing for an increase in the ancestor's population. Given time, this fluctuation in populations will reach equilibrium. This experiment has important implications in medicine because antibiotic resistant genes could be found in the non-pathogenic fraction of a bacterial population while providing susceptible pathogens with antibiotic resistance. This project also has applications in ecology as these relationships have never been studied before. This experiment will also prepare ground work for future Black Queen Hypothesis tests that may include three or more organisms.

POSTER PRESENTATIONS, SECTION 4

THE PHYSIOLOGICAL PURPOSE OF LIPID ACCUMULATION IN *CHLAMYDOMONAS REINHARDTII*
Bradley Disbrow
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 100
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Yair Shachar-Hill (Plant Biology)

Microalgae are regarded as a promising feedstock of biofuel. Under nitrogen starvation, numerous species of microalgae experience limited growth and accumulate large quantities of lipids, including triacylglycerols (TAG) which can be easily transesterified into biodiesel. The physiological purpose of lipid accumulation, however, remains unknown, with the role of photosynthesis in lipid storage remaining especially unclear. Many have posited that as growth slows, TAG serves to divert excess electrons from the photosynthetic electron transport chain, to prevent electron backup and cellular damage. The experimental evidence for this hypothesis is incomplete, so in order to clarify the physiological purpose of TAG accumulation, growth studies and biochemical characterization of model green microalga *Chlamydomonas reinhardtii* were performed. Microalgae were grown in batch culture in nitrogen deprived media and samples were taken every 24 hours over a 96-hour time-course. Samples were analyzed for growth, chlorophyll count, and substrate uptake rates. To measure TAG accumulation, lipids were extracted from cells using chloroform-methanol, separated using thin-layer chromatography, and the scanned images were analyzed using computer-aided densitometry. Further, metabolic flux analysis will be conducted on *C. reinhardtii* to mark the flow of carbon into TAG during movement from nitrogen repletion to nitrogen deprivation. These data will be used to relate growth and photosynthetic conditions (light intensity, chiefly) to lipid accumulation to determine whether the "overflow" hypothesis holds empirically, or if a different viewpoint is necessary to explain the physiological role of TAG accumulation in microalgae.

MICRORNA-200B RE-EXPRESSION INCREASES CHEMOTHERAPEUTIC EFFICACY IN TRIPLE NEGATIVE BREAST CANCER CELLS
Amy Trinh
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 101
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Chengfeng Yang (Physiology)

Triple negative breast cancer (TNBC) refers to a group of heterogeneous breast cancers that lack expression of estrogen receptor (ER), progesterone receptor (PR), and human epidermal growth factor receptor 2 (HER2), accounting for 10-20% of newly diagnosed breast cancer cases each year in the United States. No efficient targeted therapies for TNBCs are currently available and chemotherapy is the only available treatment. TNBCs are found to be more resistant to chemotherapeutic drugs because they exhibit mesenchymal-lke cell characteristics, possibly due to low expression of the microRNA-200 (miRNA-200, miR-200) family. MiRNAs are small non-coding RNAs and are found to play important roles in cancer development, progression, and responses to chemotherapies. The objective of this study is to investigate whether forced expression of miR-200b, a member of miR-200 family, can make mesenchymal-like TNBC cells more sensitive to the cytotoxic effect of 5-Fluorouracil (5-FU), a commonly used chemotherapeutic drug. We found that forced expression of miR-200b significantly reduces mesenchymal-like TNBC cell proliferation, converting mesenchymal-like TNBC cells to epithelial-like cells. Moreover, compared to control cells, miR-200b stably expressing TNBC cells are more sensitive to the cytotoxic effect of 5-FU. Further mechanistic studies revealed that this phenotype might involve the BMI1 pathway. Together, these results suggest that miR-200b may be a beneficial target concurrent with chemotherapy in increasing the efficacy of chemotherapeutic drugs for TNBCs.

IMPROVING CONJUGATIVE TRANSFER FROM *ESCHERICHIA COLI* TO NITROGEN FIXING CYANOBACTERIUM *ANABAENA VARIABILIS*
Ognenka Avramovska
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 102
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Sigal Lechno-Yossef (Plant Research Laboratory), Peter Wolk (Plant Research Laboratory)

Abstract: *Anabaena variabilis* ATCC 29413 is a filamentous heterocyst-forming cyanobacterium that has been extensively studied because of its very unique properties. It is able to produce hydrogen gas through solar energy and has complex life cycle involving a variety of differentiated cells: heterocysts, specialized cells where nitrogen fixation takes place, and akinates, spores that are evolutionarily linked to heterocysts. Although the genome of this organism has been sequenced, it is still very difficult to study using standard genetic techniques. In order to further study this strain of *Anabaena variabilis*, the creation of a shuttle vector capable of conjugative transfer from. E. *coli* to A. *variabilis* is vital. A. *variabilis* has restriction enzyme and methylation systems that prevents foreign DNA from entering it. When DNA that is not methylated enters an A. *variabilis* cell, the restriction enzyme system cuts that DNA until it is no longer able to be replicated. In this research, the Ava2190 gene, coding for a putative methylase, was cloned into a plasmid that may protect the incoming DNA from being cut by one of the native restriction enzyme systems. A similar system transformation system was already developed for *Anabaena* sp. strain PCC 7120 with three methylase genes successfully. With this is mind, it can be hypothesized that the 2190 methylase gene has the potential to methylate the cargo plasmid, and allow the successful transfer of plasmids from E. *coli* to A. *variabilis.*

PRELIMINARY CHARACTERIZATION OF THE UGT GENE FAMILY IN *STEVIA REBAUDIANA*
Kyle Brasier
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 103
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Veronica Vallejo (Horticulture), Ryan Warner (Horticulture)

Stevia rebaudiana hosts a family of sweet tasting compounds called steviol glycosides, which are significantly sweeter than sucrose and do not elicit a glycemic response. Understanding the variability of uridine diphosphate glycosyltransferases (UGTs), a group of enzymes that catalyze biosynthesis of steviol glycosides, helps us elucidate the synthesis of these economically important compounds. The objectives of this work were to mine the reference transcriptome for members of the UGT gene family and to validate the sequence of some of these genes using sanger sequencing. Fifteen UGT gene sequences from stevia were downloaded from NCBI. Putative peptide sequences were extracted from the UGT genes and the reference transcriptome using the ORF Predictor software. The UGT genes were used as queries against the reference transcriptome using Blastp resulting in the identification of 35 of UGT homologs. The relationship of these genes was explored by constructing a phylogram using the ClustalW2 software. Based on this analysis, the 74G subfamily of UGTs seems to have undergone significant diversification. To validate the sequence of the UGT genes PCR was used to amplify the open-reading frame, cloned and sequenced. Blastn was used to align the resulting sequences with the corresponding UGT

genes. This analysis revealed that the amplified products are nearly identical to the transcriptome sequences providing validity to the de novo assembly methods used to construct the reference.

PCR AND GEL ELECTROPHORETIC ANALYSIS OF CANINE CELLS TO REVEAL R812W MISSENSE MUTATION ON CFTR GENE
Ahmad Tahawi
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 104
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Douglas Luckie (Physiology)

Cystic fibrosis (CF) is an autosomal recessive disease that is among the most common genetic disorders (Rowe et. al, 2005). CF is caused by mutations in the cystic fibrosis transmembrane conductance regulator gene (CFTR). CF due to a CFTR mutation has never been identified in non-humans. Since canines have been known to present symptoms similar to CF (such as pancreatitis and bronchiectasis) however, researchers have attempted to investigate the existence of CF in species like *Canis familiaris* (Spadafora et al, 2010). The purpose of this experiment is to identify the R812W mutation within the CFTR gene in the *Canis familiaris* species. It was hypothesized that mutant-seeking forward primers will anneal to only the mutant DNA during PCR and will reveal a band via gel electrophoresis. In order to ensure the accuracy of the equipment and protocol, primers designed for the Lambda virus Rz gene were tested prior to testing the designed primers. The forward and reverse Rz gene primers amplified a 495 bp band that was consistent with the expected amplification. Published control primers were also obtained from Spadafora for the amplification of exon 27 of the CFTR gene (320bp), which amplified a 322bp band (Spadafora et al, 2010). For the experimental primers, two forward primers were designed (a mutant and wild-type) to reveal the presence or absence of the R812W mutation. DNA was amplified using PCR and evaluated using gel electrophoresis. The R812W primer was designed to amplify 1013bp and resulted in successful amplification of 949bp during the experiment.

CF IN DOGS: DESIGNING A DIAGNOSTIC TEST FOR THE R1456W-CFTR MUTATION IN CANINES
Kathryn Kesler
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 105
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Douglas Luckie (Physiology)

While over 1600 mutations in the CFTR gene are known to cause cystic fibrosis in humans, no non-human species have yet been diagnosed with cystic fibrosis (CF). Mutations within the cystic fibrosis transmembrane conductance regulator (CFTR) gene frequently produce atypical CF symptoms in *Canis familiaris* (Spadafora et al, 2010). The purpose of this study was to create a diagnostic assay for the R1456W mutation and ultimately identify a naturally occurring non-human model for CF. Initial control PCR tests with lambda virus Rz gene as template (500bp) successfully amplified a 495 bp band. Additional control primers, obtained from Spadafora for the amplification of exon 27 of the CFTR gene (320bp), resulted in a 322bp band. For the R1456W diagnostic primers, two forward PCR primers (mutant and wild-type seeking) and a reverse primer were created using an intentional-mismatch technique to build a robust assay (Yaku et al, 2008). The R1456W wild type seeking primer set (1003bp) successfully amplified a 972bp PCR product. The R1456W mutant-seeking primer set is currently screening a range of canine samples obtained from Spadafora for further testing. As an extension a socio-psychological study was conducted by studying the anxiety levels of researchers and canines after walking with and without an Elizabethan Cone.

INCREASING THE GROWTH OF MYCOBACTERIUM TUBERCULOSIS IN LOW PH
Navanjeet Sahi
Category: Cell Biology, Genetics, and Genomics, Section 4
Poster: 106
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Robert Abramovitch (Microbiology)

Tuberculosis is a disease that kills nearly 1.5 million people annually. One of the principal traits of this disease is its ability to grow slowly at low PH, which *Mycobacterium Tuberculosis* experiences in the macrophage as it enters the cell. The purpose of this project is to understand how *Mycobacterium Tuberculosis* initiates slow growth in the cell and additionally, if there is a way to disrupt this slow growth to disturb cell function of the bacteria. This research is important because if we can find away to disrupt the slow growth of *Mycobacterium Tuberculosis*, it will in turn affect the ability of Tuberculosis to survive in the human cell. Then we can possibly develop drug regiments that can mimic the results seen in the laboratory to defeat Tuberculosis in humans. In our experiment, we will be using transposons to mutate over 100,000 genes in *Mycobacterium Tuberculosis*. From here, we will culture the mutated Mycobacterium on minimal media using pyruvate or glycerol as a carbon source and see how these mutations affect growth. Then, we will preform an inverse PCR to amplify the mutants that showed positive results and send them for sequencing to find out which genes are active in helping *Mycobacterium Tuberculosis* grow slowly at low PH. In this presentation, I will discuss how these mutations to *Mycobacterium Tuberculosis*

genes increase growth rate and how these findings can help further benefit our knowledge on developing a more reasonable cure for Tuberculosis.

POSTER PRESENTATIONS, SECTION 5

INVESTIGATING THE POSSIBILITY OF DETERMINING A DOG'S BREED USING GENETIC VARIATIONS UNDERLYING PHENOTYPIC BREED CHARACTERISTICS
Kamryn Kurtz
Category: Cell Biology, Genetics, and Genomics, Section 5
Poster: 109
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Patrick Venta (Microbiology and Molecular Genetics)

The phenotypic diversity of dog breeds has been a topic of interest for many years. Dog breeds were created by man's selection of phenotypic traits such as size, shape, coat color and coat type. Remarkable progress has been made in identifying genes involved in coat pigmentation and variation. Using these known genotypes, one should ideally be able to predict the phenotypes associated with them. If given a DNA sample from an unknown purebred dog, is it possible to determine breed using only the genotypes that underlie specific phenotypic characteristics? I aim to establish whether this method is plausible. The purpose of this research is to determine how many phenotypic traits are necessary to determine a breed of dog. Using previously recorded research about coat genotypes of specific purebred dog breeds, I compiled a spreadsheet in order to analyze and compare a variety of different dogs. Using this spreadsheet, it was determined that analyzing currently known coat color and coat type gene data alone is not enough to ascertain a breed of dog. Multiple breeds allow a variety of colors and patterns within their standard, making it difficult to narrow a unique genotype down to just one breed. Further research into this topic should involve the analysis of other specific phenotypic characteristics. Some of these may include: size, snout length and ear type. Investigating multiple characteristics would give a better breed prediction.

THE CALVIN-BENSON CYCLES COMES FULL CIRCLE IN EUGLENOIDS
Chelsea Markunas
Category: Cell Biology, Genetics, and Genomics, Section 5
Poster: 110
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Richard Triemer (Plant Biology)

Euglenoids are an ancient eukaryotic lineage that may have existed as early as two billion years ago. In contrast, a mere 64 years ago, Melvin Calvin and Andrew A. Benson performed experiments on *Euglena gracilis* and elucidated the series of reactions by which carbon is fixed and reduced during photosynthesis. However, the history of this pathway (Calvin-Benson Cycle) in euglenoids was more complex than Calvin and Benson could have imagined. The chloroplast present today in photosynthetic euglenoids arose from a secondary endosymbiosis between a phagotrophic euglenoid and a green alga. Despite this, green algae arose ~1 billion years ago and were likely not their first food source; red algae and chromalveolates (e.g. diatoms, dinoflagellates) arose ~1.8-1.2 billion years ago and provided food for euglenoids long before green algae arose. This long period of evolutionary time provided opportunities for other endosymbiotic events or gene transfers to occur prior to the establishment of the green chloroplast. This research revealed the evolutionary history of the major enzymes of the Calvin-Benson cycle throughout the photosynthetic euglenoid lineage and showed that the majority of genes for Calvin-Benson cycle enzymes shared an ancestry with red algae and chromalveolates - which suggested that they were likely horizontally transferred to the nucleus prior to the acquisition of the green chloroplast. The history of each enzyme will be summarized, but the phylogenetic history of Triosephosphate isomerase (TPI) and Glyceraldehyde-3-phosphate Dehydrogenase (GAPDH) will be presented to illustrate how the phylogeny of each enzyme was determined.

GENOMIC CHARACTERIZATION OF *XANTHOMONAS ORYZAE* PV. *ORYZAE* RESISTANCE TO BACTERICIDE BISMERTHIAZOL
Alec Bonifer
Category: Cell Biology, Genetics, and Genomics, Section 5
Poster: 111
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Sheng Yang He (Microbiology and Molecular Genetics)

Xanthomonas oryzae pv. *oryzae* (*Xoo*) is an economically devastating plant pathogen and a causative agent of bacterial blight in rice. To combat infection, farmers use a chemical called bismerthiazol. Recently, researchers have isolated a strain of *Xoo* that is resistant to bismerthiazol treatment. This was accomplished by infecting rice with a susceptible strain (*Xoo* Zj173), treating the plant with bismerthiazol, and isolating any mutants that developed resistance. The new resistant strain, *Xoo* 2-1-1, is phenotypically indistinguishable (including sensitivity to bismerthiazol) from *Xoo* Zj173 in vitro, aside from a slightly reduced growth rate. However, in bismerthiazol-treated rice, 2-1-1 is resistant when compared to *Xoo* Zj173 [1]. This suggests that bismerthiazol is interacting with rice to combat Xoo and that 2-1-1 has evolved resistance to this mechanism. Here, we characterize the genomic basis for the *Xoo* 2-1-1 resistance to bismerthiazol. Analysis of our hybrid assembly of Illumina Hiseq

and Pacific Biosciences DNA sequences has revealed putative resistance genes, some of which are involved in amino acid degradation, sugar utilization, and biosynthetic pathways. One especially intriguing candidate is a missense mutation in the ndvB gene. ndvB is classified as a biofilm-specific antibiotic resistance gene [2]. Further mutational and phenotypic analyses will be conducted to identify the gene(s) which confer bismerthiazol resistance in *Xoo* 2-1-1.

ASSESSMENT OF RECOMBINATION FREQUENCIES IN REGION ON HUMAN CHROMOSOME 13Q SURROUNDING GJB2
Mitchell Goheen
Category: Cell Biology, Genetics, and Genomics, Section 5
Poster: 112
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Ellen Wilch (Microbiology & Molecular Genetics)

Mutations in the gap junction GJB2 gene are frequently associated with non-syndromic hearing impairment (NSHI). The gene encodes the connexin 26 protein, which forms plasma membrane channels between cochlear cells. The 35delG mutation, which resulted from a frameshift-causing deletion of a guanine residue near the amino terminus of the gene product, is responsible for a majority of recessive NSHI in Caucasian populations. Analysis of SNP markers surrounding the GJB2 gene indicates that the mutation arose from a single mutational event on a founder chromosome. However, there is uncertainty surrounding the approximate age of 35delG. Information from the Human Genome Project suggests that this region may harbor a recombination island in that both Genethon and Marshfield genetic maps show a large discrepancy between genetic and physical distances for several alpha satellite markers (also called short tandem repeats [STRs]). After inspecting the recombination data from which these genetic distances were calculated, we discovered that the available data were inadequate for making any significant conclusions about local recombination rates. We identified nine STRs spanning a range of about 2.3 Mbp and including the GJB2 gene. Using polymerase chain reaction and high-throughput genotyping on the ABI PRISM® 3130 Genetic Analyzer, we obtained STR genotypes from three different large Michigan families of European descent to assess recombination rates in this region.

YOU ARE WHAT YOU EAT: HORIZONTAL GENE TRANFER IN EUNGLENOIDS
Bryan Lakey
Category: Cell Biology, Genetics, and Genomics, Section 5
Poster: 113
Location: Ballroom, 1:30 PM-3:30 PM
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) approximately 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. But, was this the first instance of endosymbiotic gene transfer (EGT) or horizontal gene transfer (HGT) in euglenoids? Almost a billion years exists between the appearance of red algal lineages and green algae. Did other endosymbiotic events, or gene transfers transpire before or after the establishment of the green chloroplast? My research shows that non-photosynthetic, housekeeping genes were also transferred to the nucleus from red or chromalveolate lineages. Using BLAST searches against our euglenoid EST database we have detected over 300 putative instances of gene transfer. The data for biotin synthase, glutamate tRNA synthase, and prolyl tRNA synthetase showed that genes have been acquired as a result of EGT/HGT and exemplify my findings for many of the 300 genes. This demonstrates that the euglenoid nuclear genome is a mosaic comprised of genes from the ancestral lineage plus genes transferred by EGT/HGT from green, red, and chromalveolate lineages.

INCONCLUSIVE DETECTION OF THE W1282X CF MUTATION IN IB3-1 CELLS USING A PCR DIAGNOSTIC ASSAY
Jesse Kato
Category: Cell Biology, Genetics, and Genomics, Section 5
Poster: 115
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Douglas Luckie (Physiology)

The cystic fibrosis transmembrane conductance regulator (CFTR) W1282X mutation is an extremely rare class 1 mutation associated with less than 2% of all cases worldwide (Shoshani et al, 1994). The W1282X nonsense mutation occurs on exon 23 base pair 3846 due to a single base pair substitution in the 1238th amino acid. A change from TGG, or tryptophan, to TAG, a stop codon, inhibits gene expression on the apical part of the epithelial cell (Dorfman et al, 2011). The aim of this PCR diagnostic assay was to successfully determine the presence of the W1282X nonsense mutation in samples of mutant DNA from CF patients' IB3-1 epithelial cells by replicating the assay in Perone's publication (Perone et al, 2010). PCR experiments using Enterobacterophage λ and Escherichia were controls for maintaining a functional experiment, as well as procedures for PCR cocktails and agarose gels. By utilizing PCR, it was hypothesized that when using the W1282X-M, published mutated

primer with IB3-1 cells, the W1282X nonsense mutation would be present (Perone et al, 2008). In this experiment, primers designed by Perone and his team were used to determine the presence of the W1282X mutation (Perone et al, 2010). The results obtained were inconclusive due to an error in running gel electrophoresis. The data from this experiment results in a better understanding of W1282X CF mutation and allows for newer models of research for this nonsense mutation (Shoshani et al., 1994).

COMMUNICATION ARTS & SCIENCES

ORAL PRESENTATIONS, SECTION 1

IDENTIFYING COMMUNICATION STRATEGIES FOR CONVEYING ENVIRONMENTAL INFORMATION
Becky McKendry
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 11:00 AM-11:15 AM
Mentor(s): David Poulson (Journalism)

Although the environment is the largest beat in journalism, environmental and science-based information can often be difficult to convey – which can ultimately lead to an inability to reach and resonate with the average (yet potential) news consumer. Using a functioning news outlet as a platform, there are strategies that have been identified which support the idea of promoting new consumers of environmental information. News outlets can redefine and broaden what an "environmental story" is, cover inclusionary topics directed towards underrepresented demographics and engage in unexpected ways to convey environmental information much more easily to a larger audience.

PARTISAN AND STRUCTURAL BALANCE IN NEWS COVERAGE OF THE 2012 PRESIDENTIAL ELECTION BY BROADCAST, CABLE AND PUBLIC NEWS NETWORKS
Cody Harrell, Amanda Chodnicki, Rachel Droze, Elizabeth LeCrone
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 11:15 AM-11:30 AM
Mentor(s): Fred Fico (Journalism), Geri Zeldes (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 potential to be the president of the United States of America has been continuously and thoroughly covered by media giants and local newsrooms. 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 following Labor Day 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. Two members of our team spent their fall semester identifying stories relevant to the 2012 presidential campaign across six national TV networks. Two students joined them in January to form a content analysis team. We meet weekly to discuss and refine variables to code, poking holes in a protocol developed over the last 14 years.

REVISITING VERGER'S DAHOMEY: A PHOTOGRAPHIC CONTRAST
Elizabeth Izzo, Dylan Sowle
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 11:30 AM-11:45 AM
Mentor(s): Darcy Greene (Journalism)

Revisiting Verger's Dahomey is a contrast between photos taken in the 1950s by Pierre Verger and photos taken in 2012 by MSU journalism professor Darcy Greene in a village in West Africa. We continued research that was done last year on the culture, customs and celebrations in Benin (formerly Dahomey), Africa by identifying new sources and translating texts to enhance the understanding of the concepts. In addition to research, Professor Greene included us in the preparation process for her exhibition at the MSU Museum. Part of this process involved design for an exhibition catalog, design for QR codes to supplement captions, design for an exhibition website, as well as the actual placement and order of photos on museum walls for the exhibit. Throughout the process, we had to keep in mind the storytelling aspect of the exhibit. We needed to tell Professor Greene's story, while maintaining the integrity of both her and Verger's images. This led us to make last minute changes to the catalog and physical exhibit. These changes, however, led us to experience and understand the thought process behind telling the best possible story.

A GAME OF INCHES: RESEARCHING THE POTENTIAL OF GOOGLE GLASS AND COLLEGE ATHLETICS
Derek Kim, Molly Mason
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 11:45 AM-12:00 PM
Mentor(s): Jen Ware (Journalism)

The goal of my research is to discover the potential impact of Google Glass in Michigan State University's college athletics. I will do this by giving coaches and athletes an opportunity to wear Google Glass during practices. The idea is that Google Glass will give them an entire new viewpoint in order to critique their skills and technique. I am hoping my research will show Michigan State Athletics the potential for a new piece of training equipment. Throughout my research, I have put Glass on athletes from many different sports and have found that it has a potential with almost all of them. The interviews I will conduct will be done, in-person, with the coaches from MSU. They will watch the footage taken from Glass and footage of their athletes wearing Glass. From there, I will show them Google Glass and get their initial response on this groundbreaking technology. I hope to have collected helpful evidence that shows the possible impact Google Glass could have on Michigan State Athletics.

CRISIS INTERVENTION: RAISING AWARENESS OF HELP FOR SURVIVORS OF SEXUAL ASSAULT
Anna Myers, Nolly Dakroury, Ian Siporin, Laura Swanson
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 12:00 PM-12:15 PM
Mentor(s): Bob Albers (Telecommunication, Information Studies & Media), Geri Zeldes (Journalism)

It is estimated that 1 in 5 college women are victims of sexual assault yet the vast majority of these assaults go unreported. Due to stigmas surrounding sexual assault and a lack of understanding in the general population, many victims stay silent either to avoid judgment of others or simply because they don't know where to turn for help. What many of these victims don't know is that there are resources available to help them. In this project, we will profile Michigan State University's Sexual Assault Crisis Intervention program to expose the largely unacknowledged community of people victimized by sexual assault and the advocates who work to help them through their crises. From the perspective of those who have dedicated themselves to helping sexual assault victims, we hope to bring awareness to the issue, as well as inform victims that resources are available to them.

MOLTEN LIGHT: THE INTERTWINED HISTORY OF STEEL AND PHOTOGRAPHY
Marisa Hamel, Jordan Jennings
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 12:15 PM-12:30 PM
Mentor(s): Howard Bossen (Journalism), Eric Freedman (Journalism)

Under the direction of Professors Howard Bossen and Eric Freedman, we delved into a photographic project rooted in the global history of the steel industry and its social and environmental effects. Molten Light: The Intertwined History of Steel and Photography consists of an exhibition, a book with the same title and a companion book, *Voices of Steel*. In collaboration with the Musée de la photographie in Belgium and The Westmoreland Museum of American Art, Greensburg, PA — places with strong history of steel communities — Professor Bossen is organizing the exhibition to open in early 2017. Molten Light includes photographs from the exhibition as well as essays that document steel workers throughout the world. *Voices of Steel* expounds on the same themes with quotes, commentaries and contributing essays by Bossen, Freedman, former research assistants, outside scholars and ourselves. We will write two essays for *Voices of Steel*. These chapters concern the relationship between steel and art, visually in sculpture, film and painting, as well as in the written word in poetry, drama, novels and songs. Our research includes searching for and interpreting authors' and artists' commentary on their steel–relevant work. Additionally, we engage in organizing a database of photographs and contact information, compiling and editing excerpts, quotes and references for *Voices of Steel*, and editing book proposals. We contact potential publishers, review submission guidelines, and use InDesign and Photoshop to format photographs for the checklist and proposals. Our roles in this project will carry us into the next academic year.

SOCIOMETRIC BADGES AS A MEASURING TOOL OF COMMUNICATION IN THE WORKPLACE
Kassia Salisbury
Category: Communication Arts and Sciences, Section 1
Location: MSU Room, 12:30 PM-12:45 PM
Mentor(s): Daniel Chaffin (Management)

Communication data gathering in the workplace is problematic due to the limits of current systems. Self-reports are popular but unreliable, as participants have trouble distinguishing between processes and outcomes, while video coding, although objective, is very costly. Wearable badges as a data gathering tool are an appealing alternative but need to be tested for data validity and reliability. In the Multiteam systems lab, communication data is collected through the use of Sociometric Badges. With built-in infrared, Bluetooth, and an accelerator Sociometric Badges can measure proximity, physical activity, speech activity, as well as many other indicators of communication. In the most recently completed stage of the Multiteam

systems lab's research, Sociometric Badges were distributed to members of the lab to test badge data validity. Badge data was compared against reliable self-report data. This served as a test run for deployment elsewhere.

POSTER PRESENTATIONS, SECTION 1

COMPUTER SECURITY: STORIES, ARTICLES, AND EDUCATION DOCUMENTS
Kathryn Hoban
Category: Communication Arts and Sciences, Section 1
Poster: 120
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Emilee Rader (Telecommunication, Information Studies & Media)

Computer users get their information on computer security from a wide variety of sources. In this study we examined three different sources of information available to users. We collected security advice from sources of varying levels of expertise: hearsay, newspapers, and educational documents. We are currently analyzing data from 301 local survey respondents, 1062 news articles from across the world, and 519 education documents from various universities, companies, and government institutions. This poster will showcase the topics, tactics, format, and user reaction to these sources and elaborate on the overarching themes among them.

COMPUTER SECURITY BEHAVIOR
Timothy Hasselbeck, Jallal Elhazzat
Category: Communication Arts and Sciences, Section 1
Poster: 121
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Emilee Rader (Telecom, Information Studies & Media), Kami Vaniea (Telecom, Information Studies & Media), Richard Wash (Journalism)

What security-related decisions does the average computer user make on a day-to-day basis? We are building a system that can gauge the adequacy of an average user's security habits and judge what factors influence a user's security behavior. Collecting accurate research data over such a broad scope is difficult to achieve, but collecting usable data is much harder. This difficulty stems from our concern for context. It isn't enough for us to learn that user A visited web-page B on browser C, or turned off her firewall at some point. We collect the information necessary to show how a user got to that web-page (through an email link, a search engine, a pop-up, an address bar) and under what circumstances a user disabled their firewall (was she connected to the internet, was she on a home network, was she in Starbucks). The end result of a user action is often easy enough for us to obtain. Our challenge lies in establishing context for each situation.

SOCIAL MEDIA CRISIS MANAGEMENT STRATEGIES IN RESPONSE TO POSITIVE/NEGATIVE PUBLICITY
Matthew Wigglesworth, Kevin Cunningham, Amanda Norris, Andrea Scherlinck, Kyle Thomas
Category: Communication Arts and Sciences, Section 1
Poster: 122
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Constantinos Coursaris (TISM), Wietske van Osch (TISM)

In this study, we engage in a two-part research design comparing significant events in two different platforms of communication: traditional and social media. Based on a quantitative content analysis of social media posts by nine brands over a six-week period, as well as a content analysis of traditional media articles over the same duration, we analyze and draw conclusions regarding the use of crisis management strategies by these brands as endorsed on their respective Facebook Pages and Twitter Feeds. The brands are classified within three categories: Airlines (Delta, KLM, and JetBlue), Big Box Retailers (Walmart and Target) and Consumer Packaged Goods (McDonald's, Starbucks, Coca-Cola, and Pepsi). These three categories of businesses were selected, because all three categories (Airlines, Consumer Packaged Goods, and Big Box Retailers) provide a business to consumer service and each possesses and provides fast moving goods (goods that are consumed within one year of purchase); also, all nine of these companies are active on social media in multiple channels, and have been referred to as reference cases. Results shown on the poster will report on how a brand's purchase involvement is associated with the crisis communication strategy of various companies. In doing so, we propose and use our "4A/O Crisis Communication Framework": The 4A Crisis Communication Framework addresses negative publicity by utilizing the strategies of Averting, Avoiding, Apologizing, and Acknowledging. Conversely, the 4O Crisis Communication Framework addresses positive publicity through strategies including Omit, Overlook, Own and Overstate.

ONLINE INFORMATION PRIVACY: UNDERSTANDING USER CONCERN AND BEHAVIOR
Paul Rose
Category: Communication Arts and Sciences, Section 1
Poster: 124
Location: Ballroom, 9:30 AM-11:30 AM

Mentor(s): Emilee Rader (Telecommunication, Information Studies and Media)

In a world that increasingly relies on the Internet, information privacy is a topic of concern for many. As people explore the Internet, their 'private' information and search behavior is constantly tracked and recorded by companies like Google and Facebook, often without the users' knowledge of it happening. People also face increasing risk of private information being visible through social media. Our research seeks to understand whether or not people are aware of these privacy issues, whether or not they are concerned about them, and why. To understand why, we analyzed survey responses in which participants answered open-ended questions about what made them concerned or not concerned for their privacy in various given scenarios. Specifically, we are looking at whether users think more about informational privacy, when companies and websites collect data, versus social privacy, when other people, friends, or employers see personal information. To do this, we devised a coding scheme to apply to all the survey responses. We also asked respondents how they would advise others in these various given scenarios. We plan to code these responses, and see how advice may interact with types of concern. Better understanding the way internet users understand and think about privacy issues will help us identify what actions and behaviors people consider to be intrusive versus harmless. It will also teach us how different sources of privacy concern affect level of concern and subsequent user behavior. This will help design better online systems while keeping users' private information safe.

THE EFFECT OF PROSODIC MANIPULATIONS ON NON-PROSODIC ASPECTS OF CHILDREN'S SPEECH
Kayla Tillman, Kathleen Moon, Stephanie Schmidt
Category: Communication Arts and Sciences, Section 1
Poster: 125
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Laura Dilley (Communicative Science and Disorders), Jessica Gamache (Linguistics and Languages)

As children's speech and language skills develop, their ability to convey information in speech through prosodic cues, such as pitch and timing, improves. Concurrent with this development is the gradual lowering of the pitch and formants in children's voices. Previous research has demonstrated that modifications to pitch and formants, which effectively change the perceived talkers' age, significantly alter judgments of speech (Dilley et al. 2013). However, the effects of changing pitch and formant have not been separated from one another. This study aims to dissociate the effects that changing pitch and formants have on listeners' perception of a talker and their speech. Five-year-old children's speech was manipulated via lowering, maintaining, or raising the pitch for the first experiment. Similarly, the same speech was separately manipulated via lowering, maintaining, or raising the formants for the second experiment. While acoustic-prosodic characteristics of the speech (fundamental frequency contour, speech rate, etc.) would be unmodified by these changes, it is predicted that the spectral modifications of both experiments would affect the perceptions of the speakers' ages in a similar manner. For these experiments, participants will judge the speech in terms of pitch, speech rate, fluency, and intelligibility. An expected similarity in the degree to which pitch and formant separately affect speech judgments would support the hypothesis that pitch and formant perceptions are equally integrated into the process of perceiving other aspects of the speech signal. Such a finding would have implications on clinical assessments of speech-language disorders, as well as developmental prosody research.

INDIVIDUAL DIFFERENCES IN THE PERCEPTION OF TEMPORAL INFORMATION IN SPEECH
Amanda DePelsMaeker, Mary Flynn, Elaine Foster
Category: Communication Arts and Sciences, Section 1
Poster: 126
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders), Tuuli Morrill (Communicative Sciences and Disorders)

Recent research has shown that speech rhythm and timing information, such as speech rate, can affect which words listeners hear (Dilley & Pitt, 2010). However, certain individuals seem less sensitive to this type of information than others. What are the underlying factors which lead to individual differences in the perception of temporal information in speech? Could the use of rhythmic information in speech be related to general non-speech rhythm perception? Investigations of certain language-related disorders, such as developmental dyslexia and stuttering, show connections to deficits in the processing of temporal information. In this study, we examined listeners' performance in a series of speech rhythm and timing perception tasks, as well as in a non-speech rhythm task. In these tasks, participants listened to sentences with different tonal patterns and sentences with different speech rates, then reported the words that they heard. In addition, they listened to rhythmic patterns and reported whether they perceived them as the same or different. Analyses were conducted to look for correlations in performance across the different tasks. Future research plans involve conducting the same set of tests on individuals with developmental dyslexia and stuttering. This will allow us to compare perceptual abilities related to timing information in speech and non-speech tasks across clinical and non-clinical populations, and has the potential to increase our understanding of certain language-related disorders.

STEREOTYPE THREAT AND ITS EFFECT ON FEMALE GAMERS
Max Reuter, Emily Glaser, Xintian Gu, Corrie Strayer, Jason Thompson
Category: Communication Arts and Sciences, Section 1
Poster: 127
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rabindra Ratan (Telecommunication, Information Studies and Media)

The representation of women in STEM fields as well as video gaming is far from equal to men, and research has yielded evidence that the reason for this is stereotype threat (ST). ST is caused by awareness of a negative stereotype against one's group, and causes anxiety in members of that group about possibly fulfilling the negative stereotype. This anxiety causes lowered performance in the stereotyped activity, and less interest in performing it. In the context of video games, we believe that telling female participants that they are playing a video game against a male is enough to trigger stereotype threat and lower performance in the game. Another possible prompt for ST is presenting participants with an article asserting the natural superiority of male gamers, which we predict will lower performance. We hypothesize that lower performance in the game will cause participants to show less interest in pursuing acceptance in other stereotypically-male areas, such as STEM field careers. In our experiment, the participants are female students at MSU who train in the first person shooter video game Unreal Tournament III, take a pretest survey, and read one article (either describing male superiority or gender equality in gaming). They then compete against a bot for ten minutes (being told they are playing against either a male or female student), and take a posttest survey. The data relevant to our analyses will be the participant's score, her initial attitude toward participating and succeeding STEM fields, and any change in that attitude.

POSTER PRESENTATIONS, SECTION 2

VOCAL VARIABILITY BETWEEN MORNING AND AFTERNOON
Helen Hou
Category: Communication Arts and Sciences, Section 2
Poster: 130
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Eric Hunter (Communicative Sciences & Disorders)

Acoustic metrics of voice and speech production are common in studies of Linguistics, Communication Disorders, Acoustic Forensics, Telecommunications, and others. Within these disciplines, understanding the normal variations of voice is needed. The primary purpose of this study is to observe differences in voice between morning and afternoon. Participants will be female Michigan State University students who are enrolled in the College of Communication Arts and Sciences. Each participant was recorded a total of six times- a morning and an afternoon recording each day- for three days spaced within two weeks. Recordings were made with both a microphone (for acoustic sounds) and an accelerometer on the neck (for voice only vibrations) while the participant completed a series of speaking and reading tasks. Some measures did not change morning to evening but there were some acoustic properties which showed significant change. These results will be used as a baseline measure and comparison in future studies.

THE EFFECT OF CLASSROOM AMPLIFICATION SYSTEMS ON TEACHER'S PERCEIVED VOICE ISSUES.
Lauren Glowski
Category: Communication Arts and Sciences, Section 2
Poster: 131
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Eric Hunter (Communicative Sciences and Disorders)

Purpose: School teachers are twice as likely to have a vocal injury over the general population. Voice issues in school teachers is estimated to cost the U.S. economy more than 2 billion USD annually (e.g. substitute costs, medical costs). The common practice for schools is to install voice amplification systems in the classroom. This study sought to gather information regarding symptoms of Vocal Fatigue and classroom amplification system use in elementary school teachers. Methodology: Using a self-report survey distributed online to teachers at two schools, one where such systems are available and one where they are not (Clarkston Elementary and DeWitt). The survey was presented via Qualtrics.com. Results: Responses were contrasted between the two schools and those who used microphones and those who did not. Additionally, the likability of the systems was noted as well as why some teachers did not use the amplification systems. Conclusion: While previous studies have noted that the use of microphones in classrooms significantly improves the symptoms of Vocal Fatigue, the respondents to our survey presented more insight on when, how and why a teacher may or may not use such a system. While implementing a microphone system would help to improve the physical toll taken by extended daily voice use, schools need to take into consideration how and if the systems are utilized so that the investment of resources is worthwhile.

BEHIND THE GREAT WALL FIREWALL: TRACING THE ROLE OF INTERNET LANGUAGE IN CULTURAL SHIFT IN CHINA
Tunan Guo, Yisi Fan
Category: Communication Arts and Sciences, Section 2
Poster: 132
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Steven Fraiberg (Writing, Rhetoric, and American Cultures)

China in the past thirty years is experiencing profound transformations in the economic, cultural, and linguistic landscape. Bound up in these wider social shifts is a burgeoning internet culture with now more than 600 million participants on the internet and social media sites. While heavily censored—or perhaps precisely because of these restrictions—the internet has given rise to a rich, coded language characterized by irony and satire as a way to resist dominant discourses and national narratives, as part of a process serving to restructure relationships between the government and people. While this phenomenon has been increasingly studied in the popular press and academic literature, less studied has been ways this language is becoming woven into the fabric of modern mainstream culture. Internet language has become multifunctional—and multimodal (adopting a range of semiotic systems)—and increasingly serves as a lens mediating the reconstruction of identities and social structures: e.g., materialism, gender, popular culture, and other societal issues. To map of this process, this six-month study examines Chinese internet culture through sampling of a broad range of social media sites and practices drawing on a grounded theory framework. As part of this work, we are conducting thematic analyses and coding data to identify key themes and issues, which will be presented and linked to the wider research questions.

A SCIENTOMETRIC ANALYSIS OF BIG DATA: QUANTIFYING AND QUALIFYING THE DOMAIN
Sean Miller, Sarah Mackenzie, Monica Mikhael, Ervin Novas, Elizabeth Vandenbil
Category: Communication Arts and Sciences, Section 2
Poster: 133
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Constantinos Coursaris (Telecommunication, Information Studies and Media), Wietske van Osch (Telecommunication, Information Studies and Media)

To better understand the rapidly growing big data research domain, this study presents the findings of a scientometric and bibliometric analysis of the corresponding literature. We conducted a research productivity analysis and citation analysis of individuals, institutions, and countries based on 500 peer-reviewed big data articles published in journals and conference proceedings between 2001 and 2013. Results speak to the most common and popular cited works and studies conducted by scholars, as well as identifying which authors in particular have been prevalent in productive research and studies within the past twelve years.

AVATAR CONNECTIONS: HOW ACTION IDENTIFICATION THEORY IMPACTS ATTITUDES TOWARDS EXERCISE.
Shaurya Srivastava, James Chirackal, Nhung Doan, Ciara Johnson, Grant Kunzelman
Category: Communication Arts and Sciences, Section 2
Poster: 134
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rabindra Ratan (Telecommunication, Information Studies and Media)

Action identification theory is concerned with how people think about the actions they conduct. Actions can be categorized according to different levels such as low level and high level thinking. Low level thinking is concerned with how an action is done, while high level thinking is concerned with consequences of doing an action. According to the theory, people usually identify with high level thinking, however, the theory also states that if people's perceptions on low level thinking are changed in some way, then this could also change their views toward high level thinking. In our study we decided to link the effects of Action identification theory to people's attitudes toward exercise. To do this we had participants play a videogame called "London Olympics" on the Xbox 360. Participants were randomly assigned to either a "gesture" (low level thinking) condition in which they would play the game using the Kinect motion sensor, or a "keypad" (high level thinking) condition in which the participant would use a regular Xbox controller. Participants were then assigned to play three sports events in a random order, and afterwards answered surveys about their experiences. Each of these surveys would ask participants how closely they connected with the avatar that was present in each sport event. One week later participants took another survey on their attitudes towards exercise. It is our hypothesis that participants in the gesture condition who closely connected with their avatars will show the greatest change in attitude towards exercise after one week.

CAN DANCING WITH A VIRTUAL-AGENT IN A VIDEO GAME REDUCE RACIAL PREJUDICE?
Benedict Hilado, Peter Burroughs, Annette Kim, Tyler Powers, Justin Tokarski
Category: Communication Arts and Sciences, Section 2
Poster: 135
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rabindra Ratan (Telecommunication, Information Studies and Media)

The purpose of this study is to see if characters in a video game, a type of virtual-agent, can be used to reduce racial prejudice among individuals. According to social identity theory, self-categorization and group membership create interactions that favor ingroup members at the expense of outgroup members. Individuals treat members of their ingroup better than individuals associated with an outgroup. According to the Proteus Effect, identity with and the perceived presence of a virtual-agent can influence individual behaviors. Based on a review of literature it is hypothesized that identification and perceived presence of a virtual-agent will be moderated by the level of social-identity an individual has with their racial ingroup. We argue perception of virtual-agents as ingroup members is mediated by the represented race of that agent and whether or not the participant dances to music that affirms the racial stereotype of that agent and that the level in which the individual perceives the virtual-agent as a member of their ingroup interacts with their level of implicit racism towards outgroup members. A 2 (Caucasian/Black) x 2 (hip-hop/pop-music) experimental design with a target sample size of 128 participants will be used to test for potential effects. Participants will be randomly assigned to one of four experimental conditions in which they will model dance moves of a virtual character of a specific race while dancing to music that affirms or disaffirms racial stereotypes. The video game Dance Central 3 for the Xbox 360 Kinect will be used as the experimental manipulation.

DIGITAL MEDIA

ORAL PRESENTATIONS, SECTION 1

WATERCOOLER WARFARE EXTREME
Peter Burroughs, Scott Binter, Aaron Ta, Frank Wittenberg
Category: Digital Media, Section 1
Location: Lake Ontario Room, 9:00 AM-9:15 AM
Mentor(s): Brian Winn (Telecommunication, Information Studies and Media)

Watercooler Warfare Extreme is a 2D fighting video game inspired by games such as Mortal Kombat and Castle Crashers. It is intended to be an introductory project in the use of the Unity Game Engine and team collaboration. The team is composed of new members in the Communication Arts GEL Lab, the Games for Entertainment and Learning Lab at Michigan State University. Valuable experience was gained in the fields of art, programming, and creative design. This experience will be used for the creation of games for entertainment and learning in the future. The artists geared their focus towards 2D art and character models in Adobe Illustrator and 2D rigging and animation in Autodesk Maya. On the programming side, several small scale examples of industry level techniques such as polymorphism and finite state machines were implemented in the coding of the game. The entirety of the game was programmed in C# and utilized graphical user interfaces. The game underwent several stages in design, from conceptualization to the finished product. Each member learned to delegate tasks, prioritize game mechanics, and establish reasonable deadlines. It is the team's hope that this game is enjoyable and was successful in teaching good game design concepts.

SPARE PARTS: HUMAN ORGAN TRAFFICKING IN BANGLADESH
Kirk Mason
Category: Digital Media, Section 1
Location: Lake Ontario Room, 9:15 AM-9:30 AM
Mentor(s): Sue Carter (Journalism), Troy Hale (Telecommunication, Information Studies and Media)

"Spare Parts: Human Organ Trafficking in Bangladesh" is a feature-length documentary film that follows people in Bangladesh who decided to sell their kidneys and other organs to help pay back loans. After the removal of the organs, they are still waiting for the broker to pay them. In the meantime, the health of these victims has deteriorated, and has pushed them into incredible debt. Human organ trafficking is a serious a problem in Bangladesh. Many in developed countries have no knowledge that the problem exists. We are teaming up with MSU assistant Professor Monir Moniruzzaman to tackle this story about the people affected by this terrible practice. Dr. Moniruzzaman devoted the last 12 years to documenting the underworld of kidney and liver harvesting in his homeland, where he has met dozens of players – surgeons, physicians, organ brokers, wealthy organ recipients and impoverished organ sellers. His dissertation, Living Cadavers in Bangladesh: Ethics of the Human Organ Bazaar and his more recent research, places Dr. Moniruzzaman as an international expert in this field, casting a spotlight on MSU and giving us a unique opportunity to cover this subject that is simultaneously horrifying and heartbreaking. Dr. Moniruzzaman testified in 2012 in front of the U.S. Congress Human Rights Commission and the U.S. Senate Foreign Relations Committee to share his fieldwork and to shed light on organ trafficking. Our documentary promises a lengthier look at Bangladesh and its residents who resort to selling their organs to survive.

BEYOND "THE PRINCESS IS IN ANOTHER CASTLE": THE ASPECTS OF GENRE AND NARRATIVE IN VIDEOGAMES
George Quimby
Category: Digital Media, Section 1
Location: Lake Ontario Room, 9:30 AM-9:45 AM
Mentor(s): Ann Larabee (English)

Videogames have grown into one of the most powerful forms of cultural entertainment in the last decade, as games such as Grand Theft Auto and Call of Duty have each sold 1 billion dollars in their opening weekend. Despite massive sales numbers and growing narrative depth, videogames have little to no representation in academic scholarship. Research into videogames as a narrative yielded few results. As such, research in this field is mostly through primary source material using tools of analysis found in the humanities. This presentation will look at the different genres of videogames and how their individual rules of presentation affect narrative structure and the violence expected in the medium. Particular attention will be paid to how camera style, control and awareness of the player are all key to setting the tone of game. The other focus will be consistent narrative tools and tropes, especially the "How or Why" question regarding videogames in military settings and consistent enemy ethnicities and characteristics. By surveying dozens of games across the last fifteen years of production I have identified reoccurring aspects in various genres. By no means will this presentation be a definitive list of genre tropes, but it will effectively cover the major tropes indicative to a genre. This presentation looks to prove that any research into videogames must bear in mind the aspects of genre first.

FISSION
Garrett Jafano
Category: Digital Media, Section 1
Location: Lake Ontario Room, 9:45 AM-10:00 AM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies and Media)

"Fission" is a short film that briefs upon the human nature of discrimination in a science fiction setting where some of the population have developed animal-like features and abilities. A police officer with a deep discriminatory hate for these "Creatures", takes out his anger on any one that he sees. The film takes a further look on how discrimination from figures of law enforcement officer can cause victims to actually look to crime instead of avoiding it. "Fission" is a special effects and action driven project made completely using students at MSU. I took on all aspects of the project from writing, pre-production, casting, directing, editing, effects, and more. This project is a great example of what the CAS College can teach students looking to go into any aspect of film.

MSU EATS TODAY
Heidi FluckMegan Haugh, Racheal Kneebone, Abigail Whitford
Category: Digital Media, Section 1
Location: Lake Ontario Room, 10:00 AM-10:15 AM
Mentor(s): Bonnie Bucqueroux (Journalism)

This Honors College initiative uses multimedia to tell the story of food on the Michigan State University campus. The two teams each produced a YouTube documentary on an aspect of food at MSU. Participants also did a video of an individual family recipe and an individual project, as well as frequent posts through the Wordpress website.

DETROIT@MSU
Neena Rouhani
Category: Digital Media, Section 1
Location: Lake Ontario Room, 10:15 AM-10:30 AM
Mentor(s): Bonnie Bucqueroux (Journalism)

Michigan State University welcomes thousands of diverse students from Detroit to campus each year. Detroit remains the largest city in the state, with a unique history and this project explores how Detroiters become Spartans. The research conducted includes interviews with a diverse group of current MSU students who are also Detroit natives. The topics addressed include their communities prior to coming to MSU, their transition to the school, whether or not they feel like a part of the MSU family, as well as their perspective on the multi-culturalism or the lack thereof at this institution. We compiled our information onto a website created to showcase the ever-growing culture of Detroiters at MSU.

FOCAL POINT TV NEWS
Daniel Hamburg
Category: Digital Media, Section 1
Location: Lake Ontario Room, 10:30 AM-10:45 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 and troubleshooting technical problems

and helping edit in Avid Media Composer. 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.

'A PUBLIC AFFAIR' STUDENT FILM
Dean Feole
Category: Digital Media, Section 1
Location: Lake Ontario Room, 10:45 AM-11:00 AM
Mentor(s): Bob Albers (Telecommunications), Pete Johnston (English), Jeff Wray (English)

Students of the Fiction Film Production Specialization come together to fill all the various roles of pre-production, principle photography and post-production to create their own short film. This year's film, 'A Public Affair', follows a frustrated young man as he combats the duality of existing in his bland office life, his grungy sex life and his romantic fantasy life all at the same time. Course administered co-departmental through English and Telecommunications by Bob Albers, Jeff Wray and Pete Johnston. Presentation by student producer Dean Feole.

ORAL PRESENTATIONS, SECTION 2

THE LIVING HISTORY PROJECT: STORIES TOLD BY MICHIGAN'S OLDEST OLD
Andrea Raby, Tiara Marocco, Anna Shaffer, Bhavya Thamman
Category: Digital Media, Section 2
Location: Lake Ontario Room, 1:00 PM-1:15 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.

FOOTBALL TAILGATING: WHERE MICHIGANDERS LOVE TO GATHER
Alexandra Tekip
Category: Digital Media, Section 2
Location: Lake Ontario Room, 1:15 PM-1:30 PM
Mentor(s): Sue Carter (Journalism)

"Football Tailgating: Where Michiganders Love to Gather" combines film and digital elements to provide a comprehensive analysis of traditions of football tailgating at various colleges and universities in Michigan, emphasizing the idea of unity and camaraderie that has become an integral part of the tailgating culture. Particular areas of focus include: school location, population and athletic prominence, school-specific history and tradition and types of food, tailgate games, etc. Our team filmed interviews with tailgating fans and individuals involved with athletic administration during the 2012 college football season, targeting contests between Michigan State and the University of Michigan, Central Michigan and Western Michigan, Grand Valley and Ferris State, Saginaw Valley and Wayne State and Kalamazoo College and Alma College. Research methods such as archiving through newspapers, yearbooks, documents, photographs, etc. and direct communication via email and/or phone were used to discover images, documents (i.e. rules and regulations) and articles that helped to shape each university's tailgating culture. The half-hour film is set to premiere on PBS following its completion. In addition, our team reached out to a web design class to create Tailgate USA, a website that highlights tailgating in Michigan and provides visitors with tailgate recopies to try.

"ART OF ART" DOCUMENTARY
Heather Hartmann, Jack Burk, Alex Hennessy, Sarah Hopkins, DeShaun Leonard, Spencer Taylor
Category: Digital Media, Section 2
Location: Lake Ontario Room, 1:30 PM-1:45 PM
Mentor(s): Bob Albers (Telecommunication, Information Studies and Media), Geri Zeldes (School of Journalism)

Often, people simply look at a piece of art or listen to a song or watch a film, and then they move on. Most don't ask what went into the work or how it came to be; it just is. However, even art has a beginning and a process and a life. In the documentary, we explore the creative process of various artists and how their art comes to be, from first thought to the final product. Like the world of art, the Michigan artists in the film are quite diverse: a glass blower, a fiber artist, a painter/actor, and a scrap artist. Following each as they brainstorm, mold, and reveal their final product, the documentary hopes to shed light on a variety of artistic creative processes, as well as show art goes beyond just the end product. Even more startling is

that this documentary on the creative process is a work of art itself. Grown from the minds of Michigan State students who gathered various artists of diverse backgrounds and disciplines, the film is considered organic and inspirational. It can even be viewed as its own showcase of the creative process. The hopes for the film are simple: to reveal the beautiful and wondrous creative process, to inspire people to look beyond the art hanging on the wall, and to reveal the art of art.

"WHO SAYS THERE IS NO MUSIC SCENE IN LANSING?"
Amy Ashley
Category: Digital Media, Section 2
Location: Lake Ontario Room, 1:45 PM-2:00 PM
Mentor(s): Jon Ritz (Unit: Writing, Rhetoric & American Culture)

Abstract: In 2010 a nonprofit organization called Middle of the Mitten (MotM) was founded to help support the local music community in the Lansing area, understanding that a thriving local music scene is a vital part of Lansing's emerging creative class culture. At times it may seem as if the music scene in the area is long gone, but in my research, over the past two years, I've found our music scene alive and well. I will present a video which includes video interviews, live shows, and photographs that highlight a culture many feel doesn't exist. So who says there's no music scene in Lansing? I invite you to come see for yourself.

IN THE MOMENT
Izak Gracy, Travis Root
Category: Digital Media, Section 2
Location: Lake Ontario Room, 2:00 PM-2:15 PM
Mentor(s): Robert Albers (Media Sandbox)

In the Moment is a documentary about being "in the zone." From prima ballerinas to professional yo yo tricksters to military snipers, The Moment documentary has a range of interesting characters. Each one talks about how they get in the zone and why they keep going back for more.

EXPLORING THE PRACTICE OF WORSHIP AND GLORIFICATION THROUGH IDEOLOGIES
Jennifer Berggren
Category: Digital Media, Section 2
Location: Lake Ontario Room, 2:15 PM-2:30 PM
Mentor(s): Amol Pavangadkar (Telecommunication, Information Studies and Media)

People all over the world are divided. Humans, with every reason to come together, who have the same interests and passions; men and women with similar core values. They find themselves never crossing paths during their lives on this earth together. We are separated for the rest of our lives because of one dividing factor: religion. These belief systems, however dividing, all feature a culmination of values and beliefs into a type of ritual. Some call this apex “worship,” others refer to it as prayer or they integrate it into their daily life. This process, no matter the person, works to uplift and glorify what is at the center of their religion. At the core of the film, we are seeking out a common denominator. Religion has worked to bring similar people together for centuries, but has separated the ones who believe differently, or don’t believe at all. This film explores those differences. It looks into the way that traditional worship and prayer within religions may be more similar than our divided lives may lead to believe. Currently, we are exploring these ideologies: Islam, Hinduism, Buddhism, Atheism, and Christianity. By taking a closer look, we believe that at the core, these rituals look more similar than thought; we find that human nature, and our common values and ideologies will arise to bring people together despite doctrinal and fundamental differences.

I WANT TO BE DIFFERENT...
Jonathan Trites
Category: Digital Media, Section 2
Location: Lake Ontario Room, 2:30 PM-2:45 PM
Mentor(s): Henry Brimmer (Advertising)

This video documents the progression of MSU's Professor Henry Brimmer as he creates and enters an art piece into the Grand Rapids Art Prize contest. The program is an exploration into stylistic storytelling, consisting of footage and interviews shot during the event.

EDUCATION

POSTER PRESENTATIONS, SECTION 1

EXAMINING NEW LENA TECHNOLOGY
Benjamin Brandicourt
Category: Education, Section 1
Poster: 140
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Joshua Plavnick (Counseling, Educational Psychology and Special Education)

This project is designed to assess the usefulness of a new type of technology in the field of child psychology. It is known that the language environment in which children are raised is crucial to early childhood language environment, but the current methods of data collection in this field are tedious and often unreliable. The LENA (Language ENvironment Analysis) device is a new and exciting tool that could streamline research in child language environments. The device is small, and worn on a child's clothing for an entire day. It records all noise around the child, which can be played back at leisure. The device is paired with a computer program that can tally the amount of utterances by the target child, the amount of utterances by other children, and the amounts of utterances by surrounding male and female adults. In addition to this quantitative analysis, the device can track the number of conversational turns between the target child and surrounding individuals, an important statistic when tracking the child's development. In this study, we will collect LENA data for a few children over a period of a few months, and we will compile a variety of data. We will then examine the reliability and ease of this data collection, and decide whether the new technology will substantially expedite data collection for future studies, while still remaining as reliable and accurate as manual coding of live recordings.

EXPLORING BEHAVIORAL RISK AND PROTECTIVE FACTORS IN AT-RISK PRESCHOOLERS
Brette Smith, Keegan Johnson, Caitlin Lacey
Category: Education, Section 1
Poster: 141
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): John Carlson (Counseling, Educational Psychology and Special Education), Allison Siroky (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 a part of enrollment materials from over 1,364 parents of children participating in Head Start during the 2013-2014 academic year with an average age of 49.6 months. Through an analysis of this data, we will 1) describe how the typical Head Start preschooler, who is at risk for externalizing behavioral problems, scores on a parent-rated measure of risk and protective factors, 2) compare these scores to data reported from the standardization sample as reported in the manual, and 3) investigate the differences in risk and protective factor prevalence rates within this Head Start population compared to data obtained from the normative sample. This poster benefits educators, psychologists, and Head Start facilitators by providing information about trends of incoming children, which are important in highlighting areas in which children need support. Findings may also serve as a guide for early intervention by illuminating not only the child's weaknesses, but strengths as well. This creates a foundation for educators, psychologists, and Head Start facilitators to build off of and continue to generate positive habits.

DIFFERENCES IN STUDENT REASONING ABOUT CHEMICAL ENERGY CONCEPTS USING STATIC AND INTERACTIVE VISUAL REPRESENTATIONS OF INTERATOMIC POTENTIAL ENERGY DIAGRAMS
Zachary Nusbaum, Keenan Noyes
Category: Education, Section 1
Poster: 142
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Sarah Jardeleza (Center for Integrative Studies in General Science), James Laverty (CREATE for STEM Institute)

One of the fundamental core concepts taught in introductory chemistry courses is energy. Understanding how energy relates to chemistry is key to the understanding of atomic interactions, which is vital to progress in the field. Furthermore, energy is also present in other fields of science, providing cross-discipline education opportunities, a core goal of the newly developed Next Generation Science Standards for K-12 education. Research identifies that understanding energy in a chemical context can be very challenging for students. The use of visuals can sometimes provide different insights into difficult concepts making them easier to understand. In particular, we are interested in the use of different types of visual representations to aid in the understanding of chemical concepts, specifically chemical energy. To explore possible learning differences in the use of static and interactive representations, we have constructed a survey to assess student understanding of key chemical energy concepts using static and interactive versions of an interatomic potential energy diagram. The results of this survey

provide insights into how students use static and interactive visual representations to reason their understanding of chemical energy concepts.

MORE THAN JUST PRACTICING SKILLS: EMOTIONAL ENGAGEMENT IN MIDDLE SCHOOL MATHEMATICS
Alexandra Sanchez
Category: Education, Section 1
Poster: 144
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Kristen Bieda (Teacher Education)

The word "math" evokes strong, often negative, reactions. As a future teacher, I want my students to feel positively about math, and school in general. Existing literature documents several key factors determining emotional engagement in school, including relationships with parents, peers, and teachers, after school programs, and feelings during and beliefs about school. In this study, I investigated how these factors determine students' emotional engagement in mathematics. I collected survey data and conducted interviews with seventh grade math students in two classrooms at different schools. Participants completed the surveys, ranking their level of emotional engagement on a scale of 1 to 4, after a total of 12 to 15 math class sessions during the fall 2013 semester. I also interviewed four students from each classroom- two from each that had consistently low levels and two with high levels of emotional engagement in their survey responses. The surveys showed, somewhat surprisingly, that students tended to remain at consistent levels of emotional engagement throughout the semester. The formal interviews revealed that students' emotional engagement related to the factors the literature had suggested, such as relationships with others. My presentation will reflect on some of the differences found among the students who had different levels of emotional engagement and will suggest possible actions to improve emotional engagement in mathematics for all students.

EXPLORING MEANINGFUL LITERACY PRACTICES IN A DETROIT AFTER-SCHOOL PROGRAM
Erin Novelly, Katie Dennis
Category: Education, Section 1
Poster: 145
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Susan Florio-Ruane (Teacher Education)

This undergraduate research project involves the relationship and partnership between Michigan State University educational researchers with an inner city after school program, Racquet Up Detroit, to study the literacy learning and development of the middle school students. The purpose of this research is to study how different literacy practices, learning tools, and book choices have made an impact on the literacy development of the program's students. MSU and RUD share a partnership and focus on the literacy development of 40 eighth graders from one neighborhood and two different schools in the northwest Detroit area. These students joined RUD as fifth graders and participate in the program through high school. This research project involves the analysis of student interviews, data collection from RUD teaching experiences from summer 2013, and observations of the middle school students from summer 2013. The undergraduate researchers were able to participate in two summer camp programs hosted by RUD. The first camp involved the teaching of new technologies to the students who participated. The research assistants taught and led book discussions revolving around the text, *Gathering Blue*, by Lois Lowry. In the second camp the research assistants planned a literacy curriculum around the text, *Stuck in Neutral* by Terry Trueman. This project will focus on the story and analysis of the teaching and implementation of these two separate texts and analyze the students' response to each text, literacy practices used, in-depth book research, and the learning outcomes found.

IDENTITY WITHIN OUR SCHOOLS
Samantha Evans
Category: Education, Section 1
Poster: 146
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Peter De Costa (Linguistics and Germanic, Slavic, Asian, and African Languages)

In the United States, schools are recognized to develop students who have a variety of skills, talents, and dispositions. One fundamental feature of the K-12 school system is its ability to recognize and build on the personal identities of students and the funds of knowledge (Gonzalez, Moll & Amanti, 2005) that they bring to schools. Importantly, recognizing the individual differences among students and validating their respective identities facilitates student learning and supports their academic socialization (Duff, 2013). Along with student identity, teacher identity is also important. Teacher identity is constructed in relation to students as well as the norms of the school environment and the school community. My poster presentation will examine teacher and student identity formation and how it intersects with a host of individual differences such as student learning styles, motivation, socioeconomic status, and heritage.

POSTER PRESENTATIONS, SECTION 2

EXAMINING THE IMPACT OF QUESTION SURFACE FEATURES ON STUDENTS' ANSWERS TO CONSTRUCTED RESPONSE QUESTIONS IN BIOLOGY
Michele Weston
Category: Education, Section 2
Poster: 149
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Mark Urban-Lurain (Center for Engineering Education Research)

One challenge in science education is that students often focus on surface features of phenomena rather than the underlying scientific principles. In this project we investigated how student written responses to constructed response questions about photosynthesis vary based on surface features: the species of plant and the order of two question prompts. In order to test this, we asked four different versions of the question with different combinations of the two plant species and order of prompts in an introductory biology course at a large Midwestern university. We found that there was not a significant difference in the content of student responses to versions of the question stem with different species or order of prompts, as determined by computerized lexical analysis. We conducted twenty face-to-face interviews with students to further probe the effects of question wording on student responses. During the interviews, we found that students thought that the plant species was neither important nor confusing to them when answering the question. They identified the prompts as both important and confusing. However, this confusion did not impact the content of their written responses. Our findings show that surface features of these questions do not impact students' responses. Finally, students found the prompts more important than the plant species, but they were also more likely to be confused by the prompts. This implies that question writers should pay close attention to the clarity of question prompts because students are likely to be confused about what the prompts are asking.

FIRST YEAR WRITING CONFERENCE
Cheryl Mitchell, Andrea Jeannotte
Category: Education, Section 2
Poster: 150
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Joyce Meier (Writing, Rhetoric & American Cultures)

Analyzing the outcomes of the First Year Writing Conference at Michigan State University and the effects of its work on current and prospective students, our work intends to showcase pieces created by First Year Writing students to community members. With this, we also aim to provide another source of comprehension of the meaning of "college writing" to local high school students as well as fellow peers within the program. Through presentations, interviews and workshops the committee will display the significance of other forms of educational experiences outside of the standardized, generic classroom setting. While celebrating the work of these undergraduates, the conference aims to provide information and activities to local high schools to help better prepare and broaden the mindsets of both teachers and students regarding college level writing.

THE EVOLUTION OF DINOSAUR EXTINCTION THEORIES
Caitlin O'Neill
Category: Education, Section 2
Poster: 151
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Danita Brandt (Geological Sciences)

I will compile a bibliography of popular books, articles, and other resources focused on dinosaur extinction- both past and present. I will research the various hypotheses and temporal shifts in prevailing paradigms used to explain the cause of extinction and reflect on how they have changed over time, why and under what circumstances they have changed, and what these changes imply for the future. Children grow into the next generation of scientists and researchers, and it is important to recognize that the understanding they are supplied with will impact the future of their studies and beliefs.

DOES RELIGION AND EDUCATION BACKGROUND AFFECT STUDENT PERCEPTIONS OF EVOLUTION?
Lazarius Miller
Category: Education, Section 2
Poster: 152
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Louise Mead (BEACON)

Evolution is the study of changes in the heritable traits of a population of organisms as successive generations replace one another. It would be beneficial to study evolution because the world and its inhabitants are always changing, where

developments in new biological phenomena continue to emerge such as antibiotic resistance and inheritance of genetic diseases. The general attitude towards science careers in the United States is positive, however many students in elementary through high school are not performing at higher levels of critical thinking. Research suggest high school students are not being sufficiently prepared to perform well in areas of critical thinking. Assessing if religious orientation is a dependent variable on educational perspectives will help determine a baseline for why some students are more receptive to evolutionary theories. This study will examine the relationships between student attitudes towards science and evolution as a function of religious beliefs and the access to supplemental education resources.

STUDENT VISUALIZATIONS OF VARIATION IN POPULATIONS
Anthony Machniak
Category: Education, Section 2
Poster: 153
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Tammy Long (Plant Biology)

Biology is a field that has intense cognitive demands on its students. Students are forced to conceptualize a system that works on multiple scales over various amounts of time. One core idea in biology is how variation originates in a species. The system involves a microscopic understanding of how DNA, genes, protein, and chromosomes interact, but at the same time requires students to show how those micro-structures create what is seen on the larger scale in phenotypes. Those phenotypes are then subject to phenomenon such as natural selection and competition for resources. Students are rarely asked to draw what these structures look like on assessments, but are frequently asked to either write or pick from multiple choices what the correct answer is. To compare how student written explanations are related to what they are visualizing, we gave high school and college students enrolled in various biology classes a survey that asked them to define, provide the function, and draw: DNA, genes, protein, chromosomes, phenotypes, and mutations. Grounded coding theory was used to create a rubric of trends in explanations and visualizations. We observed that definitions and explanations of functions include how the term structurally relates to another term, with some explanations including a mechanism of what the term does. We also observed that most students can provide definitions but have trouble visualizing what a gene, allele, or protein look like. Additional patterns between responses and the strength of trends are also being evaluated.

GAME-BASED APPROACH TO TEACHING GENETICS CONCEPTS
Irene Li, Megan O'Hara, Sarah Thorwall
Category: Education, Section 2
Poster: 154
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jeanette McGuire (Zoology)

Having a thorough understanding of genetics is critical within many disciplines and also promotes general scientific literacy. However, many genetics concepts are abstract and difficult for students to grasp from a traditional lecture format, especially for beginners in the field. One concept that is particularly vexing is gene regulation and expression. We developed a card game that uses the bacterial lac operon as a model to make this complex process more accessible to students. Our game emphasizes direct student involvement and problem solving strategies, requiring students to utilize critical thinking and cooperate to win the game. Game systems are arguably more enjoyable than a traditional approach and can help to retain attention by promoting direct student engagement in the material. The use of a game platform also facilitates three key components: 1) mastery of the fundamentals of the concept; 2) prediction of how the components would interplay; and 3) manipulation of the subcomponents to direct a desired outcome. As each individual masters the components, they strengthen their understanding of the concepts and demonstrate potential laboratory research-based applications to other systems beyond the lac operon. We are planning to test the effectiveness of our teaching tool in the context of an undergraduate introductory genetics course during Spring semester 2014.

UNDERSTANDING HOW STUDENTS COGNITIVELY APPROACH BIOLOGICAL SCIENCE THROUGH SYSTEM MODELS
Etiowo Usoro
Category: Education, Section 2
Poster: 155
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Tammy Long (Plant Biology)

When teaching Biological Sciences, instructors challenge students to understand how systems function in a cohesive manner, as opposed to operating in isolation. System models are a method of displaying how different systems work together, and these models can be used to provide feedback about student learning. In system models, concepts are represented in boxes linked by arrows that explain their relationships to one another. An important question for instructors to ask is whether or not these system models reflect what students are thinking. To answer this question, students in a Biological Science course were asked to explain a specific system in the form of an essay as well as a system model. An essay question is a format that students are accustomed to seeing throughout their educational careers, whereas a system model is a format that has been

newly introduced to students in this Biological Science course. Through various types of analyses, the similarities and differences between the two formats will be examined in order to give an indication of how students are cognitively evaluating scientific processes. We expect that the results of this research will help guide educators looking to use models as a resource to improve learning in the classroom.

ASSESSING STRENGTHS, WEAKNESS, OPPORTUNITIES AND THREATS OF A NEWLY DEVELOPED ONLINE BACHELORS' DEGREE IN EARLY CHILDHOOD EDUCATION
Zhechao Ma
Category: Education, Section 2
Poster: 156
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Hope Gerde (Human Ecology)

In preparation for launching a new online bachelor's degree in Early Childhood Education (ECE) at MSU, I engaged in a critical Strength, Weakness, Opportunity and Threat (SWOT) analysis to identify the potential viability of the program and to inform final design decisions. The SWOT report examined the quality of the new program and the efficacy of the business model then, compared these data to all existing online ECE bachelor's programs. Research questions: What is the quality of the proposed program in relation to currently available programs? What is the financial viability of the proposed program compared to current offerings elsewhere? To conduct the SWOT analysis, a set of quality parameters were identified. Comparison programs were identified and program component/quality data was gathered via exhaustive websearch and contacting program faculty. Using the business and program development plans for the new ECE program, SWOT criteria for the new program were identified. I compared the expected data of the new ECE program with other existing ECE programs. Results identified strengths in curriculum quality, unique delivery model, and student advising. However, course instructors lacked online experience and tuition pricing needed modification. Also, the service-delivery model can be easily replicated and the target population is primed for participation. Critically, the program must invest in marketing/advertising. The SWOT analysis informed revisions to the new ECE program and business plan. These steps will better position the new ECE program in the current market by promoting strengths and opportunities and addressing weaknesses and potential threats.

ENGINEERING, COMPUTER SCIENCE, & MATHEMATICS

POSTER PRESENTATIONS, SECTION 1

HARDNESS, FRACTURE TOUGHNESS AND ENVIRONMENTALLY-ASSISTED CRACK GROWTH IN MG-SI-SN THERMOELECTRIC COMPOUNDS AS A FUNCTION OF COMPOSITION
Miguel Angel Valdes Tabernero
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 160
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Eldon Case (Chemical Engineering and Materials Science)

Energy use and conservation is an extremely important topic in the world today. Thermoelectric materials, which convert waste heat directly into electricity, can play an important role in optimizing the energy efficiency of many processes, including internal combustion for automobiles. Thermoelectrics for waste heat harvesting undergo thermal fatigue as engines heat up and cool down, and this thermal fatigue induces mechanical stresses in the materials. Thus, mechanical properties of thermoelectric materials are important when thermoelectric generators are manufactured. Also, the cutting or grinding of thermoelectric materials during the manufacture of thermoelectric generators can induce cracks which are susceptible to growth in environments that contain water or water vapor. Therefore, prior to assembling thermoelectric generators, it is important to study the nature of environmentally assisted crack growth in thermoelectric materials such as Mg-Si-Sn.

HARDNESS, TOUGHNESS, AND SUB-CRITICAL CRACK GROWTH IN REPROCESSED BARIUM FILLED SKUDDERUDITE
Alex Zettler
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 161
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Eldon Case (Chemical Engineering and Materials Science)

Due to limited energy resources, it is important to minimize wasted heat energy from automotive and industrial sources. Since thermoelectrics can directly convert a thermal gradient into electricity, they are a useful way to reclaim otherwise lost heat energy. Mechanical vibration and rapid heating and cooling can generate stresses within thermoelectric materials that can cause them to fail. Thus, characterizing mechanical properties such as hardness and fracture toughness of thermoelectrics is important. In this study, Barium filled Skudderudite was reprocessed by vibratory milling in order to attain a smaller grain size. The mechanical properties were examined and compared to specimens with larger grain sizes. In

addition, sub-critical crack growth was examined under different environmental conditions at the time of indention to represent manufacturing conditions.

EXFOLIATED GRAPHENE NANO-PLATELETS (GNP)-HIGH DENSITY POLYETHYLENE (HDPE) NANOCOMPOSITES
Reema Al Dhaneem
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 162
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Per Askeland (Composite Materials & Structures Center), Carl Boehlert (Chemical Engineering and Materials Science), Frederic Vautard (Composite Materials and Structures Center)

This research addresses the effects of adding exfoliated Graphene nano-Platelets (GnP) to High Density PolyEthylene (HDPE), which is a commonly used plastic (thermoplastic). The addition of the nanoparticles in the HDPE matrix influences its mechanical properties (tensile, compressive, impact resistance, etc.). The resulting mechanical properties, added to the enhanced electrical and thermal conductivities of the composite, are attractive to many potential industries. An interesting change in the properties is the lower impact resistance the HDPE experiences with the addition of Graphene nano-Platelets (lower energy absorption). One way to investigate the reasons of this change is by looking at the fracture surfaces that the impact resistance test (IZOD Test) produces. This poster will compare the fracture surfaces of the HDPE and its composite, via images acquired using Scanning Electron Microscopy (SEM). Those images provide useful information in order to explain the differences in the mechanical properties of the two materials.

RACQUET STRING ANALYSIS
Cade VanRooyen
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 163
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

In all racquet sports the point of contact of the ball with the racquet is the strings. Whether the sport is badminton, racquetball or tennis the strings may differ as a result of the ball that it makes contact with. The purpose of this research project is to analyze string differences and fracture surfaces between the different racquet sports. Strings may break differently depending on their specific composition. This project will take a magnified look into the individual strings by way of a scanning electron microscope (SEM) to unveil properties of strings normally undetectable to the human eye.

LOW VISCOSITY OF THERMOSETTING OLIGOIMIDES
Jake Finkbiner
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 164
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Andre Lee (Chemical Engineering and Material Science)

This study examines the effect isomer ratio on the viscosity of thermosetting oilgoimides based on Double-Decker Silsesquioxane (DDSQ) structure. It was anticipated that inducing different compositions of the six isomers mixture of the DDSQ oligoimide could control the viscosity. Steady-state viscosities at different temperature were measured using parallel-plate geometry at a fixed shear rate. The control system contains about 12.5wt% of DDSQ-[trans(meta-imides)], 12.5wt% of DDSQ-[cis(meta-imides)], 12.5wt% of DDSQ-[trans(para-imides)], 12.5wt% of DDSQ-[cis(meta-imides)] 25wt% of DDSQ-[trans(meta/para-imides)] and 25wt% of DDSQ-[cis(meta/para-imides)]. To alter this ratio, additional DDSQ-[trans(para-imides)] and/or DDSQ-[cis(para-imides)] was incorporated to the control. It was found the addition of DDSQ-[trans(para-imides)] had a larger effect on viscosity than DDSQ-[cis(para-imides)]. It is hypothesized that this is due to the increase of the secondary bonding between oligomers with trans orientation.

DEVELOPING RAPID METHOD FOR QUANTIFICATION AND VISUALIZATION OF CROSS-CONTAMINATION OF SALMONELLA ON ALMONDS
Joanna Carroll
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 165
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Sanghyup Jeong (Biosystems and Agricultural Engineering), Bradley Marks (Biosystems and Agricultural Engineering)

Pathogenic bacteria poses as a major health risk in food processing industrial settings. Large scale bacterial cross-contamination can be computationally modeled using discrete element method. However, validation of a model using pathogens takes time and is incapable of visualization for qualitative assessment, which necessitate the need of effective surrogates for rapid quantification and visualization of cross-contamination. To qualitatively and quantitatively represent dry

bacterial cross-contamination GloGerm™ (5-μm, 100% synthetic organic colorant) powder, which becomes fluorescent under blacklight, was used as a surrogate for Salmonella. In this research, quantitative relationship between Salmonella and GloGerm concentration on almonds was determined. Using a spectrophotometer (400 nm) the light absorbance of serial dilutions (20%) of GloGerm was measured, which showed a linear relationship (GloGerm Concentration [g/mL] = Absorbance/2911.2; R2 = 0.9999). For the scale factor, uncontaminated almonds (1kg) were exposed to ten almonds coated with GloGerm within a rotating bench-top drum for 30,150, 750, and 1950 s and sampled to determine GloGerm concentration on almonds, which were compared with a previous experiment using Salmonella. The transfer rates of Salmonella and GloGerm during the first 30 seconds were the highest and then gradually increased. The linear and logarithmic scale factors between Salmonella and GloGerm surrogate were 79354 and -0.933 with RMSE of 0.54 and 0.45, respectively. Therefore, the GloGerm is considered as a rapid and effective surrogate for actual pathogenic dry cross-contamination test.

ELECTROCHEMICAL CHARACTERIZATION OF INFγ AND IP-10 BY CYCLIC VOLTAMMETRY
Shaurya Srivastava
Category: Engineering, Computer Science, and Mathematics, Section 1
Poster: 166
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

IFNγ and IP-10 are protein biomarkers of disease progression. As a result, it is necessary that methods used to detect IFNγ and IP-10 be rapid and cost effective. Current methods used to detect these proteins are costly and time consuming. Interferon gamma release assay tests require whole blood preparation that can last for 16 hours. ELISA tests that detect IP-10 require the purchase of costly kits and the results of these tests are color changes in liquid which are temporal. As a result, developing a faster, more efficient, and cost-effective procedure for the detection of these proteins is essential. In the Nano-Biosensors Lab, we are developing rapid electrochemical methods to detect these proteins. One of these electrochemical approaches is the use of cyclic voltammetry (CV). It is fast, simple, and cost effective. This particular research is a proof-of-concept study using CV to characterize various concentrations of IFNγ and IP-10. Preliminary results indicate that both IFNγ and IP-10 have similar CV profiles. The height of the voltammogram is concentration dependent showing the potential for using CV as a simple tool for quantifying IFNγ and IP-10. Our long-term goal is to develop simple electrochemical techniques to measure IFNγ and IP-10 in clinical samples and use it to monitor disease progression in patients. In conclusion, CV is showing to be a promising technique for a cost effective alternative to IFNγ and IP-10 detection.

POSTER PRESENTATIONS, SECTION 2

FILTRATION AND DETECTION OF LOW-CONCENTRATION E. COLI IN WATER
Matthew Vasher
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 168
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering)

The contamination of water by Escherichia coli can pose serious health risks to those who drink and use it. The purpose of this study is to devise an extraction method that will enable us to detect one E. coli cell per 100 mL of water in a filtration and detection system. An experiment was performed to detect E. coli at low concentrations. A diluted sample of E. coli O157:H7 was prepared and a micron cellulose filter was used to capture the bacteria. After performing an immunomagnetic separation, cadmium was attached to the cells to function as a signaling particle. The E. coli was then detected by performing stripping voltammetry on the sample incorporating a bismuth-deposited electrode. The long-term contribution of this research is the development of a simple device that could lead to safer drinking water and decrease the occurrence of illness from E. coli contaminated water.

RELATIVE ROTATIONS OF PELVIS AND RIB CAGE IN SEATED AND STANDING POSTURES
Jessica Buschman
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 169
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Tamara Reid Bush (Mechanical Engineering)

Digital human modeling is known for its ability to help improve the speed, value, and efficiency of creating products that involve human interaction. They are used in many sectors of industry, but developing accurate human models is challenging. These challenges arise from the large variations in anatomy and movement (Chaffin, 2001). For seating in particular, understanding how spinal articulation is achieved in the seated posture as compared to the standing posture is not well understood. The purpose of this research was to determine the relative influence of the rib cage and pelvis on spinal

curvature in both seated and standing postures. A total of 19 subjects were tested in this study; motion capture data was gathered based on four postures (arch, erect, comfort, and slouched) for both the seated and standing positions. Previous data cited that the pelvis and rib cage moved equally when rotating between the arched and slouched positions; the Biomechanical Design Research Laboratory found there is actually a relative influence of 27% pelvis, 73% rib cage on the overall spinal curvature. In other words, the rib cage rotates approximately 2.7 times more than the pelvis when a person moves from an arched to a slouched position. This was found in both standing and seated postures, regardless of gender. This much needed spinal articulation data are a necessity for improving human models and creating designs that support and move with humans.

NOVEL NEAR-INFRARED ABSORBING ELECTRON DONOR MATERIALS FOR TRANSPARENT PHOTOVOLTAICS
John Suddard-Bangsund
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 170
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Richard Lunt (Chemical Engineering and Materials Science)

In the midst of a global rise in both energy demand and environmental concern, organic photovoltaics (OPVs) present a potentially low-cost means of clean energy production. OPVs are formed from abundant materials, can be manufactured relatively easily and at low temperatures, and can be incorporated into flexible substrates due to their thin film properties. However, OPVs are currently limited, in part, by poor spectral overlap with the sun. The best cells to date absorb light only in the range of 300 – 800 nm, leaving about half of the incident solar power unused. In an effort to expand this range, this study explores several new solution-processable near-infrared (NIR) absorbing electron donor materials. Materials were measured for solubility in various solvents, spin-casted into uniform thin films, and characterized using UV-VIS spectroscopy. Photovoltaic performance of the materials was assessed by fabricating devices with planar and bulk heterojuntion structures and characterizing their current-voltage (J-V) and external quantum efficiency (EQE). After optimization of the device architecture and processing methods, photocurrent generation was demonstrated past 1000 nm. With further processing improvement, these promising organic candidates could be used in transparent energy-scavenging applications, or could be incorporated into efficient panchromatic tandem cells. In my presentation, I will discuss how electron donor layers can be optimized for further improvements and what achievements need to be made for OPVs to become commercially viable.

MODELING FORCES APPLIED BY THE INDEX FINGER OVER NORMAL AND REDUCED RANGES OF MOTION
Joshua Drost
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 171
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Tamara Reid Bush (Mechanical Engineering)

The current methods of diagnosing hand function in people with arthritis are subjective to the doctor and task-based. Recent research has modeled the motion of the hand in order to measure hand function; however, such models focus primarily on the kinematics of the hand and few pair that modeling with the forces that can be applied. This study sought to measure and model the maximum forces that the index finger can apply over the range of motion. Sixteen subjects without reduced hand function and sixteen subjects with reduced hand motion due to arthritis were tested. Six motions of the hand were collected using a motion capture system to determine the range of motion of the subject's hand. Following that, the subjects were asked to apply maximum force with the index finger on a six-axis load cell to determine both magnitudes and directions of forces in many positions. Simultaneously, a motion capture system measured the position of the index finger to determine its position within the range of motion. These forces and locations were fit to a model to determine the approximate maximum forces that could be applied over the entire range of motion. This research showed that adding forces to the kinematic model is possible and has the potential to enable diagnosing functional ability in patients with reduced hand function.

SYNTHESIS AND CHARACTERIZATION OF NON-PRECIOUS METAL CATALYSTS FOR OXYGEN REDUCTION IN FUEL CELLS
Nam Tran, Nathaniel Sunderlin
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 173
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Scott Barton (Chemical Engineering and Materials Science), Selvarani Ganesan (Chemical Engineering and Materials Science)

With their high efficiency, high power density, low/zero emissions and simple design, polymer electrolyte fuel cells (PEFCs) are considered as possible energy converting devices for many applications, mainly transportation and portable power generation. The increasing cost of precious metals has accelerated efforts to replace Pt metals with cost-effective non-precious metal catalysts for the oxygen reduction reaction (ORR). Among the non-precious metal catalysts, carbon based materials doped with nitrogen and transition metals have received considerable attention due to their superior ORR activity, stability, excellent electron conductivity and low cost. Among the transition metals used, Fe-based nitrogen carbon catalysts have attracted attention due to their reasonable activity and stability.

FRACTURE ANALYSIS OF COMPOSITE HOCKEY STICK (UGS200H)
Michael Zuker
Category: Engineering, Computer Science, and Mathematics, Section 2
Poster: 174
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

A fracture analysis of a broken graphite composite hockey stick shaft will be performed in order to discover the cause of failure. Analysis of material will be executed using knowledge of microstructure and how it affects mechanical properties of the material. A scanning electron microscope will be used to provide images of affected regions of the material in order to further analyze the sample on a microscopic scale. These SEM images will be incorporated into a poster along with other information to communicate to the audience and explain the possible cause of fracture.

POSTER PRESENTATIONS, SECTION 3

EVALUATION OF RESEARCHER-IN-THE-LOOP IMAGE ANALYSIS WORKFLOWS: MEASURING THE TIME SAVED BY PICKING ANCHOR POINTS WITH CHAMVIEW
Aaron Beckett
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 177
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Dirk Colbry (Institute for Cyber-Enabled Research)

The Chamview program demonstrates a new "researcher in the loop" approach to minimize the generation of new automated tools. Instead of focusing on algorithm accuracy, Chamview seeks to minimize a researcher's time spent annotating data by optimizing image analysis workflow. To this end, Chamview uses an approach that automatically searches a variety of anchor point (landmark) algorithms to find the best one that fits the current dataset. This approach can significantly reduce the amount of time it takes a researcher to identify and label anchor points (landmarks) in a dataset. This poster demonstrates that the workflow resulting from running both simple and complex point selection techniques in the background is no worse than annotating all of the points by hand in a variety of research domains. In the best case the software can save significant amounts of researcher time (33% in experimental settings) and effort and potentially assist in the creation of a fully automated tool.

ANALYSIS OF INSULATIVE AND TOUCHSCREEN GLOVES AND THEIR CAPACITATIVE CAPIBILITIES
Bashar Salah
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 178
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Per Askeland (Composite Materials & Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

A micro structure comparison between touch screen gloves (TG) and various regular winter gloves (RG) shall be studied and compared. The mechanism behind RG's inability and TG's ability to interact with capacitive touchscreens devices shall be explained and linked to microstructure and chemical composition. Micrographs shall be taken on a Zeiss EVO LS25 SEM under variable pressure conditions. The magnification on the SEM shall be altered and will range from approximately 50X to 5.0K X in variable pressure mode. N2 gas shall be pumped in to the SEM chamber to neutralize any charge accumulating on the surface of the gloves. Each glove's interior and outer surface shall be examined and these results will be analyzed. Performance of different TG brands shall then be tested with the capacitive screen of an Iphone 4s under different temperatures and moisture contents. Analysis of this data shall be made and reveal which brand of TG performs the best. In summary, micrographs shall be taken in variable pressure mode with N2 gas pumped into the chamber to neutralize any charge. Magnification of the inner and outer surfaces of the TGs and RGs shall be compared. Different brands of TG's shall then be tested on the capacitive screen of an Iphone 4 and compared to one another.

WATERPROOF MICROSTRUCTURES
Afton DeWyse
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 179
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Material Science)

Mammals, birds and amphibians that spend time in and around water have developed ways to repel the water from their fur, feathers or outer skin. Using the scanning electron microscope I will analyze what about their outer layer helps them to thrive in an aquatic environment. By looking at the micro structures of their water proofing techniques we can compare the

purposes and effectiveness of their protective outer layers. The similarities and differences found can lead to conclusions about their origin, evolution by natural selection and show evidence of convergence. Studying these kinds of structures can help us apply these configurations to everyday commodities. This is called biomimicry, using nature to create better products. This is useful because elements in nature have had many years to evolve its components to be efficient and effective.

VISION WATER
Wyatt Roehler
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 180
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Daniel Morris (Electrical and Computer Engineering)

The Vision Water Project aims to create code that can synthesize a three dimensional surface plot from a two dimensional image. Specifically we aim to use this code on the surface of water to synthesize three dimensional wave surface images from pictures of water surfaces. The code is a form of shape from shading written in Python where the program looks at the pixel gradient relative to the neighboring pixels and assigns a corresponding depth value. The output of the Python code can then be read in and recreated into a surface plot using Matlab code. Our research is important because the code that we are generating could be used to improve computer vision capabilities as a whole for everyone looking to interpret two dimensional images from cameras as three dimensional spaces. My poster presentation will consist of sample images and the corresponding output plots from them as well as an explanation of how the code works.

PLASMA TREATMENTS OF CARBON FIBER EPOXY COMPOSITES
Ana Veskovic
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 181
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Lawrence Drzal (Chemical Engineering and Materials Science)

Carbon fiber epoxy composites are surface treated with oxygen plasma as a sample preparation technique for scanning electron microscopy (SEM). The treatment etches away exposed epoxy, which causes the fibers to protrude from the composite surface and be more easily detected by the SEM. The effects of the plasma treatment vary with the power, gas pressure, and duration of the treatment, as well as with the gas used to create the plasma. Three common carbon fiber epoxy composites: AS4 fibers in SC-15 epoxy, IM7 fibers in SC-15 epoxy, and AU4 fibers in EPON 828 epoxy, were oxygen plasma treated, varying the four conditions, to determine how each variable affects the plasma treatment of the composites. The depth of the etching of the composites was measured using SEM, and changes in surface chemistry as a result of treatment were analyzed using x-ray photoelectron spectroscopy. The depth of epoxy etching was greater at longer treatment times and higher power levels. Oxygen plasma treatment resulted in deeper etching than did argon plasma treatment. The depth of etching also depended on the type of composite treated. The IM7/SC-15 composite proved to be more resistant to etching than did the AS4/SC-15 composite.

FUNGAL LIPID FERMENTATION ON COMBINED ACID- AND ALKALI-PRETREATED CORN STOVER HYDROLYSATE FOR BIODIESEL PRODUCTION
Christine Isaguirre
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 182
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Wei Liao (Biosystems & Agricultrual Engineering)

Lignocellulosic biomass is one of the most abundant and renewable sources in nature. Many studies have explored the possibility of using it as a feedstock for advanced biofuels, particularly bio-ethanol production. However, investigations of utilizing lignocellulose for microbial lipid production are limited. The ability to convert fermentable sugars from lignocellulosic material to lipid in a cost-effective manner is essential for commercial production of the process. Three major steps in the production of microbial oil from lignocellulosic biomass include: hydrolyzing the lignocellulose into fermentable sugars; metabolizing those sugars by oleaginous microorganisms into microbial lipids; and generating biodiesel from the microbial lipids. Fermentation of lignocellulosic hydrolysate is often preceded by washing and detoxification steps which require a large amount of water and chemicals. In order to develop an economically feasible process for lignocellulosic biofuel production, feedstock pretreatment and enzymatic hydrolysis must be optimized according to physiological characteristics of the target microorganism. In this study, a combined hydrolysis process, which first mixed dilute acid- and alkali-pretreated corn stover at an optimal ratio, directly followed by enzymatic saccharification, has been developed to remove the steps of neutralization and washing during lignocellulosic biofuel production. The oleaginous fungus M. isabellina was selected and applied on the combined hydrolysate to accumulate fungal lipid. Fungal cultivation on combined hydrolysate exhibited

comparable lipid yields with those from synthetic medium, indicating that the integration of combined hydrolysis with fungal lipid fermentation has great potential to improve performance of advanced lignocellulosic biofuel production.

SLOW CRACK GROWTH BEHAVIOR IN TETRAHEDRITE
Andreia Ditzel Facci
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 183
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Eldon Case (Chemical Engineering and Materials Science)

Thermoelectric materials can convert waste heat directly into electricity. Thus, the use of thermoelectrics in power plants or automobiles has the potential to be an important part of a strategy to carefully utilize our available energy resources. However, most thermoelectric materials are brittle and thus degradation due to cracking and fracture is a concern. Slow crack growth (also called environmentally-assisted crack growth) can occur when cracks induced by cutting or grinding thermoelectric materials extend when exposed to water vapor in the air. This study examines slow crack growth in the thermoelectric material tetrahedrite, which is being developed at Michigan State University. In addition to the natural mineral tetrahedrite and synthetic tetrahedrite, composites including small volume fractions of SiC nanoparticle will also be studied.

DESIGN OF FUNCTIONALLY ASYMMETRIC SIRNAS
Rebecca Carlson, Sarah Thorwall
Category: Engineering, Computer Science, and Mathematics, Section 3
Poster: 184
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): S. Patrick Walton (Chemical Engineering and Materials Science)

RNA interference (RNAi) is a native eukaryotic pathway through which small RNA molecules can induce gene silencing by degradation of complimentary 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. Functionally, siRNAs enter the RNAi pathway as a double-stranded structure, one strand is then 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 fluorescent reporter system in cultured cells, while the other directly measures the amount of each siRNA strand incorporated into RISC. 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 will 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.

POSTER PRESENTATIONS, SECTION 4

MASCARA PRODUCT COMPARISON
Angela Ferrara
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 186
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Carl Boehlert (Chemical Engineering and Materials Science)

Throughout this research process, a Scanning Electron Microscope (SEM) will be used to photograph samples of eyelashes with mascara on them. The mascara coating on the eyelashes will be researched in order to conduct a product comparison. This research will be used in order to compare the quality of different mascaras and their prices. This is interesting because there are so many different brands of mascaras and each brand focuses on a different quality, such as being long lasting, lash lengthening or being waterproof. Several of these qualities will be compared across different a variety of brands to see if there is a correlation between price and quality.

THERMOELECTRIC MODULE MEASUREMENT SYSTEM
Nathan Blanke
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 187
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Timothy Hogan (Electrical and Computer Engineering)

As energy has become a growing concern in modern society, the ability to utilize the full potential of energy sources become

a great area of interest. Even the power plants that are now used to generate the majority of usable energy for consumers are only about 30-40% efficient, with most of the wasted energy being released in the form of heat. Thermoelectric generators (TEGs) are solid-state devices that use nothing but a temperature gradient (waste heat given off) to generate electrical energy that can be recycled back into a system to increase efficiency. Although not extremely efficient themselves currently, thermoelectric devices are a growing field as various different materials are being tested to see how well they would perform as a TEG in industrial applications such as on cars or other high temperature systems. There are many aspects that affect efficiency of a TEG, but the system that I have developed is used to specifically measure the heat flow properties through sample materials (thermoelectric modules) to better characterize how well they would work by this one criterion.

PREPARATION AND CHARACTERIZATION OF HYDROPHILIC POLYSILOXANES
Caleb Andrews
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 188
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Sudhanwa Dewasthale (Chemical Engineering and Materials Science), Dan Graiver (Chemical Engineering and Materials Science), Shawn Shi (Chemical Engineering and Materials Science)

Organosilicons have a wide use in industry ranging from contact lenses to commercial antifoam. However, all polysiloxanes are hydrophobic and are immiscible in water. Furthermore, although some silanes are soluble in water at low concentration, their solubility depends on the pH. We have successfully prepared a new series of hydrophilic silanes and polysiloxane that are hydrophilic and water soluble. It is expected that these new materials will be useful in personal care products. Our current research is focused on the preparation process, reaction kinetics and characterization of these monomers and polymers.

IN-SITU MECHANICAL ANNEALING OF COLLOIDAL LITHOGRAPHY
Jared Gaumer, Jongwon Kim
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 189
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Junghoon Yeom (Mechanical Engineering)

Colloidal particles that assemble into ordered, close-packed two-dimensional (2D) monolayers have attracted tremendous attention due to many potential applications including surface enhanced Raman spectroscopy, nanosphere lithography, and photonic bandgap. Well-ordered, 2D colloidal crystal can be formed by spin-coating, convective assembly, or simply drying over the flat surface with controlled evaporation. However, during self-assembly, these close packed colloidal monolayers are subject to a high degree of crystal defects forming grain boundaries. It is our interest to create a uniform colloidal film of large size without defects. Here we are investigating the use of a shear force from mechanical vibration to increase the coherence of the assembly process. A simple deposition chamber has been built to assist the self-assembly of the polystyrene colloidal particles (microspheres or nanospheres). Colloidal particles suspended in a solution are deposited onto a silicon or coverglass substrate (~ 1 cm in diameter). The solution is then allowed to evaporate under controlled conditions while being subjected to acoustical vibration. The vibration is applied using a piezeoelectric material, which oscillates in a controllable fashion when subjected to an AC current. The control parameters include the amplitude A and frequency ω of the vibration. We investigate how A and ω can be used to minimize the crystal defects inherent in the assembly of these colloidal particles. This will allow for a more predictable outcome which can be used to create materials with predictable properties for industrial applications.

MODIFIED NANO-FILTRATION OF PERCHLORATE IONS
Anna Sommerfeld
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 190
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Ilsoon Lee (Chemical Engineering and Material Science)

Perchlorate ions resemble iodide ions in size, causing interference with the thyroid glands' uptake of iodine. Consequently, the thyroid is incapable of secreting essential hormones. Owing to its harmful effects the removal of this ion constitutes an important research area. Membrane filtration is the proposed method of extraction for this water contaminant. There are two standard pressure-driven, ion rejecting membranes: nano-filtration and reverse osmosis. NF membranes have high permeability, low rejection and low cost. The RO membranes have low permeability, high rejection and high cost. The goal of this project is to modify an NF membrane to have comparable rejection capabilities as an RO membrane while maintaining a higher permeability. The process used for modification of the NF membrane is called layer by layer. The procedure involves the deposition of alternately charged polymers (polyelectrolytes) on the base membrane to form multilayers. The final layer added is always negatively charged in order to repel the perchlorate ion which has a negative charge as well. A cross flow system tests the membranes performance at varying process conditions. The filtered water is then analyzed for perchlorate ions using liquid chromatography-mass spectrometry (LC-MS/MS). It is apparent that the type of

polyelectrolytes, the number of layers used and the deposition conditions like pH significantly affect the performance of the membrane. These factors are optimized to obtain the ideal rejection and permeability.

PAPER PRODUCTS: THE DIFFERENCES BETWEEN TOILET AND FACIAL TISSUES
Elizabeth Foss
Category: Engineering, Computer Science, and Mathematics, Section 4
Poster: 191
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Materials Science)

In the age of technology, many human resources have been severely altered since their original designs to fit modern day society, but some necessities have stayed relatively unchanged for many years. Toilet tissue and facial tissue have been produced for centuries—the first toilet paper products were used in the late fourteenth century. Only small improvements upon these two products have been made such as the addition of two-ply tissues and medicated tissues. This project focuses on the similarities and differences between these two tissue products. Using microscopy of various modern day tissue products, this research will show how their micro-level structures compare and how these structures aid their individual product functions. Within the results, this project will tell if these two products differ immensely or if they are similar microscopically and can be used interchangeably.

ENVIRONMENTAL SCIENCE & NATURAL RESOURCES

ORAL PRESENTATIONS, SECTION 1

WATER QUALITY OF THE RED CEDAR RIVER AND ITS RELATION TO THE BIODIVERSITY OF MACROINVERTEBRATE INHABITANTS
Daniel Aaron
Category: Environmental Science and Natural Resources, Section 1
Location: Lake Michigan Room, 9:00 AM-9:15 AM
Mentor(s): Matt Rowe (Zoology)

The effect infrastructure has on natural ecosystems is great. This is true of the Red Cedar River in East Lansing, Michigan, as it has development on both of its banks and flows through Michigan State University's campus. We predicted that the water quality would be lowest in the center of campus while water quality would be the higher in the areas east and west of campus. To accomplish this, kick nets were used to sample the benthic region of the river for macroinvetebrates which were then identified. Also taken were various abiotic measurements of the river. The Shannon Diversity Index for the sites were 0.970951 for east campus, 1.572624 for center campus, and 1.368124 for west campus. We calculated, the diversity of central campus and west campus are not significantly different from each other but east campus is significantly different from both of the other locations. We found that the campus has an effect on the river and diversity increases as the river passes through campus. This is the opposite of our prediction. These observations could be used in the future to help determine methods for lessening the impact of people and their pollution on river water quality.

REGIONAL ANALYSIS OF THE SPATIAL AND TEMPORAL PATTERNS OF ENVIRONMENTAL HG LOADINGS IN THE GREAT LAKES
Sydney Ruhala
Category: Environmental Science and Natural Resources, Section 1
Location: Lake Michigan Room, 9:15 AM-9:30 AM
Mentor(s): David Long (Geological Sciences)

Predicting future concerns about exposure to Hg relies on understanding the relative importance of local versus regional sources. It is hypothesized that the dominant environmental Hg loadings are primarily derived from a mix of regional sources, as atmospheric transport is considered the main pathway. If true, Hg loadings should be similar across a region or possibly show a regional gradient related to sources or population. Sediment cores were taken from 47 inland Michigan lakes (a large region within the Great Lakes basin) to examine spatial and temporal Hg loading patterns. Sedimentation rates were determined via Pb-210 dating to 1) construct chemical sediment chronologies and 2) calculate sediment focusing-factors to adjust calculated anthropogenic inventories. Lakes were grouped into sub regions, Upper Peninsula, and northern and southern Lower Peninsula (the Michigan ecotone was used to divide the Lower Peninsula into two sub regions). Anthropogenic inventories did not exhibit a gradient across the region, but rather showed similar Hg loadings amongst lakes (including the Great Lakes) with the exception of 4 lakes (Cass, Crystal (Montclam), Houghton, Charlevoix). Chemical sediment chronologies also supported the hypothesis, while highlighting the additional influence of local scale sources. Based on the sediment chronologies it is apparent that Hg loadings in several lakes are still increasing despite the recently implemented environmental regulations meant to decrease Hg emissions. Cause for this accumulation is unclear; the excess

Hg could be from a local scale source or the result of a decrease within lake productivity, which would lessen the effects of dilution.

A COMPARATIVE LOOK AT WASTE MANAGEMENT SYSTEMS IN THE U.S. AND CUBA
Renee O'Connell
Category: Environmental Science and Natural Resources, Section 1
Location: Lake Michigan Room, 9:30 AM-9:45 AM
Mentor(s): James Lucas (Undergraduate Education)

Waste and pollution affect everyone on Earth. This study compares the waste management systems in Cuba and the U.S. as means of answering the question: "With limited resources, would Cubans tend to be more conscientious about how much waste they generate and how they dispose of their waste when compared to Americans?" As Cuba has drastically different government and economic systems from that of the United States' systems, comparing the two systems and looking at the pros and cons of each can help society understand and consider alternative and perhaps better methods to solving waste problems. Due to the embargo between Cuba and the United States, a limited amount of research has been done inside Cuba, and this study opens a door that has been closed to many for several years. The study uses a combination of first- and second-hand accounts. During my trip, I took pictures, interviewed locals as well as recorded my observations in a journal. In the United States, more of the focus is on recycling, whereas in Cuba people instead reduce their overall consumption or reuse materials to the best of their ability. After visiting Havana and a few other places inside the country, I concluded that Cubans are not as environmentally conscious as I originally expected. In this presentation, I will go into more detail about why this is the case, compare and contrast the U.S. and Cuba, as well as propose solutions for both nations.

A PRELIMINARY STUDY OF EARLY DIAGENETIC PATTERNS OF METALS IN LAKES
Kelsey Prochazka, Sydney Ruhala
Category: Environmental Science and Natural Resources, Section 1
Location: Lake Michigan Room, 9:45 AM-10:00 AM
Mentor(s): David Long (Geological Sciences)

Metals move through the environment sorbed to particles and are transported to low energy zones such as lakes where they are buried. Sequestration in sediments can be influenced by early diagenesis, which is driven by terminal electron-accepting processes that change reduction and oxidation (redox) conditions within near surface sediments. These changes may release metals from sediments to overlying lake water with possible impacts on lake ecosystems. Vertical porewater profiles were determined for chemicals in two inland Michigan lakes, Thompson and Gull. The hypothesis is that concentrations in porewater are in steady state balance with early diagenetic processes. Expected changes include redox elements being reduced with depth in the order, Mn, Fe, As, and U, and mobility of non-redox sensitive elements (Cu, Pb, P) is influenced by sorption reactions with Mn/Fe oxides. Results show this pattern is observed for Mn, Fe, and U in both lakes, while arsenic shows expected patterns in Thompson, but not in Gull where there is evidence of release in upper sediments. There is also evidence of U sequestration in upper sediments of both lakes. Cu does not exhibit a trend in Gull, but Thompson shows evidence of influence by sorption with Mn/Fe oxides. Pb and P show release in both Gull and Thompson, possibly a result of Fe oxide dissolution. The results generally support the hypothesis; however additional processes (not mentioned in hypothesis) influence the mobility of metals and the potential for release to overlying lake water.

ENVIRONMENTAL ATTITUDES AND PRACTICES: WHAT THE UNITED STATES CAN LEARN FROM CUBA
Miya DeVoogd
Category: Environmental Science and Natural Resources, Section 1
Location: Lake Michigan Room, 10:00 AM-10:15 AM
Mentor(s): James Lucas (Undergraduate Education)

Cuba is an increasingly developing country, but is not considered as developed or advanced as the United States. If America is so advanced, why is it that Cuba seems to have much more sustainable environmental practices and approaches than America does? After travelling to Cuba through MSU's Study Abroad program and conducting research verbally, by observation, and by surveys, I will be comparing the results regarding Cuban citizen's environmental attitudes to similar research I've conducted in Lansing, Michigan. My presentation will highlight the main distinctions between American and Cuban environmental attitudes and why they differ. The results will yield a response as to why and how the United States can take example from the Cuban's sustainable attitudes. These results could prove important in learning how to painlessly influence Americans citizens (and even citizens from countries around the world) to lead more sustainable lives.

PHENOTYPIC AND GENOTYPIC DIVERSITY OF PSEUDOMONAS AND AEROMONAS OF THE RED CEDAR RIVER
Allison Chan, Karen Davidge, Abigail Tomlinson
Category: Environmental Science and Natural Resources, Section 1
Location: Lake Michigan Room, 10:15 AM-10:30 AM
Mentor(s): Terence Marsh (Microbiology)

The natural microbial populations of freshwater systems are diverse, seasonally dynamic and critical for the functioning of this essential ecosystem. The purpose of this study was to analyze phenotypic and genotypic attributes of Pseudomonas and Aeromonas populations in the Red Cedar River over a span of seven weeks. Infections with Aeromonas are an emerging problem and multiple antibiotic resistance strains of Pseudomonas and Aeromonas are being seen increasingly in the clinic. Our analysis was designed to investigate the phylogenic diversity and phenotypic attributes related to pathogenicity of Pseudomonas and Aeromonas populations isolated from the Red Cedar. We hypothesized that these populations would vary over time, correlating with rain events or temperature. At each sampling, we isolated 96 strains and characterized each strain for antibiotic resistances, ability to form biofilms, carriage of virulence genes and type III secretion system, and phylogeny. Consistent with previous reports, we found that bacterial counts increased after rain events. Pseudomonas spp. were numerically dominant during and shortly after rain while Aeromonas spp. dominated during dry spells. Antibiotic resistance patterns were different from those of clinical strains. We posit that these differences are due to different selective pressures on clinical and river populations and suggest that Red Cedar populations of Pseudomonas are now a reservoir for clindamycin and erythromycin resistance. 386 isolates have been analyzed for biofilm formation and 188 isolates have undergone PCR for detection of virulence factors. Next generation sequencing suggests that Pseudomonas and Aeromonas strains are minor populations of the Red Cedar River.

ORAL PRESENTATIONS, SECTION 2

BIODIVERSITY OF BIRDS: SOUND RECORDINGS IN COSTA RICA
Kayla Felger
Category: Environmental Science and Natural Resources, Section 2
Location: Lake Superior Room, 1:30 PM-1:45 PM
Mentor(s): Pamela Rasmussen (Zoology)

Conservation of biodiversity is essential to sustainability of the environment, to the preservation of resources necessary for life, and to scientific advancement through the research of natural systems. Bird diversity, specifically, plays an important role in ecology in that birds act as seed dispersers and pollinators, help to control rodent and insect populations, and serve as a food source for many predators. One way of contributing to avian biodiversity research and conservation is through the documentation of bird sounds and conversion to sonograms. Sonograms can be used for species identification and elucidation of behavioral information. When sonograms are combined with data such as field notes, climatic trends, and location, sound recordings can be a powerful tool for investigating avian biodiversity, and can even be instrumental in the discovery of new species. Sound recordings and related data can be uploaded to carefully-regulated online databases for public access and research use. For a field project in Costa Rica, I made sound recordings of over five bird species and documented them with field data at the La Selva Biological Station. Using RavenLite I made, analyzed, and verified identifications of sonagrams and media files that I then uploaded to Project AVoCet (avocet.zoology.msu.edu). AVoCet is an online database containing over 16,000 recordings of over 4,500 bird species. Many of these recordings now freely available over the internet were made by MSU students in several different countries and continents. Through this MSU-based project, research and conservation of avian biodiversity are promoted.

GENETIC ASSESSMENT OF MIGRATORY BEHAVIOR AND MORPHOLOGY AS MEANS OF SYSTEMATIC CLASSIFICATION OF CANADA AND CACKLING GEESE (BRANTA CANADENSIS/HUTCHINSII)
Emily Cannell
Category: Environmental Science and Natural Resources, Section 2
Location: Lake Superior Room, 1:45 PM-2:00 PM
Mentor(s): Kim Scribner (Fisheries and Wildlife)

Historically, North American populations of Canada geese (Branta canadensis) and Cackling geese (Branta hutchinsii) have been classified as species comprised of multiple subspecies that have been recognized based on morphology, degree of geographic isolation, and migratory routes. There are currently 11 recognized subspecies in North America based on body size and plumage, which use one of four migratory flyways. These species show long-term family associations and strong breeding site fidelity, but shared migratory routes and wintering areas can allow gene flow between populations. In this study, we examined whether common migratory routes and wintering areas affect the genetic variation among populations and within and among subspecies. We used a 143 nucleotide segment of the D-loop sequence, a highly variable region of the mitochondrial DNA genome, to examine phylogeographic relationships among geese sampled throughout North America in order to determine the accuracy of subspecies assignments based on morphology. We show that genetic data support recently proposed changes in species classification. Current divergence was estimated to be ~14% between proposed species and averaged ~2% among samples collected from different established subspecies and flyways. Data can be used to manage arctic and subarctic breeding birds that are increasingly impacted by human activities.

NANOPARTICLE ENHANCED MEDIA FOR THE RECOVERY OF PHOSPHORUS FROM WASTEWATER
Bethany Swanberg
Category: Environmental Science and Natural Resources, Section 2
Location: Lake Superior Room, 2:00 PM-2:15 PM

Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)

High levels of phosphorus in wastewater discharge causes harm to aquatic environments. Phosphorus is also a valuable resource and traditional sources of phosphate are becoming increasingly scarce. This study is an evaluation of a porous, ceramic, nano-enhanced iron-based media which sorbs phosphorus from wastewater and allows for the recovery of that phosphorus as well as reuse of the media. Several columns filled with varying volumes and types of media have been continuously supplied with fresh domestic wastewater. The column influent and effluents are tested weekly to determine the total sorption of phosphorus by the media. The media has shown considerable promise, and results are expected to show that it is a cost-effective way to remove and recover phosphorus from wastewater.

GENETIC ANALYSIS TO ESTIMATE TRENDS IN STRAIN-SPECIFIC RECRUITMENT OF EMERGING WILD LAKE TROUT (SALVELINUS NAMESCHUS) POPULATIONS IN LAKE HURON
Michael Hazelbaker
Category: Environmental Science and Natural Resources, Section 2
Location: Lake Superior Room, 2:15 PM-2:30 PM
Mentor(s): Jeannette Kanefsky (Fisheries and Wildlife), Kim Scribner (Fisheries and Wildlife)

After nearly three decades of stocking hatchery fish from multiple strains in Lake Huron, there has been a resurgence of natural lake trout (Salvelinus nameschus) populations. Because naturally produced lake trout are unmarked, their parentage, and thus hatchery strain of origin, cannot be readily distinguished. Our objective was to determine strain of origin using genetic analyses. Fin samples or scales were collected from unmarked lake trout in Lake Huron. Genotypes were determined using 15 polymorphic microsatellites. Using mixed stock analysis the genotypes of unmarked individuals were compared with the baseline data from the 13 contributing hatchery strains to estimate proportional contributions of each hatchery strain to the mixtures sampled. Samples from two time periods early and late (2002-2004; 2009-2012 respectively) during the period of resurgence in wild Lake Huron stocks were analyzed to determine the contribution of each hatchery strain and how the genetic composition of the population changed over time. The results will help managers to frame future restocking and restoration efforts in other Great Lakes where lake trout are not self-sustaining.

THE PREVALENCE OF HEARTWORM INFESTATION OF COYOTES (CANIS LATRANS) IN MICHIGAN
Bethany Myers
Category: Environmental Science and Natural Resources, Section 2
Location: Lake Superior Room, 2:30 PM-2:45 PM
Mentor(s): Matthew Zwiernik (Animal Science and Veterinary Medicine)

This study determines the prevalence of canine heartworm in Michigan's coyotes (Canis latrans) to elucidate the potential these animals are a reservoir for heartworm transmission to domestic dogs. Canine heartworm (Dirofilaria immitis) is a parasite that impacts canine health and costs American pet owners millions of dollars annually for prevention and treatment. Despite significant efforts the infection rate of Dirofilaria immitis in domestic dogs has increased. In cooperation with the Michigan Department of Natural Resources (MDNR), a coyote heartworm survey was initiated during the 2010-11 and 2011-12 Michigan coyote hunting/trapping season. The study was expanded during the 2013-14 season to include additional counties and additional health-related individual morphological measurements. Participating fur buyers were trained and supplied with standard operating procedures and equipment. Carcasses were labeled post pelage with a tag indicating sex and location of animal collection and transferred to the Michigan State University Wildlife Toxicology Laboratory for necropsy. Whole animal morphological measurements including length, weight, age and nutritional status, as well as heart specific measures of length, width, weight, presence of heartworm and extent of infection was quantified. The incidence of Dirofilaria immitis in coyotes was 44% and 38% for the 2010-11 and 2011-2012 trapping seasons, respectively. The 2013-2014 data including significant covariant interactions and overall conclusions will be presented. Quantifying heartworm infection in wild coyote populations may provide important information for improvements in conservation management methods as well as spotlight the importance of heartworm control for owners of domestic canines.

POSTER PRESENTATIONS, SECTION 1

CONTRIBUTION OF FISHING TRIP SPENDING TO MICHIGAN'S ECONOMY
Jonathon Siegle
Category: Environmental Science and Natural Resources, Section 1
Poster: 195
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Frank Lupi (Agricultural, Food and Resource Economics)

Although fishing trip-related expenditures in Michigan have been estimated to exceed $1 billion annually (NSFHWAR, 2011), relatively few details are known about this money flow. Managing fisheries requires knowledge not only of total expenditures, but also which economic sectors and regions are receiving these expenditures as well as the relative amounts of spending generated by different types of fishing. By providing a more comprehensive measure of the contributions of

anglers to local economies, our research will better inform fisheries management and regional economic planning. To collect data, a combined internet and mail survey was conducted with 4,099 randomly-selected licensed anglers in Michigan (response rate=44%). Anglers reported their number of fishing trips during the 2012-2013 season for five fishing categories based on modes and trip length, and anglers provided detailed expenditures for a selected trip. Analyses indicate fishing out of a boat on the Great Lakes had the highest total trip-related spending per person with a mean of approximately $4,400 per year, and fishing at an inland lake had significantly different total spending per person with a mean of approximately $1,000 per year (p=0.002). We also analyze differences in spending profiles among various modes of trout and salmon fishing, as well as between multiple day trips and single day trips. Community leaders and business owners can use this information to better understand the portion of business that can be traced back to Michigan anglers and the natural resource base of the local economy.

CALLING IN THE FACE OF DANGER: RISK-TAKING AND CONDITION IN THE GRAY TREE FROG (HYLA VERSICOLOR)
Levi Storks
Category: Environmental Science and Natural Resources, Section 1
Poster: 196
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Thomas Getty (Zoology), Michael Kuczynski (Zoology)

Evolution can give rise to amazing subtleties in animal behavior. One driver of this that has been studied in a range of species is the relationship between residual reproductive potential and sexual signaling. Specifically, we expect individuals in worse condition to take more risk in sexual signaling behaviors than those in better condition since these individuals have potentially fewer future reproductive opportunities. Individuals in worse condition take more risk in order to secure more reproductive opportunities in the short term since they have less future reproductive potential. I studied this in the gray tree frog (Hyla versicolor), a species of North American anuran that gathers in massive breeding choruses at woodland ponds through late spring and early summer. Intense calls produced by males in these choruses make them more conspicuous and increase their risk of predation. Calling thus presents a trade-off between risk of predation and breeding success. I measured the time it took for a male to resume calling after a simulated predator disturbance in these males as a proxy of risk. In my sample, males in lesser body condition had shorter calling latencies and thus took more risk than those in greater body condition, as predicted. Future work will expand on this phenomenon, quantifying the components of the call itself that affect male attractiveness and how these may change before and after a predator disturbance.

EXPLAINING THE VARIATION IN LARGEMOUTH BASS NESTING SUCCESS
Darrin McCullough
Category: Environmental Science and Natural Resources, Section 1
Poster: 198
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Mary Bremigan (Fisheries and Wildlife)

Black bass (Micropterus spp.), particularly largemouth (M. salmoides) and smallmouth (M. dolomieu) provide recreation to diverse anglers, generate revenue, and are keystone species in Michigan waterbodies. The continued success of these fisheries depends on successful reproduction of black bass populations. Fishing of nesting male bass, who guard eggs and young offspring at their nest sites in May and June, may result in failure of the nest to produce offspring, with uncertain implications at the population scale. Nest success rates (i.e., survival of offspring to the free-swimming 'upfry' stage) can be influenced by multiple natural and anthropogenic variables, including fishing. The effects of fishing during the nesting period are of particular relevance for management in Michigan, because black bass fishing regulations were recently modified to allow a catch and immediate release (CIR) season in May, prior to the traditional possession season, which opens during Memorial Day weekend. We are using data collected from three southern Michigan lakes during 2009-10 and nest survival models in Program MARK to quantify black bass nest success rates and determine the ability of several natural and anthropogenic variables to explain variation in nest success rates among and within lakes and seasons. Results to date indicate that nesting males were more likely to produce a successful nest during Michigan's CIR season than during the possession season. Also, the reduction in nest success rates between the CIR and possession seasons appeared to vary among lakes, with the largest reduction occurring in our lake with the highest fishing pressure.

TRASH, POLLUTION, AND THE RAINFOREST
Darvish Goode
Category: Environmental Science and Natural Resources, Section 1
Poster: 199
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Gabriel Ording (Entomology), Pamela Rasmussen (Zoology)

Untreated solid waste and excessive pollution negatively impact all of Earth's inhabitants; real life consequences include higher health care costs, diminished tourism revenue, and wildlife loss. Plus, nutrient runoff harms coral reefs, while sea turtles and seabirds are killed from ingesting plastic waste. Peninsular Malaysia and the States of Sabah and Sarawak, as well

as Brunei are exceptionally biodiverse in land and marine animals that are vulnerable to pollution from construction projects, trash, and incineration, which is also true of their unique geological characteristics. While I was in Malaysia and Brunei, besides interviewing locals, I observed poor waste management in their rainforests and waterways. I concluded that inadequate waste management established the need for increased efforts to reduce pollution, properly dispose of trash, recycle efficiently, and to research alternative methods to efficiently manage trash. The governments of Malaysia and Brunei as well as private waste management companies must better educate their people, regulate their waste management industries, and enforce their regulations to effectively deal with these problems.

EFFECTS OF A DAM ON ALGAL GROWTH IN A RIVERINE ECOSYSTEM IN CENTRAL MICHIGAN
Taylor Chambers
Category: Environmental Science and Natural Resources, Section 1
Poster: 200
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lisa Stelzner (Plant Biology)

Dams can have a major impact on organisms downriver due to the altered abiotic conditions they create. Our observational study examined the effect of dams on algal growth. We hypothesized that dams increase algae growth because dams expose rocks, and water flow over the rocks could increase dissolved oxygen (DO), a vital requirement for algae growth. We predicted that tiles placed downriver of the dam will show greater algae growth and higher DO than tiles upriver. We also predicted that at a shallower depth, there would be more algal growth due to increased sunlight We placed tiles in the Red Cedar River at Michigan State University in three locations relative to a dam (downriver shallow, upriver shallow and upriver deep). We measured percent cover of algae on each tile by overlaying transparent grid and counting the number of squares that had a significant amount of growth within them. We also measured DO content at each location using a dissolved oxygen probe. We found that algae growth was greater downriver of the dam ($p = 0.000346$), but it was not correlated with a significantly higher DO level ($p = 0.537$). Also, depth did not influence algal growth. We conclude that there was a higher algal growth downriver of the dam, but it was not due to changes in DO. Other studies regarding algal growth in response to a dam should look into other possible factors causing an increase in algal growth downriver.

REGENERATION OF NANO-COATED IRON OXIDE MEDIA FOR PHOSPHORUS RECOVERY
Lauren Costantini
Category: Environmental Science and Natural Resources, Section 1
Poster: 201
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)

Phosphorus is a limited resource that is vital to plant growth and the optimization of crop production. Although it is increasingly scarce, phosphorus-rich water often runoffs from crop land and wastewater, allowing valuable resources to be discharged into the environment where they could potentially cause an imbalance. High concentrations of phosphorous stimulate an overgrowth of algae, which can exhaust oxygen levels and decrease overall water quality. Adsorption is a method used to extract phosphorous from the water supply by latching the phosphorus onto the surface of a media and immobilizing it. MetaMateria Technologies (Columbus, OH) utilized this process to create a media of iron nano-crystals. As the iron and phosphorous continue to bond together, the capacity of the media to remove phosphorous decreases and the media must be regenerated. The media can then be reused and the phosphorus can be recycled. In this study, a sample of media that had been adsorbing phosphorus from wastewater for over two hundred days was regenerated and phosphorus recovery levels were compared. The regeneration process involved soaking the media in a solution with a basic pH level to release the phosphorous from its surface. Results from this ongoing research will be presented and interpreted in the context of the media use in a wastewater treatment system.

POSTER PRESENTATIONS, SECTION 2

NUTRIENT AND CONTAMINANT DETENTION TIME THROUGH A DAM: MODEL DEVELOPMENT
Haley Celovsky
Category: Environmental Science and Natural Resources, Section 2
Poster: 204
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Anthony Kendall (Geological Sciences)

The estimation of detention time for nutrient and contaminant transport through a dam is essential in understanding the downstream concentration of these parameters for purposes of water quality assessment. A modeling program, currently under development, will be able to predict the detention time of water across any dam in the state of Michigan, and all of the High Plains states. Research over the last year, funded by both NASA and NSF, has allowed for the collection and analysis of data provided through the US Geological Survey's National Hydrography Dataset (NHD) and the US Army Corps of Engineers (USACE). Such data is reflective of registered dams in the aforementioned states and includes criteria essential to the

estimation of a dam's detention time. Over the last year, research was conducted to create a model that estimates the storage capacity of a dam given its hydraulic height, one of the parameters provided by USACE. Initial research was funded by NASA and included model development, using ArcGIS and Excel, for the state of Michigan. After the model's success in estimating storage capacity for Michigan dams, the method was extrapolated to the High Plains states, and is currently funded through NSF. The storage capacity of any dam will allow for the development of a modeling program that predicts detention time through any dam, given a variation of independent and dependent parameters. All research is conducted through the Department of Geological Science at Michigan State University.

MICROBIAL NITROGEN FIXATION IN BIOFUEL CROP PLANTS
Phil Colgan
Category: Environmental Science and Natural Resources, Section 2
Poster: 205
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Aaron Garoutte (Microbiology and Molecular Genetics)

In order for renewable and environmentally sustainable biofuels to become a practical route towards relinquishing our dependence on fossil fuels, we must optimize the growth of an energy crop so that it requires as little external nutrient input as possible. One promising method of achieving this goal involves manipulation of symbiotic plant-microbe interactions localized in and on the plants root system. These microbes aid the plant by providing services such as the production and acquisition of limiting nutrients and plant growth factors. Microbial nitrogen fixation is among the most important services microbes can provide the plant. To identify important microbial players associated with biofuel crop plants, two hundred bacterial isolates were taken from the soil, roots, and leaves of switchgrass and miscanthus plants. The isolates were then tested for the presence of the nifH gene via PCR, which codes for a subunit of the nitrogenase enzyme which facilitates microbial nitrogen fixation. Of the two hundred isolates, four were found to harbor the ability to fix nitrogen.

IMMATURE STAGES OF DEVELOPMENT IN THE PARASITIC WASP, *TRISSOLCUS JAPONICUS* (HYMENOPTERA: SCELIONIDAE), ON ITS HOST, *HALYOMORPHA HALYS* (HEMIPTERA: PENTATOMIDAE)
Heather Leach
Category: Environmental Science and Natural Resources, Section 2
Poster: 206
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Ernest Delfosse (Entomology)

The morphological changes experienced during the immature stages of the solitary endoparasitic wasp, *Trissolcus japonicus* Ashmead (Hymenoptera: Platygastridae: Scelionidae), were studied. This wasp attacks eggs of the Brown Marmorated Stink Bug (BMSB), *Halyomorpha halys* (Stål) (Hemiptera: Pentatomidae), a generalist agricultural invasive pest in the U.S. Six phases of development were identified, along with several other distinctive characteristics of parasitism. Time to emergence and percent parasitism were also monitored. Males emerged on average 4 days faster than females at 20 °C, 60% RH, and 16:8 L:D (Day 20 vs. Day 24). Development rates between males and females did not differ until eye sclerotization began on Day 14. Percent parasitism in this study was 94%. In general, immature stages of endoparasitoids are poorly documented. This work contributes to a more thorough understanding of growth and maturation in this wasp. Knowing how to recognize the development phases of the wasp will enable us to evaluate the success of parasitism of BMSB in the field. This information will impact the implementation of *T. japonicus* as a classical biological control agent for the BMSB.

COMPARISON OF CORN AND SOYBEAN SOIL USING SEM IMAGING
Amy Murphy
Category: Environmental Science and Natural Resources, Section 2
Poster: 207
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Per Askeland (Composite Materials and Structures Center), Carl Boehlert (Chemical Engineering and Material Science)

This research study will focus on testing and comparing soil samples from a corn field, soybean field, and standard yard located in Central Illinois. Soil composition is an important factor affecting crop rotation, which is a common practice employed by farmers to reduce excess build up or depletion of necessary nutrients utilized by crops; crop rotation helps farmers achieve optimum crop production. Results will show if the samples are stripped of necessary nutrients or if the farmer did not rotate the crops on a regular basis. These samples will be tested to see what nutrients are left behind that could potentially affect the crop yield. Samples from the standard yard will act as the control sample of which soybean and corn field samples will be compared. Testing will be completed using a Scanning Electron Microscope (SEM) for magnifications ranging from a naked eye view to approximately 1.9K magnification. Results from this research will compare physical properties and chemical compositions between the samples. Chemical compositions of different soil samples will show what nutrients are left by previous crops. Preliminary results show qualitative physical differences between the soybean and corn soil; the soybean soil is lighter in color compared to the corn soil. The presentation of this research will contain images and tables from the SEM along with a map for where soil samples were collected. Included will be an outline

of physical and chemical comparisons found between the corn, soybean, and standard yard soil samples.

IS BIGGER REALLY BETTER?: NEST SIZE DOESN'T INFLUENCE FEMALE MATE CHOICE IN THREESPINE STICKLEBACK (GASTEROSTEUS ACULEATUS)
Savannah Foster
Category: Environmental Science and Natural Resources, Section 2
Poster: 208
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Emily Weigel (Zoology)

A variety of species use nests to raise their young. In the Threespine stickleback, Gasterosteus aculeatus, a freshwater fish species, the female selects her mate based on certain criteria including the male's nest. Males spend a significant amount of time and resources building nests, courting females, and caring for young. The central question of our study is to ask how females might assess male nests as a part of courtship. Might larger sized nests attract more females and increase a male's chance of success in the mating season? To test this, we enticed males daily to build nests (N=143) from April to August 2013. Males who completed nests (N=122) were placed in a three-day rotation of no choice trials with females that were ready to deposit eggs. We measured nest quality (weight, area and perimeter), nuptial coloration intensity, and courtship patterns. Our results strongly indicate that larger nests alone did not predict success rates with females ($p=0.4632$), however nest perimeter and area are reliable indicators of nest size, as measured by weight ($p=0.0001$, $p<0.0001$, respectively). Thus nest size alone is not predictive of success, but it is possible that females can reliably predict nest size through visual cues. In future studies it would be beneficial to manipulate nest sizes to test how significantly nest size affects both male success with females and ultimately success in raising young.

THE LONG TERM EFFECTS OF ROOT DAMAGE ON THE GROWTH OF RED OAKS
Shane Jennings
Category: Environmental Science and Natural Resources, Section 2
Poster: 209
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Frank Telewski (Plant Biology)

This research is a long term, observational study looking at the recovery of Red Oaks (Quercus rubra L.) located on the Michigan State University campus following significant root damage cause by trenching during a construction project in 1993. This investigation is a replication of a unpublished study at Michigan State University in 2003 which indicated that 10 years following the initial root damage, tree growth had not fully recovered when compared to the control. Previous data were combined with data from tree cores sampled in the winter of 2013. Dendrochronological analysis, tree ring dating, allowed us to look into the past 20 years of yearly growth patterns and analyze the negative growth impacts caused by trenching. Tree ring widths were analyzed with ARSTAN, a dendrochronology software. A 32 year smoothing spline was applied. Results of the current study do not replicate the analysis performed during the 2003 study. Instead of observing no recovery, our current results suggest the damaged trees recovered to normal growth in approximately four years. Further analyses of individual tree recovery as a result of proximity to trenching are currently being investigated.

WORMS EAT MY GARBAGE: ASSESSING THE ENVIRONMENTAL AND SOCIAL IMPACTS OF VERMICOMPOSTING IN THE BRODY NEIGHBORHOOD AT MICHIGAN STATE UNIVERSITY
Jacob Brekke, Elizabeth Brajevich, Eamon Devlin, Issac Ross
Category: Environmental Science and Natural Resources, Section 2
Poster: 210
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): John Biernbaum (Horticulture), Laurie Thorp (RISE)

Food waste is a growing problem in America while global soil quality continues to decrease. Much of our nation's uneaten food is going into landfills, where it produces methane–a potent greenhouse gas–as it decomposes. Vermicomposting is a biological process in which worms and microorganisms are used to digest food scraps that are excreted as nutrient rich castings. These castings can be used to return minerals back to farms, reducing the need for synthetic fertilizers, saving energy and resources and improve global soil quality. Our goals were to assess how well we raised awareness within Brody neighborhood about life-cycle processes and the importance of sustainable food systems, while reducing MSU's contribution to continuously growing landfills. During the first project phase, an online survey administered at Brody Square assessed students' attitudes, skills, and knowledge in regards to sustainability and vermicomposting. In the spring of 2014, the survey was re-administered via the online survey software to compare with our baseline data. The analysis of our results assess the effectiveness of our vermicomposting outreach including vermicomposting workshops. Additionally we collected data on the total amount of waste composted, worm bin conditions, and the impact this project has had on the environment. As a public, research-intensive land grant university, MSU should lead the way in innovative and sustainable solutions. By disseminating data on how we were able to impact students and how much waste we diverted from landfills we can inform the university of the positive impact our vermicomposting program has generated.

POSTER PRESENTATIONS, SECTION 3

THE RESPONSE OF PONDEROSA PINES PINUS ARIZONICA AND TAXON X TO ENVIRONMENTAL STRESSORS
Ginger Thurston
Category: Environmental Science and Natural Resources, Section 3
Poster: 213
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Frank Telewski (Plant Biology)

Variables in an environment, such as temperature and precipitation, can affect the growth of tree species, resulting in tree ring width variations. The study of these variations, or Dendrochronology, has many implications, from climatological reconstructions to outbreak cycle tracking. Dendrochronology can also be used to determine if a tree species is responsive to a specific environmental condition and whether the species responds negatively or positively to this condition. Our study used such dendrochronology techniques to determine the respective limiting factors for two species of pine, Pinus arizonica and Taxon X, occupying a contact zone along an elevational gradient in the Santa Catalina mountain range of Arizona. We were specifically trying to determine if temperature was preventing P. arizonica from growing at higher elevations and if precipitation was preventing Taxon X from growing at lower elevations. Our initial results showed P. arizonica and Taxon X responded positively to July precipitation. Both species responded negatively to high temperature in summer months, but Taxon X had a stronger response, and included an additional negative response to high April temperatures. Weak climatological correlations in our results suggest that we should divide each species sample further into two age classes in order to better standardize our chronologies and improve correlation. We will continue further analyses to conclude how each species and age class responds to the climate variables, and we believe this may help resolve why the contact zone is the upper elevational limit for P. Arizonica and the lower elevational limit for Taxon X.

MIGRATORY FLIGHT CALLS OF CAPTIVE BLUE-WINGED TEALS
Brittney Andre
Category: Environmental Science and Natural Resources, Section 3
Poster: 214
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jen Owen (Fisheries and Wildlife)

In the wild, migratory birds have been known to increase the amount of flight calls they make before and during migration. Because bird migratory behavior can also be studied under controlled conditions in captivity, we can use a similar experimental design to also study flight calls. Most research on captive migration behavior has been conducted on landbirds with little work done studying migratory behavior of waterfowl; the same is true for past studies researching flight calls for waterfowl. We hypothesized that captive Blue-winged Teals (Anas discors) would experience a change in calling during pre-migration, migration, and post-migration periods. For our study, we had an experimental group and a control group of Blue-winged Teals. The experimental group was photoadvanced to stimulate the changing sunset/sunrise they would naturally experience if migrating in the wild. The control group was not photoadvanced. Each group had an audio recorder that recorded sounds during the night. For each period, we are analyzing the audio recordings, focusing on the call type, duration, and the number of notes the call is composed of. From this we can deduce if and how their calling behavior changed over the periods compared to the control. We expect not only to see an increase in the amount of calling in the experimental group, but also an increase in notes, duration, and the amount of different types of calls made. On the other hand, we do not expect the control room to experience any of these changes.

CARBON SEQUESTRATION: DEVELOPING A LEARNING ACTIVITY FOR STUDY ABROAD AND UNDERGRADUATE CURRICULUM
Kelsey VandeWetering, Katie Lindholm, Julia Miller, Connor Watt
Category: Environmental Science and Natural Resources, Section 3
Poster: 215
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Gabriel Ording (Entomology), Pamela Rasmussen (Zoology)

Carbon sequestration is a measurable ecological phenomenon with a variety of global implications. This can be studied through a small scale activity which can be utilized and implemented in study abroad programs and undergraduate curriculum. This research serves as an introduction to other important issues such as global warming and carbon credits. Carbon is becoming a global commodity, as the amount of carbon trees can sequester begins to have a measurable price tag due to rising efforts to control global warming. We used a quadrat sampling method to collect data from 10 randomly chosen sites in Baker Woodlot on the MSU campus. This was compared with collective data taken from the Wild Borneo study abroad in 2013. Statistical analysis was conducted to determine the amount of carbon individual trees can hold and ultimately the estimated amount an entire forest ecosystem could contain. This technique can also be applied when pursuing reforestation in a variety of contexts. We will present our data and the results of our analysis in a poster format with

explanations for our findings and potential implications for future research. This investigation will help to create a carbon sequestration activity applicable to many undergraduate laboratories and other study abroad programs, allowing us to potentially track individual trees or ecosystems over extended periods of time. This activity can also be used to get students thinking more globally about the effects of deforestation, the burning of fossil fuels and the value of being able to assess and quantify carbon sequestration.

UNDERSTANDING CURRENT AND HISTORICAL HYDROLOGY OF THE BOARDMAN-CHARLEVOIX AND JORDAN WATERSHEDS
Laura Bailey
Category: Environmental Science and Natural Resources, Section 3
Poster: 216
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Anthony Kendall (Geological Sciences), Sherry Martin (Geological Sciences)

The United States Fisheries and Wildlife Service has been collecting data from over two hundred rivers in Michigan since the early 1960's. This dataset is the oldest and most comprehensive for many rivers of Michigan. This project focuses on the Boardman-Charlevoix and Jordan Watersheds and the major water bodies within these systems. Digitization of USFWS field notes compiled into a comprehensive database, allow for a more robust data management and accessibility of large datasets. In order to understand the hydrology and analyze the changes over time, the database is used as an input for the Integrated Landscape Hydrology Model (ILHM). The ILHM simulates hydrologic cycles with a wide array of parameters including climate and this model will be used to further understand the Boardman-Charlevoix and Jordan watersheds. Furthermore, the methods for data extracting, compiling, and analyzing used in this project can help format ongoing and future projects where historical stream data is needed.

CLOGGING POTENTIAL OF WETLAND TREATMENT SYSTEM FOR AGRICULTURAL WASTE WATER
Charlotte Thomas
Category: Environmental Science and Natural Resources, Section 3
Poster: 217
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)

Effectively treating agricultural waste water at a cost efficient price has been an increasing problem. To combat this problem, a wetland system was constructed to create a cheap waste water treatment option for farmers. The wetland uses Michigan dairy waste water to test with. The system has been in use for three years and has not undergone major problems. To prove that clogging will not be an issue with the system, a double ring infiltrometer will be used to conduct a percolation test on the soil surface as well as 1.5 feet below the surface. The reason for doing the test in two depths is during the summer months waste water is applied on the soil surface, but in the winter months the waste is applied 1.5 feet below the surface to avoid freezing problems in the cold. The percolation test will simulate a falling head test to measure how quickly water flows through the soil. With this data, concerns for failure of the wetland treatment system due to clogging will be eased.

MANAGING PHOSPHORUS: MODELING ADSORPTION CAPACITY USING A LANGMUIR ISOTHERM
Jacqueline Thelen
Category: Environmental Science and Natural Resources, Section 3
Poster: 218
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Steven Safferman (Biosystems and Agricultural Engineering)

Nutrient-dense materials, such as raw sewage and fertilizer runoff, have been increasingly impacting natural aquatic environments. Ecosystems with high nutrient concentrations harbor immense algae growth that can deplete water and oxygen supplies, reduce water quality, and create health risks for animals and humans alike. Since the cost of maintaining these algal blooms is so high, management of this issue has emphasized the regulation of phosphorus entering the environment. Adsorption is a unique phosphorus removal technique that uses chemical reactions constrained on nanomaterial. The media is designed such that phosphorus sticks to its surface instead of remaining in the liquid. This research concentrates on the adsorption of phosphorus by iron oxide nanomedia from sanitary wastewater. To develop an economical system of removing phosphorus from wastewater, the maximum adsorption capacity of the media must be well-established and easily calculated. Isotherm capacity modeling provides a reliable method to measure the equilibrium concentrations that describe adsorption capacities of different media. In these experiments, different masses of the iron oxide media were suspended in different containers of wastewater and allowed to react until the phosphorus concentrations stabilized at the equilibrium point. By modeling these equilibrium concentrations using a Langmuir Isotherm, the adsorption capacity of the media was efficiently calculated. In this presentation, detailed descriptions of these methods and their results will be displayed along with an in-depth analysis of their effectiveness and practical applications to reduce nutrient pollution and protect aquatic ecosystems from further damage.

CAN BIOCHAR AMENDMENTS FACILITATE CHRISTMAS TREE PRODUCTION IN MICHIGAN'S SANDY SOILS?
Jonathan Huck
Category: Environmental Science and Natural Resources, Section 3
Poster: 219
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jessica Miesel (Foresty)

The low clay and organic matter content of Michigan's sandy, well-drained soils contribute to low water-holding capacity, nutrient loss via leaching, and crop susceptibility to drought. Recent periods of prolonged drought have had major economic impacts on Michigan's Christmas tree industry, calling for an investigation of potential interventions to address this problem. Biochar is a porous charcoal byproduct from the gasification of biomass for bioenergy, and has shown great promise as a soil amendment for increasing soil water content, nutrient availability and plant growth. However, specific effects depend on biochar characteristics, soil type, and plant species, and it is important to evaluate each combination before widespread use. We applied four levels of biochar to two textures of sandy soil to evaluate biochar effects on soil moisture content, nutrient loss via leaching, and plant biomass for Fraser fir (Abies fraseri) and Colorado blue spruce (Picea pungens), two of the primary Christmas tree and landscaping species produced in Michigan. Preliminary results show that soil moisture content increased with biochar application level. Biochar effects on nutrient leaching will be presented. This project will provide important data for developing appropriate biochar application guidelines for Michigan agricultural soils.

GRAPHIC DESIGN

POSTER PRESENTATIONS, SECTION 1

PIZZAZZ: THE PIZZA MAKER
Kevin Marquardt
Category: Graphic Design, Section 1
Poster: 220
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

Making a pizza is a pretty straightforward process. But making a good pizza is something altogether different. The purpose of this app is to give people an accessible and entertaining way to create gourmet pizzas. The goal is to walk the user through the seemingly daunting parts of creating a pizza from scratch and allow them to create a unique pie within a variety of styles. The breaking down of the more complex methods into digestible portions will also allow users to experiment and create unique pizzas for themselves. While interacting with the app, the user will be exposed to and learn advanced cooking techniques that are not just reserved for pizza. Through the continued use of this app, users will not only gain knowledge about pizza making, but also learn cooking techniques that are applicable to other methods of cooking. The app offers a variety of pre-loaded options for quick pizza creation as well as an option to create and save a topping list for the ultimate personal pizza. Allowing for growth and customization in the app will keep the user coming back to it as a reference as well as encourage experimentation.

"GEAR GUIDE"- AN INTERACTIVE DASHBOARD FOR BIKE COMMUTERS
Rachel Matero
Category: Graphic Design, Section 1
Poster: 221
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

The purpose of this Smartphone application is to enable bike commuters to more easily plan travel routes and predict conditions on bike paths. The main feature of the app is the map that not only shows nearby roads and bike paths, but also chooses the best route for the user by taking into account traffic patterns depending on the time of day and current road conditions. Salt and plow trucks will be connected to a server via Bluetooth to report which roads and pathways have been cleared, and which remain icy. This enables the user the safest and most efficient route possible. Other aspects of this application include a weather feature that shows current conditions and recommends accompanying clothing it deems appropriate. Also, the application tracks distance traveled by the user and has the ability to sync with his or her music library. Overall, the purpose of this dashboard is to make handy a variety of things bike commuters take into account before ever leaving home. The information this application displays in one simple dashboard is crucial information to the safety and convenience of bike commuting. Without this app, information such as weather must be physically ascertained, or collected from a third party site. Also, road conditions are not predictable until on location, which makes it difficult to decide if it is safe to ride at all. This dashboard will be extremely helpful in giving bike commuters the information necessary to make informed and educated decisions.

E-Z FIX: AN APP FOR MINOR CAR REPAIRS
Claire Brodie
Category: Graphic Design, Section 1
Poster: 222
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

The majority of the population does not know how to change minor fixes on their car, such as headlights, air filter, and more. Owners manuals and YouTube videos can be helpful to an extent, but they are lacking information and are not easily accessible. E-Z FIX is an interactive tool that provides quick access to concise information specific to ones car. The user begins by entering the make, model, and year of ones car and then a personalized home screen will appear with the top easy fixes for ones car. The examples below show how easy it is to navigate through the information. The opportunity this app provides is informing the general public with specific steps on how to repair different areas of the car. Purchasing of the part that is broken or empty is required. E-Z FIX provides a picture and the specific type of product one will need. A search area to find an auto parts store near the users current location is located at the bottom of the screen. Also the commonly asked questions button and ask for help button for any troubleshooting is located at the bottom. Owners Manuals give the user information on the steps on what one is trying to fix, but the manual lacks the multiple steps that make up the general step. Through pictures of each step, E-Z FIX fills those holes. E-Z fix helps one through each step of the process all in the convenience of ones pocket.

BAKERAM: A HOT YOGA APPLICATION
Courtney Russ
Category: Graphic Design, Section 1
Poster: 223
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

Founded by Yogiraj Bikram Choudhury, Bikram Yoga – often referred to as Hot Yoga, is devised of 26 posture sequences and two breathing exercises. It is a workout that flushes the body of toxins and helps in curing a multitude of afflictions. Designed for all ages, Bikram Yoga systematically works every part of the body to maintain optimum health and function. Through the use of methods used in interaction design practices, I developed an iPad application titled Bakeram. This app is designed to encourage those to test their limits and reap the benefits of practicing yoga on a regular basis. Given the extreme nature of Hot Yoga, Bakeram breaks down the workout into three 90-minute level classes that range from easy to hard – ensuring that each class is specifically tailored to the user's abilities. By using Bakeram, beginner and experienced yogis receive an informal rundown of their specific workout level, a posture overview, and instructional videos to help gear them for their class. Furthermore, the app creates a safety net for the user by providing pre and post workout requirements to guarantee their well-being. With a created profile, users are given activity and wellness trackers that keep tabs on their progression and bodily improvements. The information is organized into a simple grid format and presented through the minimal use of colors and typefaces. This approach to the interface design of Bakeram helps users select a yoga experience right for them and properly guide them through their muggy workouts.

VIDENO: HELPING VIDEO GAME ADDICTS FORM A MORE PRODUCTIVE LIFESTYLE
Austin Thompson-Truchan
Category: Graphic Design, Section 1
Poster: 224
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

According to Pew Research, 53% of American adults age 18 and older play video games, and 21% play everyday or almost everyday. Video games allow an individual to escape from reality, and transcend into a digital realm away from all stresses. There are many who are addicted to this form of mental diversion. So much so that their real lives become their second reality, and their digital lives become their first. An addiction to video games can cause people to become lazy, irresponsible and unproductive. I have designed an iPhone application that helps video game addicts wean off of video games and form a more productive lifestyle. This application, titled Videno, tracks gameplay statistics and dynamically provides the user with tasks or "Quests", that will encourage users to form new hobbies. By completing Quests, users will receive achievement points and eventually increase in Level. Thus, making the app a game within itself. When you get Videno, it can also be installed as an app on the users favorite platforms (Xbox, Playstation, PC, etc.), and will automatically record gameplay statistics which are then viewable to the user through the iPhone application. Videno was designed with simplicity and elegance in mind to be used by gamers who are experienced with a modern user interface. By designing an immensely simple UI, users are able to see the information they need at an eased glance, and can comfortably progress through the app's procedures, ultimately forming a new productive lifestyle.

EAT ME!
Alexander Cyr
Category: Graphic Design, Section 1
Poster: 225
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

Eat Me! is a cooking assistant designed with the inspired chef in mind, allowing users to collect appetizing recipes, and sort them however they choose. Eat Me! is made to be flexible. Advanced chefs through beginners can find a use to meet their needs. Following my roommate Vince as he cooked, I noted how experimentally he works. He does not stick to any strict recipe, but instead goes off what he feels. For Vince, Eat Me! could be used to keep track of ingredients, and record all the recipes he creates. For someone who has never cooked, Eat Me! could be the tool they need to get started. With all the mouth-watering photos of food, the user can't help but feel motivated to try creating things on their own. When users come across something appealing, they have the option to save it to any custom board they created. These boards can be anything from "desserts" to "pasta", giving the user full control and ease of finding recipes. Users also have the ability to share things they create with the community. The shared experience of interacting through food is a much more meaningful experience than Twitter or Instagram. Users should be motivated to attempt creating food they find, hopefully developing cooking skills over time. Eat Me! is designed to encourage more people to attempt cooking, and give them the opportunity to find interesting meals.

EASY FIT INTERACTIVE DASHBOARD
Emily Krieger
Category: Graphic Design, Section 1
Poster: 226
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

After following my roommate through her workout routine, I created this dashboard to help individuals with their fitness plan. A lot of people do not know that they need to do different workouts to strengthen all the muscles in their body. Doing the same workout every day only works a few muscles and does not give the body time to recover. With this mobile phone application, users will get a different workout every day. It has everything one needs to have a great workout and eliminates the stress of determining what exercises to do. It is created for a mobile phone so it can be accessed anywhere. It would also have a place for all of one's favorite workout music. Another aspect of maintaining a fit lifestyle is healthy eating. The food that one consumes affects the body and the way one strengthens their muscles; this dashboard would provide the user with 3 different healthy recipes per day. This eliminates the problem of countering a great workout with unhealthy food. To help keep track of the food being consumed, there would also be a calorie tracker. The user would be able to add calories so they could easily calculate their caloric intake for the day. For those who are lacking motivation, there is also a feature that would give you an inspirational quote or picture per day.

POSTER PRESENTATIONS, SECTION 2

AN INTERACTIVE COOK BOOK AND SEARCH ENGINE FOR THOSE WHO LIKE TO TRY NEW THINGS
Mariya Avanesyan
Category: Graphic Design, Section 2
Poster: 229
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

My mobile application, "NewChow", serves as a means of inspiration for those who like to make food and try new things. It achieves this mainly by the organizational qualities, and specified search results from which the user may choose. With interactive tabs on the sides of the screen, the application poses a series of potential filter options, or questions, that the user may address in order to find a new recipe. The application achieves this by first asking broad questions, and then progressively narrowing down the options to direct the user to whatever it is they're craving. From there, the user is presented with search results that are tailored by the system's filters. In order to keep the user from becoming distracted or confused as they narrow their search, all tabs are shown at once at all times. In addition to this, any actions that the user completes become stored in the secondary navigation bar, on the right side of the screen. This enables the user to select previous steps. The user can store favorites and do a traditional word for word recipe search. With many things taken into consideration, the application successfully operates as a simple tool that weeds through a plethora of information tailored to the user's tastes and food preferences.

THE DUTY APP: AN INTERACTIVE MOBILE APPLICATION DESIGNED BY AND FOR RESIDENT ASSISTANTS
Krista Pass
Category: Graphic Design, Section 2

Poster: 230
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

My research project looks to improve the process of performing duty tasks typically conducted by Resident Assistants here at Michigan State University. Currently, R.A.'s must record round details in a binder at the front desk after every round, as well as separately write-up incidents in a detailed, online system—referring back to rough notes made during the time the incident occurred. They also have to check out an additional phone, as well as additional keys to hold throughout the night. Through the use of methods and processes of interaction design, I have developed a concept for an iPad application that gives Resident Assistants quick access to all the resources they need in one place. The Duty App is designed to eliminate "after-thought" reports by working organically with the Resident Assistant in current-time through all stages involved in rounds, tracking where he/she is in the building to offer appropriate resources accordingly. The app will also create a more cohesive system by providing a platform for all duty tasks in one device—recording round details, writing reports, locking doors, and communicating with other residence-hall staff and emergency responders. It will also eliminate the use of paper, an additional phone, and numerous keys by having a built-in logging system for incident reports and round details, as well as a built-in phone and automated "set" of keys for the building. The Duty App is designed by and for Resident Assistants at Michigan State University in an effort to better serve the campus community.

EASYGROCERY: AN INTERACTIVE SHOPPING TOOL
Erica Tedesco
Category: Graphic Design, Section 2
Poster: 231
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

In today's tech-savvy society, young adults use their smartphones for almost everything. For managing memos, reminders, and lists – the use of simple pen-and-paper is becoming less and less common. Young adults, busy with work or school, utilize apps that speed up their daily and necessary activities. The objective of my interaction design research project, EasyGrocery, is to simplify the grocery shopping experience for users to quickly find an item and to not leave any items behind. For an audience of young adults, EasyGrocery replaces a physical paper-based grocery list and presents to the user their grocery list in a simple and understandable way that best optimizes the user's time. EasyGrocery assists users in managing their grocery list while navigating the grocery store environment. Using a simple design and color coordination, the app is straightforward and easy to use. Users can add items to their list that will appear on the cue as well as on the grocery store's interactive map. Text recognition allows users to take and upload photos of handwritten lists as well as food labels. Upon capture, the app will add those items to the list. EasyGrocery shows users exactly where specific items are located in the store so no time or frustration is wasted in trying to find a particular item.

OVERVIEW: AN ORGANIZATIONAL APPLICATION
Jenna Gamber
Category: Graphic Design, Section 2
Poster: 232
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

My research in interactive design led me to develop an aide for business professionals to organize their everyday schedule in a structured and easy-to-navigate manner. OVERVIEW understands that a user's schedule can be overwhelming and at times hard to follow or understand. The app is organized into three different pages—Morning, Afternoon, and Evening—to make scheduling and checking notifications fast and simple. When swiped to the left or right, each page displays the user's daily schedule, including appointments and reminders, which can all be planned in advance. This interactive web-based app allows the user to set up alarms for each task, which can also be sent to the user's cellular device or computer. A task's corresponding square will change colors when it has been completed. OVERVIEW acknowledges that there are certain programs a business professional uses and needs everyday in order to make their work day possible, with that in mind, "Email", "Chat", "User Profile", and "Address Book" are featured. OVERVIEW also conveniently features several other helpful categories for the user to explore, ranging from "Maps" to "Social Media", as well as a "Music Player" which allows the user to sync music from their iTunes account. The user is able to decide what categories they want displayed on each page through the "User Profile" settings. Presented in a classically modern color palette with crisp and clear images, OVERVIEW provides users with a professional, yet comprehensible, way to oversee their entire day.

HANDYMAN: THE 'TO-DO' APPLICATION
Francoise Gagnier
Category: Graphic Design, Section 2
Poster: 233
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

Our environment is continually progressing towards a more hands-off approach to completing tasks - using technology to mediate their organization and execution. While this has advantageous aspects, there is a loss of emphasis and worth placed in performing a project by hand. The endless facets of the internet in pair with ubiquitous mobile devices, has fostered a dependence on external programs and services to virtually do our thinking and actions for us. Instead of cooking food, we can simply click on an app and order food to be delivered to our door using GPS. Instead of figuring out how to mend a leaky faucet, we can scroll through pages of reviews for local plumbers to hire. Electronic devices can keep our appointments, log and predict our behavior, and automate all of our interpersonal communication. Is this decreasing our "know-how" by relieving the responsibility of having to do anything ourselves? The aim of my research is to create an app that puts the tools back in our own hands, literally. It functions as a channel of information, to help promote a self-sufficiency seldom that is quickly paling in our modern society. Using Handyman, users can look up step-by-step instructional videos of household repairs and other homesteading skills. They can also use their created profile to keep a catalogue of their current tools and post questions or topic discussions on user-run forums. Handyman users can also submit videos to help change the mode of apps from does-it-for-you, to do-it-yourself.

POCKET MECHANIC: FURTHERING THE INTEGRATION OF TECHNOLOGICAL SYSTEMS
Tia Rogers
Category: Graphic Design, Section 2
Poster: 234
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)
Many car owners find themselves in the position of using a vehicle without possessing the knowledge base to adequately care for it. Through the observation of an individual who attempted to troubleshoot their car's problems and perform other routine, car-maintenance protocols, a user profile was developed and a question was found: how can mobile technology and user interfaces further ease the life of its user, particularly when pertaining to car ownership? This question led to the development of an application that, through communication between a user's car and their phone, would allow for informed decision making about the care and upkeep of a particular vehicle, ultimately easing the stresses of car ownership. This research and its application would extend product life, increase travel safety, and provide statistics useful for buyers and sellers in the motor vehicle market. Additionally, tracking the statistics of a vehicular model would show trends in vehicles produced which, when remotely communicating between car, user, and company, would be helpful for further developing the motor vehicle industry.

POSTER PRESENTATIONS, SECTION 3

LIVE IT NOW
Jacob Ludolph
Category: Graphic Design, Section 3
Poster: 237
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

Live it now is a project designed around the bubble go-getter, who is always looking to experience something new and exciting. My research for this project began with shadowing a fellow college student throughout the day. After classes ended while still shadowing this student, I noticed that he was left with a break in his day in the evening and being the ambitious, restless, college student he was, he had a yearn to get out of his apartment and do something to unwind. The two main factors in him deciding to stay home and sit on the couch were money and time. Being a college student with not a lot of spending money can quickly eliminate some of the options that first come to mind. As for the latter, he had a window of 2 hours before he needed to start work, which made him uneasy about being to ambitious. What Live It Now reaches to produce is a solution for the people who wish to get off the couch and be more active. Providing categories and quick sorting tools coupled with an eventual community of reviewers, the applications goal is to provide the quickest, easiest, and most reliable way of searching your area for something to do. From parks and events, to bars and restaurants, a user of this application would be provided with a tool to help fulfill their sense for adventure.

SHADOW LEAGUE
Chris Jefferies
Category: Graphic Design, Section 3
Poster: 238
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

The integration of technology is steadily becoming the defining feature of the 21st century, combined with a revolutionary new form of communication - social media - and an unheard of level of access to information.
In keeping with this trend, Shadow League, aims to integrate a common recreational activity, billiards, with an electronic format. Wiring a common pool table with cameras and Bluetooth sensors, the App transforms a mobile phone into an

integrated information tracking system, logging turns, shots and data which can be later accessed. Further, the app connects to the cloud, where it displays information about games and leagues, rewarding users for playing and winning and adds another level of connectivity between players, and between customers and table owners (often bars and halls). Further multiplying the power of social media, the App includes functionality for checking in at tables and establishments, sharing scores and bragging about difficult shots which can be posted directly to Facebook and twitter. Bar, hall and club owners will also see an unprecedented level of feedback and analytics about how their customers are using their tables, interacting and spending money. In addition, leagues can be set up to offer in App achievements, store credit and cash prizes.

WORKING HARD AND PLAYING HARD: AN APPLICATION FOR GAMERS INTEGRATING EXPERIENCE AND PLAY
Brean Pavlinak
Category: Graphic Design, Section 3
Poster: 239
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

In a world where we are often over worked we find it necessary to get away as much as we can. For some this is accomplished through playing video games and with how hard they work, they need to play just as hard. Gamers will play for long stretches of time with a variety of games. They work to increase their skill and knowledge of fictional worlds and anonymous interactions. Powerplay is an app developed for these player's in mind. Powerplay's purpose is to increase a player's real time understanding of their ingame score and ranking. It syncs with all game devices that the current user has connected through the internet and wirelessly displays real time statistics and information to their smart phone. Powerplay features Leaderboard statistics as well as levels and scores as the user plays. It also houses current information for ingame achievements allowing one to see accomplishments per game. A friend comparison calculator gives the user direct comparisons of personal statistics to friends statistics such as game play time, kill death ratios, overall completion and items unlocked. Powerplay has a game timer which allows one to set game specific timers for online group gatherings. Powerplay is a tool to effectively help users manage their playtime more efficiently as their lives become more complex.

FLYIT - AN AIRPORT ITINERARY EXPERIENCE
Ashley Brimley
Category: Graphic Design, Section 3
Poster: 240
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

In a digital world, where we rely on technology to show us the way, mobile applications are being developed to take personal planning to the next level. The objective of my research, is to create a digital tool that eases the airport navigation experience. Through methods commonly used in interaction design, I created a concept that provides a positive user experience for a target audience of young to middle-aged adults, who travel intermittently. The FlyIt mobile application is an interactive itinerary that begins when one walks through the doors of the airport making navigation to the desired gate easy and efficient. This app will allow one to access information typically found on a boarding pass, an airport map and more, in one touch. Through the process of wire-framing, a sequence for interaction, combined with knowledge of typography, visuals and grids, I was able to create a conceptual mobile application. The design is a dynamic tile layout that allows the user to access their boarding pass, an interactive airport map, foods and services list, as well as the weather and plane tracker. Also, rather than overloading text onto a small piece of paper such as a boarding pass, FlyIt uses blocks of key information with a simple sans serif typeface, so the user can quickly obtain the necessary indicators. The specific airport information that a user would normally search for in their bags and physical environment is available on one screen with this mobile application.

CAR BUDDY: A MOBILE APPLICATION FOR SMARTPHONES
Armando Vazquez-Escobedo
Category: Graphic Design, Section 3
Poster: 241
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

We live in an age of constant technological discoveries where the main objective to achieve is the creation of objects or products that can enhance a better understanding between individuals and their surroundings. This practical concept inspired me to design an interactive mobile application, which offers relevant information, suggestions and recommendations that make more efficient the use of the automobiles. Car buddy belongs to a new generation of advanced technology that pretends to bring commodity, comfort, assistance, security and orientation to its users. It also, contains interactive maps, live traffic reports, efficient localizations and more. The objective of this project is to reduce stress and fatigue generated by the action of driving. Many of the car accidents that often occur are caused by these two factors in which sometimes the lack of control while driving can produce fatalities or disgraces. During the concept development process, I used two very important steps that allowed me to solve concerns presented at the beginning. The method of wire framing was a very useful step

which functioned as a reference for visual design work and site implementation. The next step was the visual design, a step that permitted me to add graphic elements and create a cohesive whole. Similarly, I carefully chose specific colors that can generate a positive energy and vibe, so the user can maintain a very content attitude.

IHARVEST APPLICATION
Phoenix Bedard
Category: Graphic Design, Section 3
Poster: 242
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rebecca Tegtmeyer (Art, Art History, & Design)

In my research project it explains methods used in the creation of an interactive design. It progressed from observing an activity to wire-framing and creating visual compositions for an application. I decided to develop an iPhone application to assist in team communication during the process of harvesting crops. Communication is key to the teamwork it takes to accomplish a successful day of harvesting out on the fields. The iHarvest app is designed to make a working farmer's day easier, engaging, and efficient. The app would be available to download onto the users' phones to enable easy manipulation when operating large equipment. With a touch of a button the user is able to view the amount of acres harvested, bin levels, time left to reach the elevators, and the exact location of the other production workers. It is a major process to get crops from the field to the storage facility for distribution. Workers communicate between combines, grain carts, and semis to exchange the harvested crops so they can reach storage by the end of the day. That is why the iHarvest app features a message board in which a single worker can make an announcement that will be sent for all other workers to see and respond to immediately. Quick reaction is stimulated by the announcement flashing and each user's iPhone vibrating to catch their attention. This is especially important when the loud machinery can make hearing limited if it were to instead ring for the workers' attention.

KRESGE ART CENTER: WAYFINDING
Francoise GagnierShelby Kroske
Category: Graphic Design, Section 3
Poster: 243
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Kelly Salchow MacArthur (Art, Art History, and Design)

In the fall semester of 2012, a group of 10 students were invited to participate in a Wayfinding Design course, whose goal was to design and begin production of a new signage system for the Kresge Art Center. The standing system was outdated – aesthetically and in content – and also didn't adhere to current ADA (Americans with Disabilities Act) guidelines. The building lacked directional signage and easily seen room numbering, among many other absences of information. To formulate creative solutions to the existing problems, the class members spent the semester doing extensive sketching, rendering, and, in the end, installing some mock pieces. Many elements of the signage system were planned out, including room number signs, directories, and an overall color scheme. The project could not be completely developed and installed within the frame of a single semester, so additional research project was created to finalize the system. Since that course has ended, we have been awarded a grant through the Be Spartan Green Student Project Fund. Using only sustainable, "green" materials throughout the newly designed system, we continue to finalize their installation.

HEALTH, FOOD, & WELLNESS

ORAL PRESENTATIONS, SECTION 1

VALIDITY OF OBJECTIVE AND SUBJECTIVE PHYSICAL ACTIVITY MEASUREMENT DURING PREGNANCY
Cassandra Green
Category: Health, Food, and Wellness, Section 1
Location: MSU Room, 9:00 AM-9:15 AM
Mentor(s): James Pivarnik (Kinesiology)

Few studies have evaluated the comparable validity of popular physical activity (PA) measurement techniques in free-living environments. Consensus on this issue would be valuable to researchers wishing to compare results across studies. PURPOSE: To determine the validity of the SenseWear Armband (SA; kcal/kg/hr), Omron pedometer (PED; steps/day/hr) and Pregnancy Physical Activity Questionnaire (PPAQ; MET.min/week) during pregnancy and postpartum, using two placements of the Actigraph accelerometer (hip (ActH; counts/hr) and ankle (ActA; counts/hr)) as criterion measures. METHODS: Participants (n=20) wore the ActH, ActA, SA, and PED for two consecutive weeks (analysis utilized two-week average) at ~20 and 32 weeks gestation, and 12 weeks postpartum. Participants also completed the PPAQ at each time point. Pearson correlations were used to determine validity (r) of the SA, PED, and PPAQ using both ActH and ActA as criterion measures. RESULTS: Moderate correlation was found between the two Actigraph locations at 20 weeks pregnancy (r=0.53;

p<0.05) and 12 weeks postpartum (r=0.45; p<0.05) but not 32 weeks pregnancy (r=0.05). PED was significantly related to both ActH (r=0.71-0.81; p<0.05) and ActA (r=0.52-0.70; p<0.05), except at 32 weeks, where there was no relationship with ActH (r=0.30). In contrast, neither SA nor PPAQ were related to the Actigraphs at any time point (r=0.01-0.20). CONCLUSIONS: Compared to the Actigraph, the Omron pedometer was the only device tested that showed adequate validity when measuring free living PA during pregnancy and postpartum. Placement of Actigraph on ankle should be encouraged when measuring PA late in pregnancy.

CHANGES IN COLLEGIATE ICE HOCKEY PLAYER ANTHROPOMETRICS AND AEROBIC FITNESS OVER THREE DECADES
Amy Ebbing
Category: Health, Food, and Wellness, Section 1
Location: MSU Room, 9:15 AM-9:30 AM
Mentor(s): James Pivarnik (Kinesiology)

Although fitness training has increased in collegiate ice hockey, player anthropometric and fitness profiles have not been evaluated longitudinally. Additionally, it is unknown whether these characteristics differ in athletes who later play in the National Hockey League (NHL). PURPOSE: To describe anthropometric (height, weight, BMI, %fat) and aerobic fitness (VO2max) characteristics of collegiate ice hockey players over 32 years, and to assess whether these characteristics differ in future NHL players. METHODS: Physiologic and anthropometric profiles were obtained through preseason fitness testing of a NCAA Division I men's ice hockey team from 1980-2012. Athletes who later played in the NHL (N=56) were compared to athletes who did not. Descriptive statistics (means, standard deviations) were calculated for overall teams, as well as NHL players. Changes over time were evaluated via regression analysis using linear and polynomial models. Comparisons between average team characteristics and future NHL athletes were assessed via ANOVA. RESULTS: Regression analysis revealed a cubic model best predicted change in mean height (R2=0.60) and weight (R2=0.76), while quadratic and cubic models similarly predicted change in BMI (R2=0.66). No significant changes found for %fat and VO2max over the 32 years. Team averages were slightly, yet significantly (P<0.01) greater for %fat (12.5±1.3 % vs 10.7±3.6 %) and significantly less for VO2max (57.9±1.9 ml.kg-1.min-1 vs 60.4±4.9 ml.kg-1.min-1) compared to future NHL players. We found no differences in heights, weights, or BMI. CONCLUSION: While average player heights and weights fluctuated over time, athletes' relative body fatness and aerobic fitness remained unchanged over time.

RELATIONS AMONG PHYSICAL ACTIVITY AND NAUSEA DURING PREGNANCY
Madeline Stahl, Chris Connolly
Category: Health, Food, and Wellness, Section 1
Location: MSU Room, 9:30 AM-9:45 AM
Mentor(s): Lanay Mudd (Kinesiology)

Nausea and vomiting are common symptoms during pregnancy. These symptoms hinder the ability to perform activities of daily life. Research has shown that physical activity (PA) during pregnancy is beneficial; however, the relationship between PA and nausea and vomiting levels during pregnancy remains unclear. Purpose: To determine the relationships among PA domains (e.g., exercise-related, job-related and household) and nausea and vomiting during the second and third trimesters of pregnancy. Methods: Participants were in their second (n=52) and third trimesters (n=31) of pregnancy. Surveys with questions on demographics, PA during pregnancy (PPAQ), and nausea and vomiting levels during pregnancy (PUQE) were administered. The PPAQ assessed the duration of 36 specified activities and total MET-hr/wk spent in exercise-related, job-related and household PA were calculated. The PUQE assessed current frequency of nausea and vomiting levels (categorized as none or any for each symptom). Mann-Whitney U-tests were used to compare distributions of PA by the presence of nausea and vomiting. Results: Prevalence of nausea (54% vs. 45%) and vomiting (37% and 23%) were higher for women in their second vs. third trimester, respectively. Second trimester women who experienced nausea or vomiting symptoms had significantly higher levels of household and exercise PA (p<0.05). There were no relations between nausea/vomiting and PA in third trimester women. Conclusions: The higher levels of PA observed among second trimester women with nausea and vomiting may be due to the low variability of PA in this sample. Further study with prospective measures and a larger sample is warranted.

EVALUATION OF DIVISION I ICE HOCKEY PRACTICES VIA HEART RATE MONITORING AND DIRECT OBSERVATION: A PILOT PROJECT
Ashley Triplett
Category: Health, Food, and Wellness, Section 1
Location: MSU Room, 9:45 AM-10:00 AM
Mentor(s): James 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 assessments of on-ice practice intensity via HR monitoring and direct observation. METHODS: On-ice practices consisted of high intensity drills 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. A direct observation scale was used to classify intensity into four observation zones (2-5). Percentage of training time spent in each

HR zone and direct observation zone were computed for Monday and Wednesday practices on 4 players. RESULTS: HR telemetry showed 9.4% of Monday practices were spent at 50-59% of HR max, 25.6% at 60-69%, 28.5% at 70-79%, 30.2% at 80-89%, and 6.3% at 90-100%. Direct observation showed 44.5% of practice time was spent at an intensity level of 2, 32.3% at 3, 12.9% at 4, and 10.3% at 5. Wednesday practices showed 34.0% of time was spent at 50-59% of HR max, 24.9% at 60-69%, 18.2% at 70-79%, 18.1% at 80-89%, and 4.8% at 90-100%. Direct observation showed 60.5% of practice time was spent at an intensity level of 2, 23.5% at 3, 10.5% at 4, and 5.5% at 5. CONCLUSION: HR monitoring appears to be a valid indicator of hockey practice intensity, compared to direct observation. Both HR monitoring and direct observation showed that practice time intensity decreased as the week progressed.

POST-INJURY ANXIETY AND SOCIAL SUPPORT AMONG COLLEGE ATHLETES: A COMPARISON BETWEEN ORTHOPAEDIC INJURIES AND CONCUSSIONS
Kristyn Wilhelm, Samantha Belanger, Colin O'Brien
Category: Health, Food, and Wellness, Section 1
Location: MSU Room, 10:00 AM-10:15 AM
Mentor(s): Tracey Covassin (Kinesiology), Bryan Crutcher (Kinesiology)

When an athlete is injured, the primary focus of the sports medicine team is to treat the physical effects of the injury. However, many injured athletes experience negative psychological responses regarding their injury. Therefore, the purpose of this study was to examine anxiety and social support of concussed athletes compared to athletes with orthopaedic injuries. Athletes completed the State-Trait Anxiety Inventory and the modified 6-item Social Support questionnaire prior to injury and one week after recovery. A total of 63 concussion injuries were matched to 63 orthopaedic injuries on athlete sex, sport, and time loss due to injury. The orthopaedic injured group relied on their family for social support 87% of the time, followed by friends (84%), teammates (65%), athletic trainers (57%), and coaches (51%). The concussed group also relied on their family for social support 89% of the time, followed by friends (78%), teammates (65%), athletic trainers (48%), and coaches (47%). No significant differences were found for the Trait Anxiety inventory (t=-1.38, p=.193) and the State Anxiety inventory (t=-1.38, p=.193) between the orthopaedic and concussed groups. Social support satisfaction scores were a significant predictor for post-injury state anxiety. Specifically, increased social support satisfaction scores were statistically associated with decreased post-injury state anxiety (β = -4.21, p=0.0001). In conclusion, we found that both concussed and orthopaedic injured athletes experienced similar state and trait anxiety and relied on similar sources of social support post-injury. Concussed athletes showed more significant predictor models of social support on state anxiety at return to play.

ORAL PRESENTATIONS, SECTION 2

HIGH SCHOOL ATHLETES' SELF-REPORTED KNOWLEDGE OF CONCUSSIONS
Audrey Bentley, Kenneth Hintze
Category: Health, Food, and Wellness, Section 2
Location: MSU Room, 1:15 PM-1:30 PM
Mentor(s): Erica Beidler (Kinesiology), Tracey Covassin (Kinesiology), Jessica Wallace (Kinesiology)

Concussions remain a public health concern, with an estimated 1.6 to 3.8 million sports-related concussions occurring annually. Given the complex nature of this injury, concussions oftentimes go undiagnosed. The failure to recognize a concussion can lead to long-term health deficits and possibly death resulting from second-impact syndrome. It is important that individuals involved in youth sports, including players themselves, recognize the signs and symptoms of a concussion, as well as understand the dangers a concussion can pose. The purpose of this study was to identify sex differences in high school athletes' self-reported knowledge about concussions. Data was collected via a survey of questions regarding concussion history, knowledge, scenarios, signs and symptoms, and reasons why an athlete would not report their concussion. The independent variable was sex (male/female). There were a total of 140(72.7%) male and 45(27.3%) female athletes that completed the survey. The average age of the participant was 15.5±1.19 years old. The majority of athletes were African American(n=80, 48.5%) and Caucasian(n=39, 23.6%). Independent t-tests were completed to determine the difference between male and female self-reported concussion knowledge. Results revealed that sex had a significant effect on the "I know the signs and symptoms of a concussion" item [t(167)=2.02, p=.045], with males reporting a higher mean score (3.66±1.13) compared to females (3.24±1.26). No other items were found to be significantly different between sexes. Overall, the results of this study suggest that there are minimal differences between male and female high school athletes self-reported knowledge about concussions.

HOW CAN DOCTORS DO A GOOD JOB OF INFORMING PATIENTS WITHOUT FALLING BEHIND THEIR SCHEDULES?
Jesse Whitfield
Category: Health, Food, and Wellness, Section 2
Location: MSU Room, 1:30 PM-1:45 PM
Mentor(s): Margaret Holmes-Rovner (Center for Ethics)

Treatment of low-grade prostate cancer is concerning and controversial because neither surgery nor radiation treatment extends life relative to doing nothing. In addition, treatments have various urinary, sexual, and bowel side effects. Patients

need to understand the information doctors present, the possible repercussions and benefits, and participate in shared decision making (SDM). However, many doctors claim lack of time for proper SDM. We investigated this empirically through analysis of audio recording transcripts of initial diagnosis doctor visits. Participants were 252 patients recruited at 4 Veterans Administration (VA) hospitals before their prostate biopsy. Quality of informing was evaluated using the Informed Decision Making (IDM) scale by Braddock, et. al, (score range of 0-18). The time in minutes for doctor visits was obtained from initial audio recordings. Both IDM scores and the visit times were highly variable. The IDM scores (range 0-15), indicate physician performance from poor to excellent. The mean IDM score displays fair quality (IDM M±SD=7.63±2.47). Doctor visits ranged from 6 to 59 minutes (min. M±SD =23±10). The correlation for the entire group between Time and IDM score was 0.257. This low correlation implies that discussion quality is unrelated to time taken to discuss the biopsy results and reach a treatment decision. However, even the transcripts with the highest IDM scores lack at least one essential expected element. We will present qualitative analysis to be completed by March 31, 2014 to describe the discussion style of the most and least effective transcripts to better understand what makes them different.

THE INFLUENCE OF EXERCISE ON MICROVASCULAR FUNCTION IN AGING
Mitchell Rozman
Category: Health, Food, and Wellness, Section 2
Location: MSU Room, 1:45 PM-2:00 PM
Mentor(s): Jill Slade (Radiology)

Initial vascular responses are pivotal in vascular control and function. Reduced or delayed vascular responses may affect tissue perfusion and muscle function. Further, these may be related to age related declines in muscle function. Of particular importance, slower or blunted early hemodynamic responses may contribute to altered perception of physical work and exercise ability. The purpose of this study is to examine the effect of exercise on initial peripheral blood flow responses in older adults. Brief single contractions of the anterior leg compartment were used to evoke functional blood flow responses in the anterior tibial artery. Magnetic Resonance Imaging and Ultrasound was used to measure blood flow immediately following single maximal leg contractions. Blood flow responses were compared before and after aerobic exercise training in older sedentary adults. This will evaluate the impact of exercise training on the muscle BOLD response. Muscle BOLD is an important measure because it reflects muscle perfusion. We suggest that this is an important parameter that is lost with aging but may be improved with exercise.

THE EFFECTS OF CHOCOLATE ON THE MIND AND BODY
Kelly Shashlo, Marlee Anderson, Lauren Hoogerland, Allie Renko
Category: Health, Food, and Wellness, Section 2
Location: MSU Room, 2:00 PM-2:15 PM
Mentor(s): Teresa Barry (Writing, Rhetoric, & American Cultures)

Dating back to ancient times, chocolate has been a remedy used to treat various health issues, and scientists are currently experimenting to determine whether chocolate can be used to treat Alzheimer's disease and dementia as well as health repercussions associated with these. It is important to understand, however, that not all chocolate is healthy. Dark chocolate is the healthiest type of chocolate because it is highest in flavanol content. Flavanol is an important chemical in chocolate that is essential in improving one's health because it improves blood flow to the brain and helps lower blood pressure. Studies conducted by Penn State University, the European Society of Cardiology, and Swedish researchers have all shown a common result: chocolate effectively helps to regulate high blood pressure, control diabetes, and prevent strokes. Another study conducted by the American Academy of Neurology concluded that the consumption of a certain amount of cocoa per day will improve cognitive functioning. Scientists are continuing to look into the effects chocolate has on the brain and body in hopes of using this as a way to reduce risks of Alzheimer's and dementia, as well as the health problems related to the diseases.

PERCEIVED FACTORS INFLUENCING DIETARY ACCULTURATION IN 1ST AND 2ND GENERATION ASIAN INDIANS
Vidisha Paranjpe
Category: Health, Food, and Wellness, Section 2
Location: MSU Room, 2:15 PM-2:30 PM
Mentor(s): Lorraine Weatherspoon (Food Science and Human Nutrition)

My research will examine the types of food consumed and nutrient composition of a pilot sample of approximately 40 Asian Indians in Michigan. I am interested in differentiating weekday and weekend consumption patterns. Most importantly I am interested in differentiating between first and second generation Asian Indians. With the information I collect I will determine if one particular group is more likely to be susceptible to chronic diseases. I will gather data by conducting focus groups consisting of 4-6 participants, then administer two typical 24 hour recalls. Nutrient analysis of the food will be done by using Nutritionist Pro software to examine total calories, carbohydrates, protein, fat, and micro-nutrient composition of participant's diet. The dietary acculturation tool that will be used is specific for Asian Indians, which measures dietary changes on a 5 point likert scale (1=traditional..5=host country behaviors). In conclusion the study on Asian Indians in

Michigan will document weekday and weekend dietary patterns and nutrient composition of participant's diets along with their dietary acculturation level and the future risk of developing chronic diseases.

PREGNANCY INTERVAL, BIRTH ORDER, AND SELF-REPORTED ANEMIA - MI PRAMS 2009-11
Karalyn Kiessling
Category: Health, Food, and Wellness, Section 2
Location: MSU Room, 2:30 PM-2:45 PM
Mentor(s): Cristin Larder (Michigan Department of Community Health)

In theory, a short interval between birth and conception is associated with nutritional depletion which leads to maternal anemia. Many studies have attempted to determine the relationship between birth interval and maternal anemia, with varying results. This study will determine the relationship between interpregnancy intervals and self-reported anemia during the 3 months before conception in the State of Michigan. In addition, this study will explore the relationship between birth order and the prior two variables. A secondary analysis of the 2009, 2010, and 2011 Michigan PRAMS datasets using SUDAAN and 95% confidence intervals. Over 3000 women with a previous live birth comprise the sample taken from the PRAMS datasets. Overall 12.49% (95% CI 11.29-13.79) of women reported anemia in the three months before pregnancy. Women with an interpregnancy interval of <18 months had an anemia rate of 15.04% (CI 13.10-17.20), interval of 18-24 months had a rate of 6.28% (CI 4.06-9.61), interval of >24 months had a rate of 11.29% (CI 9.62-13.22), and an interval of >18 months had a rate of 10.38% (CI 8.93-12.04). There is statistical significance in anemia when the child is the fourth (or more; 15.68%, CI 13.26-18.45) or fifth (or more; 18.98%, CI 15.44-23.11) in birth order as compared to second (11.17%, CI 9.45-13.16). No other birth order relationships were significant. In our sample mothers with a shorter interpregnancy period were more likely to have anemia prior to pregnancy. Also, women with more children are more likely to report anemia.

POSTER PRESENTATIONS, SECTION 1

BIOETHICS OF PSYCHOTROPIC DRUG PRESCRIPTION IN CHILDREN AND ADOLESCENTS
Morgan Burnette
Category: Health, Food, and Wellness, Section 1
Poster: 245
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Dilshani Sarathchandra (Lyman Briggs College)

Over the past few decades the use of psychotropic drugs in society has increased substantially. Psychotropic drugs affect brain activities associated with mental processes and behaviors. These drugs include anti-psychotics, antidepressants, anxiety drugs, and hypnotics. Psychotropic drugs have serious side effects associated with them, as well as risk of dependency and addiction. Even with the serious side effects, the amount of people taking these drugs is increasing rapidly. Doctors are choosing to prescribe these drugs as opposed to psychotherapy because it is much easier and cost effective to the individual. People taking these drugs have a greater risk of relapse than those who are treated with psychotherapy because they do not learn to cope with their disorder. Even though doctors may know the side effects and risks of these drugs, why do they continue to prescribe them? In this research I will analyze the ethical dimensions of psychotropic drug prescription among children and adolescence in the U.S. Using the ICPSR 2012 National Survey on Drug Use and Health dataset, I will conduct a secondary data analysis to identify prescription drug use patterns among children and adolescence and its prevalence in society. The findings will shed light on aspects of increased medicalization of society.

MATERNAL CONTROL IN INFANT FEEDING AMONG ETHNICALLY DIVERSE MINORITY POPULATIONS
Kelly Kenyon
Category: Health, Food, and Wellness, Section 1
Poster: 246
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Mildred Horodynski (Nursing)

A disproportionate number of overweight/obese American children come from minority and low socioeconomic groups. Few studies have compared feeding behavior across ethnic populations, and this disparity calls for greater research and understanding of environmental, social and cultural contributing factors. High levels of maternal control in infant feeding are associated with decreased infant satiety cues, increased obesity risk, and maladaptive eating patterns. Secondary data from a larger study were used to identify and compare behaviors. Mothers responded to statements: (a) "It's important for the parents to decide how much the baby should eat", (b) "It's important that the baby finishes all of the milk in the bottle", and (c) "It's important to encourage the baby to eat". Data analysis compared statement agreement by ethnicity. Among 547 low-income mothers of infants, 230 participants self-identified as African American (42%), 215 as Hispanic/Latina (39%), and 102 as Caucasian (19%). Results showed that minority groups exhibited higher levels of maternal control than Caucasian mothers. More African American mothers believed parents should decide how much baby eats (53%, n = 147) and more Hispanic mothers agreed than Caucasian mothers (32%, n = 69, 15%, n =15), respectively. Hispanic (46%, n = 99) and African American (43%, n = 99) mothers showed higher agreement with importance of the infant finishing his/her bottle and

encouraging the baby to eat, indicating highly controlled feeding behaviors which may pressure or restrict intake. Interventions should be tailored to specific ethnic groups to achieve healthy infant feeding.

COMPLEMENTARY AND ALTERNATIVE MEDICAL THERAPY USE IN PATIENTS UNDERGOING TREATMENT FOR ADVANCED LUNG CANCER
Alwin David
Category: Health, Food, and Wellness, Section 1
Poster: 247
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Lehto (Nursing)

Many patients with cancer use complementary and alternative medicine (CAM) therapies in addition to medical treatments to improve health-related quality of life (HRQOL) and symptom management. It is important for medical professionals to assess CAM usage, particularly used in conjunction with standard, prescribed treatment such as radiation and/or chemotherapy. The study's purpose was to examine the prevalence and type of CAM use in patients receiving treatment for advanced lung cancer. The sample included 40 patients with non-small cell lung cancer [mean age: 66.2 +/- 9.4 years; sex: 27(67.5%) females, 13(32.5%) males; disease stage: III, 10(25%); IV, 30(75%)]. Wyatt's validated 24-item CAM utilization survey was incorporated along with an open-ended question for CAM usage not listed. The patients used a range of 0 to 6 CAM therapies (Mean 1.23 +/- SD 1.77). The most frequently cited CAM choices included vitamins (n=13, 32.5%), music (n=8, 20%), herbs (n=7, 18%), chiropractic treatments (n=3, 8%), and homeopathic remedies (n=3, 8%). When patients were asked about other therapies, 19 (48%) identified prayer, and 3 patients (8%) identified exercise and support groups. Also, women tended to use more CAM therapies; (Mean 1.29 +/- SD 1.46) compared with men 468 (Mean 1.08 +/- SD 1.32). It is essential that medical professionals inquire about CAM usage among advanced lung cancer patients who are receiving standard medical treatment because they may interact with medically prescribed regimens. Importantly, cancer patients may perceive increased quality of life by actively seeking supportive modalities to buttress symptom management during medical treatment.

EXAMINATION OF INTESTINAL CHANGES IN PRE AND POST-MENOPAUSAL MOUSE MODELS
Hayley Bierhalter
Category: Health, Food, and Wellness, Section 1
Poster: 248
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Laura McCabe (Physiology)

The intestinal epithelium is an important selectable permeable barrier against the external environment. Intestinal epithelial cells permit the absorption of nutrients and vitamins, while their cell-cell contacts work to defensively prevent intestinal bacteria and toxins from entering the body and blood stream. . An increase in permeability of this intestinal barrier through reduced cell-cell contacts causes intestinal inflammation and our laboratory is studying how this can affect bone density and health. Data from our laboratory and others suggest that menopause, which is a key risk factor for osteoporosis, could alter the intestinal physiology. The focus of my research project is to identify changes between pre and post-menopausal mouse models. Using microscopy I am measuring and comparing intestinal anatomical features such as villus height and goblet cell numbers between conditions. I am also extracting RNA from sections of the small and large intestine to examine menopause associate changes in gene expression. My preliminary studies suggest that menopause/estrogen deficiency can affect levels of genes associated with cell-cell contacts (gap junctions), inflammation, and epithelial maturation which are consistent with my observed histological changes.

INFLUENCE OF VASCULAR RISK FACTORS ON THE PROGRESSION OF MILD COGNITIVE IMPAIRMENT
Jill Nelson
Category: Health, Food, and Wellness, Section 1
Poster: 249
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Andrea Bozoki (Neurology)

Mild Cognitive Impairment (MCI) is considered a state of transition between normal cognitive function and some form of dementia, often Alzheimer's disease (AD). It is well known that vascular risk factors (VRFs) such as hypertension (HTN), obesity, hyperlipidemia, diabetes, and stroke, are positively associated with the onset of dementia.[1] VRFs have a high prevalence in the United States, particularly in those over the age of 50.[2] Further, recent research has shown that the presence of multiple VRFs may have an additive effect on dementia risk.[3] The goal of this research is to examine changes in these VRFs throughout the course of MCI. In this study, risk factors for dementia such as a high body mass index (BMI > 30) and high blood pressure will be studied. MCI subjects (n = 103) will be analyzed retrospectively up to the point of their conversion to dementia or another diagnosis. For those that converted to AD (n = 30), BMI and hypertension values will be measured up to 12 months after the development of AD. Descriptive statistics will be used to assess whether there is a difference in the mean and median time to conversion of MCI subjects with obesity and HTN throughout MCI compared to

those with normal weight and blood pressure. In addition, a history of type 2 diabetes, hyperlipidemia, and stroke after MCI diagnosis will also be quantified for their presence within these groups. In summary, this study seeks to better understand how VRFs influence the development of dementia.

ANALYSIS OF STARCHES
Elise Robinson
Category: Health, Food, and Wellness, Section 1
Poster: 250
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Per Askeland (Composite Materials & Structures Center), Carl Boehlert (Chemical Engineering & Materials Science)

Starches are polysaccharides that function as carbohydrates and are found in plant tissue. This project will look at quantifying starches in different vegetables. It will also compare starches that are raw to those that have been cooked. Data for this project will be collected using a scanning electron microscope to capture images of the starches.

WHAT ARE HEALTH PROFESSIONALS PERSPECTIVE ON THE QUALITY OF HEALTH CARE IN CLINICS FUNDED BY THE INDIAN HEALTH SERVICE?
Shelbie Shelder
Category: Health, Food, and Wellness, Section 1
Poster: 251
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Anand Nair (Supply Chain Management)

American Indian and Alaskan Natives are the only population in the United States who have a birthright to health care provided by the U.S. Government through the Indian Health Service. The Indian Health Service, developed in 1955 is part of the US Department of Health and Human Services. It's main responsibility is to follow up on the U.S. obligation to provide healthcare to AI/AN through an agreement signed by the federal government and tribes. The Indian Health service is extremely underfunded, which affects the quality of care provided in tribal clinics. According to the Department of Health and Human Services, the per capita expenditures in 2011 budget for AI/AN people receiving healthcare from the IHS were $2,643. In addition, the per capita spending expenditures in 2011 for Medicaid and Medicare recipients were $6,156 and $11,762 respectively. AM/AN suffer disproportionately compared to other races in several health areas. The author offers a close monitoring of quality of care in clinics funded by the IHS through three case studies done in Michigan, South Dakota, and California. This study asks healthcare professionals at the various clinics their perspective on the quality of care.

POSTER PRESENTATIONS, SECTION 2

PERCEIVED BENEFITS AND BARRIERS OF PHYSICAL ACTIVITY PARTICIPATION IN 5TH-7TH GRADE URBAN GIRLS
Christina Mitchell
Category: Health, Food, and Wellness, Section 2
Poster: 254
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Jiying Ling (Nursing), Lorraine Robbins (Nursing), Stacey Wesolek (Nursing)

Information about girls' benefits and barriers of physical activity participation is sparse. This study aimed to examine the perceived benefits and barriers of physical activity among 5th-7th grade girls participating in an ongoing multi-site randomized group trial (2011-2016) that will eventually involve a total of 24 urban schools in the Midwestern U.S. The girls volunteered to take a questionnaire. The percentages of girls who selected "very true" were used to identify the top five benefits and barriers of physical activity. The top five perceived benefits were: (1) to have fun (n = ; 79.2%); (2) to get or keep me in shape (n = ; 71.3%); (3) to be healthier (n = ; 67.2%); (4) to have more energy (n = ; 62.1%); and (5) to prove to myself what I can do physically (n = ; 59.5%). The top five perceived barriers were: (1) I hate to sweat during school day (n = ; 26.5%); (2) I need to have better skills (n = ; 22.8%); (3) it is hard to find physical activity programs or classes I like to do (n = ; 19.6%); (4) I feel embarrassed about the way I look whenever I exercise (n = ; 17.1%); and (5) I have some pain from activity (n = ; 15.5%). Equipped with knowledge of the benefits of and barriers to physical activity, health professionals can tailor their counseling to increase its relevance for girls of this age as a means to increase physical activity.

HOW DOES ALZHEIMER'S DISEASE AFFECT PAIN? AN INVESTIGATION OF BEHAVIORAL AND STRUCTURAL NEUROIMAGING CORRELATES
Jonathan Huck
Category: Health, Food, and Wellness, Section 2
Poster: 255
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Andrea Bozoki (Neurology & Ophthalmology)

Because elderly populations are at higher risk for pain and related symptoms, it is imperative for clinicians and caregivers to make adequate pain assessment and treatment. This can become challenging in the context of Alzheimer's disease (AD), as patients often cannot communicate symptoms. While initial studies suggested AD may reduce pain unpleasantness recent behavioral and neuroimaging studies indicate otherwise necessitating further evaluation of behavioral and neural correlates of pain in AD patients. In this study, we used combination of behavioral testing and structural neuroimaging of healthy seniors (HS) and AD patients with varying severity of illness. Subjects underwent forearm pressure testing (1-5 kg/cm2) during which heart rate (HR), behavioral responses, and when possible, self-report of pain levels were recorded. Behavioral responses were scored with both the Pain Assessment in Advanced Dementia (PAINAD) scale and Facial Action Coding System (FACS), a technique for objectively scoring the intensity and frequency of facial expressions. After behavioral testing, subjects underwent structural MRI scanning. Thickness and volume of specific pain-related regions of interest was computed for both groups. Preliminary results show that, though AD patients had reduced HR responses to mildly and moderately painful stimuli, they showed increased behavioral responses and rated stimuli as more painful than HS. We are currently working toward correlating structural changes of cortical and subcortical brain structures between groups to these behavioral results. The latter will better inform us how changes in brain structure may predispose toward changes in pain experience and behaviors in AD patients.

LIFESTYLE ATTITUDES DURING PREGNANCY
Todd Buckingham, Max Gustin
Category: Health, Food, and Wellness, Section 2
Poster: 256
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lanay Mudd (Kinesiology)

Pregnant women are advised to maintain a healthy balanced diet, rich in vitamins and minerals. A recommended 150 minutes of moderate physical activity has also been shown to positively affect gestation. Current research shows that fewer than 1 in 4 women meet current physical activity guidelines during pregnancy. Development of practices to encourage adequate pre-natal nutrition and physical activity remains of paramount concern, however, little is known about the attitudes of pregnant women towards these health behaviors. The purpose of this study was to understand how pregnant women think and feel about lifestyle habits during pregnancy in order to plan future health interventions to help pregnant women be healthier and have better birth outcomes. Recruitment flyers were distributed to local OBGYN clinics. Participants completed a 90 minute visit on the campus of Michigan State University, during which each participant completed a survey detailing demographics and current diet and physical activity habits. A one-on-one semi-structured interview was then administered to determine attitudes regarding physical activity and diet during pregnancy. Women were categorized as either currently active or not active. Interviews were transcribed and themes were established identifying barriers, sources of information, and social influences to diet and physical activity. Themes will be comparatively examined between women who are currently active and women who are not active. This is a work in progress with results and conclusions to be determined.

OBAMACARE- HOSPITAL'S PERSPECTIVE
Jay Patel, Michael Sterner
Category: Health, Food, and Wellness, Section 2
Poster: 257
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Anand Nair (Supply Chain Management)

As the Patient Protection and Affordable Care Act or "Obamacare" begins its implementation, it has a tremendous impact on the sectors revolving around healthcare. This study looks to delve into the impact that this bill will have upon the hospital in a management perspective. The study examines how the bill modifies the hospital's approach in regards to their nurse-to-patient ratio, staff training and patient admission process. These variables aim to dissect Obamacare's affect as an external institutional force upon the hospital environment.

INTENSE EXERCISE CAUSES HYPERGLYCEMIC AND HYPOGLYCEMIC CONDITIONS IN HEALTHY INDIVIDUALS
Brad Riedinger, Roy Small
Category: Health, Food, and Wellness, Section 2
Poster: 258
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Erica Wehrwein (Physiology)

Moderate exercise is known to increase insulin sensitivity and thus a decrease in plasma glucose concentration. We hypothesized that intense exercise (90% of max heart rate) would cause a decrease in plasma glucose concentrations due to depleted muscle glycogen levels. Five healthy male individuals between the ages 20 and 22 were subject to our intense exercise protocol; subjects maintained 70 RPM on a stationary bike while resistance was increased 10 watts every two minutes. Subjects fasted for 8 hours before the test in order to partially deplete glycogen stores within skeletal muscle. Four glucose concentration measurements were taken: before biking (baseline), at 65% of max HR, at 90% of max HR, and during

a recovery period. Data was analyzed using a one way RM ANOVA with Tukey's posthoc test (reported mean ± SEM). Baseline glucose concentration was 92.4 ± 2.462 mg/dL, 65% max HR glucose concentration was 103.6 ± 6.615 mg/dL, at 90% max HR in was 88.4 ± 7.047 mg/dL, and the recovery glucose concentration was 103.0 ± 5.831 mg/dL. There was significance ($p<0.05$) between baseline and recovery, between recovery and 90%, and between 65% and 90% of max HR. This did not support our hypothesis, overall blood glucose concentration increased after recovering from intense aerobic work. Blood glucose concentrations increased from baseline to 65%, decreased from 65% to 90% of max HR, and then increased during recovery, thus showing the physiological implications to glucose homeostasis during intense exercise despite significant changes between all measurements.

COMMUNICATION IN EXERGAMES: PRONOUN USE AND THE CHEERLEADER EFFECT
Brendan Kennedy, Sarah Kovacs
Category: Health, Food, and Wellness, Section 2
Poster: 259
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Deborah Feltz (Kinesiology), Emery Max (Kinesiology)

Purpose: The ongoing decline of U.S. health has coincided with an increase of average time spent in front of a TV screen (Daley, 2009). In response, exercise video games (exergames) have increased in popularity, though few incorporate group dynamics principles to maximize game effectiveness. One such principle is the Köhler effect, which boosts motivation for weaker group members in conjunctive tasks. This study investigated the effects of pronoun use in verbal encouragement on motivation gains attributed to the Köhler effect in exergames with a virtually present partner and the effect of verbal encouragement on motivation in gameplay alone. Methods: Female and male college students (n = 240) performed two blocks of isometric abdominal plank exercises in one of 5 experimental conditions (individual control, individual with encouragement, partner without encouragement, partner with inclusive encouragement, partner with exclusive encouragement). All participants exercised alone silently in the first exercise block and then received the manipulation corresponding to their condition for the second block. Results: A significant motivation gain was observed when exercising with a partner compared to exercising alone silently ($t(235) = 8.37$, $p < .001$). Encouragement from a virtually present partner did not moderate the Köhler effect. When exercising alone, encouragement boosted exercise motivation ($t(235) = 3.23$, $p = .001$). Conclusion: Exercising with a partner may increase exercise performance regardless of verbal encouragement (whether inclusive, exclusive, or absent entirely). When exercising alone, encouragement may be better than exercising in silence.

POSTER PRESENTATIONS, SECTION 3

DEFENDING THE NEIGHBORHOOD: THE ROLE OF COMMITTEES TO DEFEND THE REVOLUTION IN MODERN CUBAN SOCIETY
Claire Bratzel
Category: Health, Food, and Wellness, Section 3
Poster: 263
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rene Hinojosa (Urban and Regional Planning)

Following the turbulent Cuban Revolution in 1959, the Castro regime created community organizations known as Committees to Defend the Revolution (CDRs). The original purpose of these associations was to keep track of dissidents and possible threats to the government in each neighborhood. The organizations now focus on providing services on a local level, like distributing vaccines and running blood drives. While the associations are still active, participation has waned in the past few years and the CDRs are viewed as a relic of the Revolution. My research focused on the current purpose of the CDRs and their role in providing health services and structuring the community. I visited a museum dedicated to the history of the CDRs and interviewed the director. I also asked Cubans about their views on the CDRs and researched participation in these government programs. Since these associations connect the people to the government and represent the mindset of the Cold War and the Revolution, it is important to examine their place in modern Cuban society. Through this research I explore the current role of the CDRs in Cuba and their future. In my presentation I will draw a link between neighborhood associations in Michigan and the CDRs in Cuba and their roles in the distribution of health information and their abilities to connect people within an area. I will also discuss CDRs as symbols of the Revolution and vestiges of a Cold War mentality.

REMOVAL OF NITRATES FOR BOTTLED WATER PURIFICATION
Nathan Johnson
Category: Health, Food, and Wellness, Section 3
Poster: 264
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rex Lamore (Center for Community Economic Development)

Around the entire world, there exist standards for water before it is deemed healthy and consumable for people. Many ions

and minerals need to be filtered out from groundwater to meet these standards and an important ion, whose over consumption can cause methemoglobinemia, is nitrate. Every water standard limits the amount of nitrates in the water to at most 0.5 micro-grams, while some countries, including the United States, require even lower amounts. Some water bottling facilities in Michigan choose to filter already clean water to remove even more ions from bottled water. In Havana, Cuba, water bottling factories choose only to remove certain ions that are in high concentration, not including nitrates. However, certain types of bottled water in Cuba do have more amounts of nitrates removed. When comparing the Cuban and Michigan bottled water, Michigan's facilities remove much more nitrate ions than the Cuban facilities.

FOOD ACCESS ISSUES IN DETROIT AND HAVANA
Joe Baker
Category: Health, Food, and Wellness, Section 3
Poster: 265
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): James Lucas (Undergraduate Education)

Healthy food access is major problem in areas of Detroit and Havana. The respective governments of these areas are attempting to fix flaws in their food systems. My research was done to find strategies that are being used in the two cities. Ideas could be shared and used in the other communities so people can get healthy food, or in more extreme cases, any food at all. Information was gathered through readings about food systems and sustainability, and with visits to urban farms in Detroit and Havana. The presentation will focus on current programs being used to make food more accessible and find which ones could work for both cities.

BRIDGING THE KNOWLEDGE GAP: DOES BIOLOGICAL HIV KNOWLEDGE ACQUISITION IN THE CLASSROOM CORRELATE WITH INCREASED HIV KNOWLEDGE?
Lestella Bell
Category: Health, Food, and Wellness, Section 3
Poster: 266
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Karen Patricia Williams (Obstetrics, Gynecology & Reproductive Biology)

HIV/AIDS affects Blacks more than any other racial/ ethnic group. Knowledge is an important tool for promoting HIV/AIDS reduction in at risk communities. The 1995 AIDS Knowledge and Attitudes Interview in the National Health Interview Survey conducted by the National Center of Health Statistics suggests that among college aged individuals, Blacks on average estimate a 7.2% lower level of perceived HIV/AIDS knowledge compared to non-Blacks. A study also found that Black college students have lower general HIV/AIDS knowledge than white college students. The purpose of my study is to explore a subset of the community of Black college students, science majors, to see if their exposure to the retro virus in biological science classes correlates to an overall increase in HIV/AIDS knowledge. Based on previous studies on knowledge acquisition, I predict that the exposure to high level knowledge on the biological mechanism of HIV virus and human physiology will correlate with higher levels of general HIV/AIDS knowledge. I will present on my results of a web based survey interview comparing HIV/AIDS knowledge among Black undergraduate students at a major midwestern university. These results will inform not only on the role of disease education outside of traditional HIV/AIDS awareness programs but also highlight the unexplored potential for public health benefits in the education system.

CROSS-CULTURAL CONSUMPTION: A COMPARATIVE STUDY OF DIET AND EATING HABITS IN HAVANA, CUBA AND DETROIT, MICHIGAN
Marissa Musk
Category: Health, Food, and Wellness, Section 3
Poster: 267
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Rex Lamore (Outreach & Engagement Partnerships)

Diet and patterns of consumption play an important role in every individual's life; eating habits determine not only body composition and energy level, but overall health and longevity of life. Despite this information, the importance of a balanced diet and what it is comprised of varies greatly across different cultures and social classes throughout the world. Within my research I will examine the attitudes toward consumption in two prominent cities: Detroit, Michigan and Havana, Cuba. Each city has a population with a comparable life span, but differing views on food based on availability and affordability. I will analyze what exactly individuals in these cities consider a "balanced diet," differences in consumption trends, and how diet plays a role in overall health. I hope to discover patterns between what people eat and their susceptibility to illness and disease, as well as correlations between diet and weight in both cities. The overall goal of this research is to compare the strengths and weaknesses in dietary habits of Detroit and Havana and uncover ways that each city could benefit from the trends of the other.

SATISFACTION WITH A TEXT MESSAGING INTERVENTION FOR CANCER PATIENTS TREATED WITH ORAL AGENTS: A QUALITATIVE ANALYSIS
Sarah Rausch
Category: Health, Food, and Wellness, Section 3
Poster: 268
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Sandra Spoelstra (Nursing)

In the United States 67.5% of adults own cell phones and 98% of phones have text capability. Cancer medications are costly, as much as $800 per pill, and only effective if taken as prescribed. We report on patient satisfaction with text messaging (TM) to prompt taking oral cancer medications and manage their side effects. Ten satisfaction questionnaires from patients prescribed an oral cancer agent enrolled in a 10-week randomized control trial (n=76) examining a 21-day TM intervention to promote medication adherence and management of side effects. We report on thematic analysis of an open-ended question: "Would you recommend TMs as a reminder to take your cancer pills or manage symptoms?" Age was 42-71 years, with mean of 57.9. 80% (n=8) female. 80% (n=8) Caucasian, 10% (n=1) each African American/Black and Hispanic/Latino. 30% (n=3) had breast cancer, 20% (n=2) renal, 20% (n=2) multiple myeloma, 10% (n=1) each lung, kidney, and other. 60% were stage III—IV. Comments recommended TM: "There were times where I would have forgotten to take my pill if it weren't for the texts." And "I felt like someone cared and was watching over me." Patients recommended TM to prompt adherence to oral agents and manage symptoms. Enrollment is ongoing and additional data will be reported. If shown effective, TMs could be instituted as a standard practice for cancer patients prescribed oral agents to promote adherence and symptom management. TMs are convenient for patients by allowing them to manage their care, leading to fewer doctor appointments and hospitalizations.

POSTER PRESENTATIONS, SECTION 4

INVESTIGATING THE MICROVASCULAR FUNCTION OF DIFFERENT SKELETAL MUSCLES WITH FMRI
David Hurley
Category: Health, Food, and Wellness, Section 4
Poster: 271
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Jill Slade (Radiology)

The microvasculature has been shown to be pivotal in the control of both blood flow and tissue perfusion to the skeletal muscles. Recently, the innovation of functional magnetic resonance imaging (fMRI) using blood oxygen level-dependent (BOLD) imaging has advanced a novel, non-invasive approach to assess and quantify changes in peripheral microvascular function and muscle perfusion. Prior studies have observed differences in the BOLD response between different skeletal muscles across all ages. The purpose of this research was to specifically explore and compare the BOLD responses of muscles in both the anterior and posterior compartment of the leg following specific, isolated exercise. This study is significant as there is an emerging consensus in the scientific literature that initial vascular responses to exercise are crucial in vascular control and function. Understanding the differences in the BOLD responses and, ultimately, the microvascular perfusion of these skeletal muscles, could contribute to the growing scientific research on both microvascular and overall muscle function. In addition, investigating these concepts could have clinical applications to help determine why such conditions as peripheral artery disease (PAD) affect certain muscles differently than others. As PAD and other chronic conditions become more prevalent among the aging population, understanding the factors related to poor muscle function is essential.

IMPACT OF INOCULATION PROCEDURES ON THERMAL RESISTANCE OF SALMONELLA IN WHEAT FLOUR AND ASSOCIATED REPEATABILITY OF RESULTS
Sarah Buchholz
Category: Health, Food, and Wellness, Section 4
Poster: 272
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Bradley P Marks (Biosystems and Agricultural Engineering)

Investigation of Salmonella inactivation typically involves inoculation of a matrix. However, most studies focus on the effects of the treatment variable, neglecting to consider the influence of inoculation procedures. The objective was to quantify the impact of inoculation methodology on thermal resistance of Salmonella Enteritidis PT30 in wheat flour, and repeatability in a two-laboratory comparison study. Batches of wheat flour (100 g) were inoculated with Salmonella by five methods: (A) high-concentration, low-liquid volume (HCLV) broth, (B) HCLV suspended lawn, (C) pelleted and resuspended lawn, (D) direct contact with a lawn, and (E) fomite transfer of a lawn. Afterwards, samples were equilibrated to ~0.45 a_w in a controlled-humidity chamber, subjected to isothermal (80°C) treatments in aluminum cells in a water bath, immediately cooled, diluted, plated, and enumerated. D-values were computed from the resulting log CFU/g data by linear regression. Post-equilibration and post-come-up Salmonella populations ranged from 8.7 to 6.3 and 7.7 to 3.7 log CFU/g, respectively. Method A yielded the largest population decline during equilibration (~3 log) and come-up (~2.5 log), and the highest D-value (504.9 s),

compared to the other methods ($P < 0.05$). The MSU-generated D-values for methods B, C, and D were clustered (250.9, 285.9, and 226.7 s, respectively), but statistically different. Based on these findings, careful consideration should be given to the inoculation method, which can significantly impact thermal resistance of Salmonella in low-moisture foods, and the uncertainty, which can significantly affect utility of models.

SYMPTOMS EXPERIENCED BY CANCER PATIENTS TREATED WITH ORAL AGENTS: A QUALITATIVE ANALYSIS
Michelle Wormser
Category: Health, Food, and Wellness, Section 4
Poster: 273
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Sandra Spoelstra (Nursing)

Symptoms experienced by cancer patients undergoing IV treatment are well documented in the literature. However, limited evidence exists on symptoms experienced by those prescribed oral-agents. The aim of this study was to report on symptoms experienced by cancer patients undergoing oral agent treatment. Thirty patients prescribed oral agents completed 5 phone interviews over 8 weeks. A qualitative thematic analysis was conducted on 148 interviews. Mean age was 65; 50% female; 83% Caucasian and 17% African American. 14-types of cancer were experienced; with 90% stage III-IV. Of the 15-commonly reported and most prevalent symptoms, 83% (n=25) experienced fatigue, 83% (n=25) pain, 63% (n=19) numbness/tingling, 53% (n=16) sleep disturbance, 40% (n=12) diarrhea, 37% (n=11) distress, 37% (n=11) swelling of hands and feet, 33% (n=10) lack of appetite, 33% (n=10) shortness-of-breath, 30% (n=9) redness/swelling/pain in hands/feet, 23% (n=7) constipation, 21% (n=6) skin rash/sores, 21% (n=6) nausea/vomiting, 17% (n=5) sores in mouth, and 7% (n=2) fever. We then asked the open-ended question of "What additional symptoms did you experience?" Patients reported 21-other symptoms (5 occurrences of cold symptoms; 4-fluid retention; 3-weakness; 2-each chemo brain, epidermal problems, neuropathy, plugged ears; 1-each imbalance/dizzy, Lymphadema, blood clot, spinal stenosis, weight gain, hair thinning, fall, cough, hiccups, chills, acid-reflux, flu-like-symptoms, elevated BP, restless legs). Clinicians should assess the full array of a cancer patient's symptoms, in addition to those commonly experienced, so that symptom management strategies can be implemented for all symptoms experienced. Effective symptom management is a critical component of successful cancer treatment.

BLOOD FLOW CHANGES FOLLOWING VOLUNTARY VS INVOLUNTARY MUSCLE CONTRACTION
Brandon Wilkinson, John Abraham
Category: Health, Food, and Wellness, Section 4
Poster: 274
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Erica Wehrwein (Physiology)

Blood flow increases following muscle contraction via neural pathways and metabolic factors. However, it is unclear if consciously inducing muscle contraction activates any additional neural pathways that cause increases in blood flow. We hoped to determine whether conscious muscle contraction activates additional sympathoexcitatory pathways to cause increases in blood flow, and if involuntarily electrically stimulating muscle contraction 'bypasses' any of these pathways. 10 young (ages 18-22) men and women (6M/4F) were studied. Caffeine and exercise were restricted the morning before the experiment. An electrode was placed on the ulnar nerve to induce involuntary (externally stimulated) hand contraction for 5 seconds. Subjects held a grip force transducer that measured grip strength. Changes in brachial artery blood flow were measured using ultrasound. Heart rate was recorded throughout experiment. Subject was then asked to grip the force transducer voluntarily (consciously) for 5 seconds with the same strength that involuntary contraction was achieved. Again, blood flow and heart rate were measured. Statistical analysis was performed using paired, one-tailed T-tests. We show there is no statistically significant difference between blood flow increases following voluntary vs involuntary muscle contraction (212.32%±18.98% increase from baseline vs 223.54%±18.87%, $p=0.24$). Heart rate increases following contraction showed no difference between voluntary and involuntary contraction (71.38±2.17 bpm vs 71.13±2.16 bpm before/after involuntary, $p=0.43$; 75.25±2.02 bpm vs 74.71±2.17 bpm before/after voluntary, $p=0.39$). Our results suggest that accumulation of local metabolic factors has the greatest influence on blood flow regulation.

SINGLE BOUTS OF EXERCISE SUSTAIN NEURAL INHIBITION
Alexandra VonBehren
Category: Health, Food, and Wellness, Section 4
Poster: 275
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Matthew Pontifex (Kinesiology)

A growing body of literature suggests that a single bout of exercise may have transient benefits to attention. However, research in this area has only investigated time points following exercise relative to following seated rest. Thus, we have little understanding of the true effects of exercise on attention over time. Using a within-participants design, event-related brain potentials (ERPs) and task performance were assessed in response to a perceptually challenging three-stimulus oddball task immediately prior to and following a bout of exercise or seated rest during two separate, counterbalanced sessions. Findings

revealed that following a single 20 minute bout of exercise, ERP indices of attention were maintained from pre-test. In contrast, reductions in attention were observed following a similar duration of seated rest. These findings replicate previous research observing greater attentional resource allocation and subsequent memory processing after exercise relative to rest. However, contrary to prior interpretations of exercise induced enhancements in attention; these findings indicate that single bouts of exercise appear to sustain such attentional processes reflecting neural inhibition whereas prolonged sitting results in impairments.

THE RELATIONSHIP BETWEEN ACADEMIC SUCCESS IN FEMALE COLLEGE STUDENTS AND NEIGHBORHOOD RECREATIONAL SPORTS USE
Sara Krebs, Matt Hinshaw
Category: Health, Food, and Wellness, Section 4
Poster: 276
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Jim Pivarnik (Kinesiology)

In an effort to improve student academic success, Michigan State University has developed neighborhoods within on-campus residential housing. Neighborhoods provide students with localized health, wellness, and academic resources. Research has shown campus wide recreational sports participation is positively associated with academic success. However, this relationship has not been assessed among students participating in neighborhood specific recreational sports activities. PURPOSE: To determine the differences in semester grade point average (GPA) between neighborhood specific recreational sports group fitness users and non-users. METHODS: Subjects included all female freshmen group fitness users enrolled at MSU in the fall 2013 semester (n=492; 79.1% Caucasian) and a randomly chosen group of nonusers (n=190; 79.4% Caucasian). We stratified by race (Caucasian vs. non-Caucasian) as research indicates a relationship between race and GPA. Means ± SD were calculated for all variables of interest. Mann-Whitney-U tests were utilized to assess differences in semester GPA between users and non-users in Caucasians (n=540; 72% users) and non-Caucasians (n=142; 72.5% users). RESULTS: Overall mean ± SD GPA was 3.30±0.62. Among Caucasian students, semester GPA was significantly higher (p=0.008) in users (3.44±0.51) compared to non-users (3.25±0.62). In contrast, no differences were found in semester GPA between non-Caucasian users (2.98±0.72) and non-users (2.97±0.82). CONCLUSIONS: Caucasian female students who participate in neighborhood specific group fitness may earn higher semester GPAs than Caucasian female students who do not participate. Future research should explore the role of race/ethnicity on student academic success when developing recreational sports programming.

HISTORY, POLITICAL SCIENCE, & ECONOMICS

ORAL PRESENTATIONS, SECTION 1

THE INFLUENCE OF THE RUSSIAN ORTHODOX CHURCH ON CONTEMPORARY RUSSIAN SOCIETY
Joshua Moore
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 11:00 AM-11:15 AM
Mentor(s): Jason Merrill (Russian)

The influence of religion on societies around the world and throughout history is powerful. This is no more true than in the case of the Russian Orthodox Church's influence on contemporary Russian society. Many of the conservative policies that the world has witnessed occur in Russia over the past few years can be better understood if Russian politics are seen to be operating in conjunction with the Russian Orthodox Church, rather than viewing the two parties as completely separate entities. While Russia is a secular nation, there is a significant religious undertone to Russia's domestic and foreign policies. This research seeks to address these influences and predict what this means for the future of Russian politics and society. In order to address such a complex topic, research has been conducted through a variety of methods. News articles, mostly online, were used to provide examples of modern Church influences. In addition to this, discussions with professors and academics regarding this topic are used to provide further context. Research into the traditional influence and history of the Church on Russian politics and society was done through the use of various primary and secondary sources. The Michigan State University library was heavily utilized to provide the proper perspective on the actual power and influence of the Russian Orthodox Church today.

HISTORY OF MEDIEVAL NEUROSCIENCE IN SPAIN
Anzar Abbas
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 11:15 AM-11:30 AM
Mentor(s): John Waller (History)

Since the application of technical medicine by the Greeks, modern neurology has been based on a body of knowledge and

cultural heritage from ancient times. Following the death of Muhammad, Islam enjoyed one of the most spectacular periods of expansion in the history of mankind. Occupation of the cities of Alexandria and Gundishapur put the Arabs into contact with original Greco-Latin manuscrips, which were assimilated and divulged by Islamic scientists in the middle-eastern caliphates of Damascus and Bagdad as well as the western caliphates of Al Andalus (Spain). In this project I review the contribution made by Al Andalus to neuroscience during the Middle Ages and its repercussions on modern neurology. There was a first Spanish cultural Renaissance in Al Andalus during the 9th - 12th centuries, which led to a flowering unheard of in the Middle Ages before then. Andalusian doctors made major contributions to the body of knowledge about neuroscience and developed major philosophical concepts of human understanding. Thus, Abulcasis (936-1013), the father of modern surgery, developed material and technical designs which are still used in neurosurgery. Averroes suggested the existence of Parkinson's syndrome and attributed photoreceptor properties to the retina. Avenzoar described meningitis, intracranial throm- bophlebitis, mediastinal tumours and made contributions to modern neuropharmacology. Maimonides wrote about neuropsychiatric disorders and described rabies and belladonna intoxication. The historical Andalusian period (711-1492) forms one of the most brilliant periods of Spanish neuroscience.

ENSLAVED PRISONERS OF SAINT-DOMINGUE: ORIGINS AND DESTINATIONS
Rachel Yales
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 11:30 AM-11:45 AM
Mentor(s): Liam Brockey (History)

This project was a senior thesis that examined a large sample of prison lists, which report the entry of captured runaway slaves throughout Saint-Domingue, from the 18th century newspaper Les Affiches Américaines. The examination illuminated various aspects of the slave trade and the slave population in the colony – including African ethnicity, gender ratios, the relationship of punishment to marronage, and intent on returning from marronage. The 10,000+ records collected include at a minimum, the name, race, ethnicity, nouveau status, age, prison entry date, and prison and arrest location. More detailed data extraction was completed for a select number of years, noting the slave's height, brands, chains, owner's name, and whether they refused or could not answer questions. Additional records were collected about owners, relatives, and businesses mentioned in the lists. Alongside this data collection, contemporary colonial sources were used to locate historic administrative boundaries and place names to recreate the historical geography of Saint-Domingue using GIS software. By linking the arrest and prison locations of the slaves in the database with the geolocation in the software, spatial analysis on the movement and distribution of the prisoners was completed. The conclusions drawn point out interesting characteristics of marronage in the time period and offer possible directions for future research of marronage in Saint-Domingue. The results are also published on a website (http://yacara15.github.io/), where copies of the database, shapefiles, field descriptions, graphics created from the data, and analytic essay are available.

STARTED FROM THE BOTTOM, NOW WE ARE WHERE: AN INVESTIGATION INTO THE BLACK POLITICAL AGENDA AT MICHIGAN STATE UNIVERSITY
Rachel Tate
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 11:45 AM-12:00 PM
Mentor(s): Emilie Diouf (African-American & African Studies)

The post-civil war reconstruction era, the 1960's civil rights and Black Power Movements marked significant times in American history where the African-American population possessed a cohesive racially focused political agenda. Now after the 2008 presidential election, in which African-Americans turned out in unprecedented numbers, it seems times are changing in ways that are possibly setting the stage for the emergence of a new Black political agenda. Although people questioned if the black vote increased solely for first black presidential candidate I believe the better question would be was there was finally candidate who not only revived but rebuilt the Afro-American political agenda, but to question this would be to define and discover what is the Black political agenda. I focus on the Black agenda through the lense of the Black student community at Michigan State University. Through a series of questionnaires and interview series with various socially active student organizations, such as historically black Greek letter organizations, student unions, as well as the faculty and staff, who advise these organizations, as I explore the political consciousness and social action of the Black student community at Michigan State University. I specifically analyze if and how these organizations identify, create and centralize an agenda inclusive and representative of the Black campus population. By investigating the sociopolitical aims of the black student community at Michigan State University it is my aim that the Black political agenda will find its voice and place within its community once more.

THIRD GRADE READING AND RETENTION POLICIES IN THE UNITED STATES
Hannah Jenuwine
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 12:00 PM-12:15 PM
Mentor(s): Julia Grant (James Madison College)

In the United States, third grade reading proficiency is believed to be an important benchmark in education. The transition from third grade to fourth grade marks the shift from "learning to read" to "reading to learn" other subject material. Also, third grade proficiency has been proven to be an indicator of a student's later academic success. In a 2010 report by the National Assessment of Educational Progress (NAEP), 55% of U.S. students from moderate- and high-income families were not proficient in reading in fourth grade, with 83% of U.S. students from low-income families not proficient. This difference in reading proficiencies by income level highlights and contributes to the educational achievement gap in the United States. Because of this recognition of the importance of early literacy, many states are implementing policies that will retain students who are not proficient in reading by the end of third grade. Some states who have implemented third grade reading retention policies have shown educational improvement. However, retention is a controversial policy, with many studies showing that retained students are more likely to continue poor academic performance and ultimately drop out of high school when compared to similarly low achieving, but socially promoted students (those students who move onto the next grade regardless of poor academic performance). This paper hopes to illuminate alternatives employed by other countries to promote early literacy.

EUROPEAN ENERGY SECURITY: HISTORICAL SHIFTS, CURRENT PROGRESS, AND FUTURE TRENDS
Cody Schulz
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 12:15 PM-12:30 PM
Mentor(s): Norman Graham (James Madison College)

This project analyzes data on significant energy sectors in the United Kingdom, France, Germany, Latvia, and Hungary. It explains historical shifts in types and intensity of energy use, evaluates the current progress by these countries at both achieving energy security as well as meeting EU climate change amelioration goals, and highlights future trends that could impact energy usage. The analysis focuses on UK, French, and German energy policy in a comparative sense, both because the three countries are among the largest energy consumers in Europe and have historically different strategies for achieving energy security. Latvia and Hungary are included to provide maximal contrast between countries pursuing, respectively, renewable energy independence and those who remain dependent primarily on fossil fuels from Russia. The project also includes an evaluation of recent EU-level climate change energy policy developments and their impact on the energy policies and outcomes of the five aforementioned states.

FEEDING THE SHARKS: AN EVALUATION OF FOOD SECURITY GIVEN THE SYSTEM OF CURRENCY BIFURCATION IN URBAN HABANA, CUBA
Margaret Goll
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 12:30 PM-12:45 PM
Mentor(s): Rene Hinojosa (Urban and Regional Planning), Rex LaMore (Outreach & Engagement Partnerships), James Lucas (Undergraduate Education)

Current methods of food provision have not solved food security issues for the island nation of Cuba, despite intensified urban agricultural efforts and recent increases in food imports. There is still a great scarcity of nutritional resources in many urban areas that have experienced the extreme economic distress known as the "special period" during the 1990s. This study focuses on food markets in the Cuban city of Havana, with special consideration given in comparing the purchasing power that locals possess in both currency markets, using the Cuban peso or the convertible peso. Relying primarily on first-hand observations and data collected in Habana, Cuba, the final evaluation is based on specific food products commonly found in the city, with consideration of market type and location. Information collected on each item includes available quantity, quality, variety and pricing information, prices recorded for both currencies when given. Based upon the data collected, early analysis supports an initial postulation that there still exists a dearth of nourishing foodstuffs in urban Habana and Cuba, as a whole. In particular, people who do not have access to the convertible peso currency also have restricted access to food markets and are sustained primarily by inadequate government-issued rations. Further research is necessary to confirm this for urban Habana beyond the limits of Habana Vieja, since the majority of data was restricted to this small geographic area. This evaluation helps to better illustrate the poor status of social welfare that the nation still faces at this time.

TRANSBOUNDARY FISHING CONFLICT IN THE PALK STRAIT: ECONOMIC AND ECOLOGICAL SUSTAINABILITY IMPLICATIONS
Mykala Ford
Category: History, Political Science, and Economics, Section 1
Location: Lake Superior Room, 12:45 PM-1:00 PM
Mentor(s): Mark Axelrod (James Madison College)

The Palk Strait, which is situated between Sri Lanka and India, offers vibrant fishing opportunities, and consequently is also witness to an international conflict over fishing rights. Conflict during the Sri Lankan civil war kept Sri Lankan fishers from utilizing the Palk Strait fishery; therefore Indian fishers could freely access the Palk Bay. With the end of the civil war, Sri Lankan fishers watch as Indian fishers cross into Sri Lankan waters, often using highly destructive gear such as trawlers. This

conflict extends from the international into the local realm with significant impacts on the livelihoods of fishing families. In order to gain an extended understanding of the trends, changes, and developments of the conflict, by the time of my presentation, I will have collected every article over a seven-month period from the local Indian newspaper, The Hindu, regarding this conflict. Throughout this time period, I have seen variations in the level of conflict, allowing me to uncover explanations for why this conflict continues. In my presentation, I will discuss the current negotiations between Sri Lanka and India, their outcomes, the likelihood of a successful resolution, and potential alternative solutions. The resolution to this conflict will have to reconcile economic sustainability and ecological sustainability through an agreement made at the international level but implemented locally.

HUMANITIES & PERFORMING ARTS

ORAL PRESENTATIONS, SECTION 1

THEATRE ENGINE: USING MOBILE DEVICES FOR "MAGICAL" INTERACTION DURING LIVE PERFORMANCE
Emily LaPlante
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room, 9:00 AM-9:15 AM
Mentor(s): Alison Dobbins (Theatre)

In the theatrical arts the audience has a set part to play in any production: the observer. This oral presentation will look at audience influence on a performance through a mobile device connected to the lighting system. The audience members will become part of the performance by controlling sections of the lighting system on a local to global scale. Theatre Engine will attempt to create "magical" interactions where user manipulations are hidden, and the effects are amplified. During a performance, the audience will be invited to control a dancer or the surrounding environment via their mobile device. An example would be a controller, defined as a randomly selected person with control over the environment, discovering a colored light appearing on their screen. When the controller begins to move the cellular device they discover the lights react to their movements, yet each reaction differs slightly to the one before it – creating a continuously changing system for exploration by the audience member. This research will explore how interaction with the lighting system increases the enjoyment of the audience controllers and the observers who did not take have control over the environment. The performance of Theatre Engine will be April 30th.

DISTRACTION IN THE EIGHTEENTH CENTURY
Savannah Smith, Maura Carter, Andrea Parker
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room, 9:15 AM-9:30 AM
Mentor(s): Natalie Phillips (English)

In Charlotte Lennox's work The Female Quixote (1752), the heroine Arabella suffers from an obsession due to the extensive reading of romance novels that causes the characters around her to attribute her feelings provoked by this obsession to "distraction." Examining various historical descriptions and categorizations of mind-states can offer some insights into the evolution of contemporary English usage. By researching the history of "distraction" within the Oxford English Dictionary and finding pertinent usages of it from the Metaphors of Mind database and the Eighteenth Century Collections Online Database, we were able to historicize the use of the term throughout The Female Quixote. Our research demonstrates that "distraction" within the context of the eighteenth-century is often associated with being in a state of madness or the actual intrusion that pulls the mind in many directions, instead of the modern understanding of a state of being unable to pay attention in a situation. Our project also explores the Reading Experiences Database in order to see how eighteenth-century readers of works like The Female Quixote discussed moments of the modern understanding of distraction in order to theorize the evolution of the word "distraction" in contemporary usage. The combined use of "distraction" within primary accounts and popular literature of the eighteenth-century--The Female Quixote offers a new perspective into not only how terminology was used but also how it transformed and became deeply ingrained into today's cultural norms.

SHUNGA: PORNOGRAPHY OR HIGH ART?
Sara Bayer
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room, 9:30 AM-9:45 AM
Mentor(s): Karin Zitzewitz (Art, Art History, and Design)

The period of stability and prosperity brought by the Tokugawa family during the Edo period created the rise of the Chonin class in Edo society. The Chonin class, which was a byproduct of the Tokugawa regime, was the lowest on the strict class hierarchy of Edo-period Japan that began with the Emperor and governmental officials, then Samurai, and then the heavily taxed farmers. The Chonin class greatly appreciated life's pleasures and that belief is exemplified in their art. No greater is that shown that in the famous shunga, which are known for often showing men and women, in some cases courtesans and

their clients explicitly in the throes of passion. The images often depict explicit sexual acts that cause a rift between different scholars' views on what the actual purpose of shunga is. Because of the erotic images and focus of shunga, many scholars consider shunga to be pornographic in nature. However, other scholars see shunga as an important cultural part of Japanese culture. Through this paper I will look at the different arguments between scholars on whether the nature of shunga is one that is erotic and therefore high art, or if it is used for personal sexual stimulus and therefore pornography.

CALLING ALL ACTORS TO THE SCREEN!: VISIBILITY, REPRESENTATION, AND OPPORTUNITY CHALLENGES OF THE BLACK DISABLED WITHIN ENTERTAINMENT
Adia Alli
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room, 9:45 AM-10:00 AM
Mentor(s): Emilie Diouf (African American and African Studies), Michael Wilson (African American and African Studies)

The entertainment industry is an important tool for interpreting reality because of its power to represent, construct, and negotiate the social, political, and economical structures of society. African Americans have particularly been marginalized, and have fought for adequate representations leading to the creation of race specific networks like the Black Entertainment Network. In this study, I argue that despite these efforts, the experiences of physically disabled African Americans are still neglected. According to the 2010 US Census, African Americans hold the highest overall estimated disability rate at 20.3%, but their experiences are underrepresented in entertainment. The purpose of this study is to analyze performance theories of the black body within the domain of the disabled members of the black community. Specifically, I address these three questions: Is there a presence of the black disabled in entertainment, and if so how accurate are their portrayals? What are the psychological and emotional effects these representations, or lack thereof, have on the black disabled, their communities and larger entertainment audiences? Are there professional opportunities for black disabled actors, writers, and directors in the industry? This research not only highlights the gap in academic work surrounding this subject field, but it also encourages efforts and systematic contributions among entertainment professionals, educators, and policy makers to combat this underrepresentation. Revelations from the interviews of black disabled focus groups and their responses to selected movie screenings may offer new ways of understanding marginalization and creating methods of integration in an able-bodied society.

METHODS OF CALL AND RESPONSE IN THEATRE ENGINE
Elizabeth Foland
Category: Humanities and Performing Arts, Section 1
Location: Lake Superior Room, 10:00 AM-10:15 AM
Mentor(s): Alison Dobbins (Theatre)

Call and response methods in interactive theatre are a means of prompting audience members into participation in the performance. In Theatre Engine, an interactive theatre performance using a mobile device application to prompt audience interaction in a dance production, call and response is used as the first part of a multi-layered performance. During call and response, the audience first gives the dancer a command via the mobile application, and during a period of observation for the audience the dancer interprets these motions as the "response." Periods of rest and times of control are prompted using audio, visual, or in-app cues such as changing sound qualities, moving lights, or messages or images appearing on-screen. The ultimate goal of these methods is to create an environment where audience gains a feeling of control over the performance as well as to guide the audience into knowing when and how they should be participating. The focus of the research presented here is to determine which methods improve audience interaction. Lights on the audience versus lights on the dancer may indicate current control, just as changing music may help establish defined periods of call and response. Through ongoing trials, we are testing these methods and how the changes affect audience level of participation and ability to interact with the dancers.

ORAL PRESENTATIONS, SECTION 2

EAST MEETS WEST: COMPARING EARLY BRITISH PUNK TO CURRENT JAPANESE PUNK
Emma Theis, Chelsey Wright
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room, 11:15 AM-11:30 AM
Mentor(s): Theresa Winge (Art, Art History, and Design)

Subculture members are frequently identified based on their distinct and subversive dress; decoding the visual culture reveals the rich communities and ideologies created within subcultures. Originating in the 1970s, British Punk revolved around punk rock music, ideologies, pop culture (films and literature), and fashion. Several prominent English rock bands fueled the punk subculture and all of it's followers into an anti-authoritarian, rebellious manner; among the bands were the Sex Pistols, Rommones, and The Clash. Punk dress was a culmination of working class clothing with irony, such as combining Doc Martens, safety pins, and plaid. Britain's punk scene was the center of which other countries' punk subcultures pulled inspiration from, most notably Japanese punk. Japanese punks have perfectly visually replicated how punks of western

cultures dress. One Japanese punk subculture in particular draws their dress and style from the early British punk subculture. However, because this Japanese subculture imitates perfectly early British punks, the authenticity of Japanese punk subculture is called into question. The visual similarities between early British punks and some Japanese punks today often causes viewers to conclude the Japanese are merely wearing costumes instead of consuming not just the punk clothing but the punk outlook and identity as well. Our research examines the contrasts and similarities between the early British Punk subculture and contemporary Japanese Punk subcultures. We use images as primary data to discuss punk dress codes in respect to Western subcultures.

THE MILLER AND THE BROOK: DISTINCTIONS BETWEEN MAN AND FEMINIZED NATURE IN SCHUBERT'S SONG CYCLE DIE SCHöNE MüLLERIN (1823)
Jane Sylvester
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room, 11:30 AM-11:45 AM
Mentor(s): Marcie Ray (Music)

This presentation explores the relationship between man and feminized nature in Franz Schubert's song cycle, Die schöne Müllerin. I am studying Die schöne Müllerin to show that Schubert's anthropomorphic characterization of a brook transforms nature into a feminine source of antagonism in German Romanticism. Although no one has yet noticed the brook's feminine qualities, the poet, Wilhelm Müller, deployed a number of feminine signifiers: the brook is "babbling", "entrancing", "captivating", and "flowing" - all terms which have longstanding associations with femininity. The brook's musical motives develop over the course of the cycle, progressively taking on a distinct and gendered identity and through musical conversation with the miller. Eventually, the brook takes on its own lingual voice as a feminine, maternal figure in the last two pieces of the cycle. Furthermore, the brook assumes a number of relationships with the miller: "she" acts as a jovial, light-hearted friend, an entrancing seductress, and eventually, a twisted maternal figure, comforting the protagonist with her lullaby as he drowns in her watery embrace. Through looking at the song cycle and a selection of his lieder, this presentation will show not only that the brook is coded feminine, but that it also speaks to wider cultural concerns about feminine wiles and evil mothers.

HOOKING UP IN THE MODERN, DIGITAL ERA
Emily Dallaire, Brooklyn Pluger
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room, 11:45 AM-12:00 PM
Mentor(s): Stephanie Amada (Writing, Rhetoric & American Cultures)

This research project addresses the various impacts of relationships and hookup culture on social media, discussion, and its relevance to students. As students, we have noticed a spiked interest of academics on the topic of hookup culture and took note of the aspects of hookup culture integrated throughout the university life. Academics and journalists alike have been researching and writing about the behaviors of students with a focus on whether or not this culture is beneficial or detrimental to women. This trend led us to engage in the following inquiry: With so many academics and writers talking about hookup culture, how is this relevant to students? Is there a valuable conversation that can happen with or among students? What kinds of media are the most influential to this hookup culture? Our inquiry led us to purposely arrange our tactics to break out of the traditional academic approach with disengaged statistics and facts and we immersed ourselves within these constructed communities to observe main influences. We were able to tailor to popular topics around the lives of young adults and utilize social media in an effective way to create a place where students can discuss these topics through a safe but informative community. By examining these multiple forms of communication throughout the project, we will discuss what we have learned and how our research can come full circle to have a meaningful impact on our students dealing with this hookup culture.

APPLYING UNIVERSAL DESIGN TO THE CREATIVE PROCESS OF DEVISED THEATRE
Megan Cochrane
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room, 12:00 PM-12:15 PM
Mentor(s): Deric McNish (Theatre)

Universal Design began as a set of architectural principles that then blossomed into the field of education, calling for flexible, accessible, and customizable approaches to teaching and learning. This research project aims to connect Universal Design for Learning (UDL) to the creative process, specifically the process of devising, to create what we call Universal Design for the Creative Process (UDCP). By examining the unique ways in which Michigan State University's Department of Theatre newcomers devised their debut show Freshman Showcase: Off With Her Head, we discovered how the process of devising could benefit from regular implementation of UDL principles. These unique UDL principles implemented by the cast of Off With Her Head include photographic "journaling," online forums, Facebook posts, video sharing, and regular online collaboration and discussion. This presentation explores the Off With Her Head devising process as a whole and how the company's show benefitted from using additional UDL-inspired tools in their process. Furthermore, this presentation explains

the need for UDCP in theatre programs to more readily include individuals of all types and abilities and allow them the opportunity to experience the joy that is theatre.

ON THE LOGIC OF INFINITY
William Penn
Category: Humanities and Performing Arts, Section 2
Location: Lake Erie Room, 12:15 PM-12:30 PM
Mentor(s): Matthew McKeon (Philosophy)

In resolving a paradox, specifically the paradoxes of the infinite (Zeno's paradoxes, the set theoretic paradoxes, etc.), there are three options available. Given a typical argument with premises P, inferences F, and conclusion C, if C is paradoxical, then one can either reject P (or one member of P), reject F (or one member of F), or accept C. I claim that in responding to a paradox of the infinite, the third solution is preferable because it comes with far less conceptual and utilitarian cost than the other two. I shall argue that the proponent of logic revision retains the power of metaphysics at the cost of deductive power, and the proponent of ontological revision sacrifices the power of metaphysics to preserve logic, while the third option retains the full power of metaphysical intuition and logic at a much lower cost: the revision that certain logical principles (specifically the law-of-excluded-middle) are quasi-valid, not valid simpliciter. I shall focus my discussion to the specific case of the set theoretic paradoxes (generated by the axiom of unrestricted comprehension) and I shall argue that, since these typify paradoxes of the infinite, my solution can be properly generalized to include other paradoxes of infinity.

POSTER PRESENTATIONS, SECTION 1

RESULTS OF A SURVEY OF STUDENT ASSUMPTIONS ABOUT PROFESSIONAL WRITING
Jessica Link
Category: Humanities and Performing Arts, Section 1
Poster: 280
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Stuart Blythe (Writing, Rhetoric & American Cultures)

Professional writing is not as well known as other humanities majors, such as English and philosophy. Because of that, I believe students come to the major with a much less defined idea of what it is. This survey is designed to see whether student assumptions about the professional writing major change over time. How do assumptions about professional writing compare between seniors, juniors, sophomores, and freshman? In this poster session, I will report on the results of a survey of all professional writing majors.

THE RISE OF THE FEMALE ARTISAN FREELANCER
Alyssa Onder
Category: Humanities and Performing Arts, Section 1
Poster: 281
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Kate Fedewa (Writing, Rhetoric & American Cultures), Kathryn Houghton (Writing, Rhetoric & American Cultures)

This study investigates the current freelance practices in the U.S., specifically the ways in which women have changed in the industry. Freelancers are becoming an essential asset to the U.S. economy, and a large majority of those freelancers are women. However, many women in freelance are not being recognized as business-owners because their unconventional work practices are often mistaken for common domestic hobbies. With the rise of digitally based, artisan freelance careers, women are being given the opportunity to be regarded as more than just hobbyists. This study examines how women in artisan freelance fields use their personal interests to create reputable and successful self-employed businesses. Research will be done on the trends and development of the U.S. freelance industry. Special attention will be placed on women and the emergence of digital and artistic freelance outlets, such as Etsy, Society6, Tiny Showcase, and 20x200. This study will examine the spike in the amount of female artisan freelancers over the past decade and the reasons why the industry has become female-dominated. This study is important in the recognition of women as self-starting, self-motivated, entrepreneurs. If they are considered by themselves and consumers to be entrepreneurs, it will increase their credibility and describe a more accurate representation of freelancers in the U.S. economy.

AMERICAN MUSLIMS ENTERING HOLLYWOOD
Kanza Khan
Category: Humanities and Performing Arts, Section 1
Poster: 282
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Simei Qing (James Madison College)

American Muslims entering Hollywood as editors, screenwriters, producers, directors, actors, and other roles with the American entertainment industry. This research takes a look at the struggles and accomplishments of the American Muslim community who are part of Hollywood. The interviews and their biographies shed a light on their ambitions on the narrative they want to portray through Hollywood and the obstacles they encounter because of their Muslim background. Do American Muslims really belong in the Hollywood industry? The research looks also at shows, movies, studios, and other aspects of the industry that encourage and discourage the Muslim community from feeling really American.

PROFESSIONAL DEVELOPMENT IN THE ARTS & HUMANITIES
Shannon Gillespie
Category: Humanities and Performing Arts, Section 1
Poster: 283
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Scott Schopieray (Academic Technology- Arts and Letters)

This research seeks to understand and improve the professional development of the arts and humanities students. Through a compilation of interview and survey derived data, it examines what steps students are taking as they prepare for and enter the work force. The controlling focus of the project has been how students develop professionally through the use of several resources, including career and university resources, networking, and job searching. Thus far, there have been several results that demonstrate the underutilization of career resources in the college and university. Other results show how being active and involved in university activities, like the Creativity Exploratory, provide professional development experiences, networking opportunities and career guidance from advisors and mentors. This further research will provide more knowledge about how arts & humanities students prepare themselves professionally, and also to find ways to get more students to utilize the university and college resources.

THE MOUNTAIN OF THE SKY'S PERFUME: MAPPING THE LINK BETWEEN POETIC EPITHETS AND FAMOUS PLACES IN THE OGURA HYAKUNIN ISSHU
Rebecca Avila
Category: Humanities and Performing Arts, Section 1
Poster: 284
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Catherine Ryu (Linguistics and Languages)

The Hyakunin Isshu (literally, one hundred poets one hundred verses)is a celebrated collection of classical Japanese poems, compiled in the thirteenth century, by Fujiwara Teika. My research aims to delineate an important cultural dimension of this collection by analyzing a poetic device known as makura kotoba (literally, pillow word), which functions as a fixed epithet modifying a noun. Specifically, I will investigate the relationship between makura kotoba and famous places mentioned in the collection to illuminate how the link between the two amplifies the overall tone and meaning of the poem in question. Moreover, I will represent this link by mapping them on to a cartography of contemporary Japan. In so doing, I highlight the geographical origins of the poetic coupling of makura kotoba and famous places that have become increasingly opaque and tenuous to modern readers. In other words, by bringing together the geographical mapping and the poetic imagining as captured in The Ogura Hyakunin Isshu, I ultimately hope to create a hands-on approach in visual terms to help novice readers of this collection gain elemental knowledge indispensable to navigating through the enduring cultural significance of the poems that heavily rely on the link between makura kotoba and famous places.

ENCOURAGING AUDIENCE PARTICIPATION THROUGH IMAGERY
Alexandria Fowler
Category: Humanities and Performing Arts, Section 1
Poster: 285
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Alison Dobbins (Theatre)

The ultimate goal of this project is to have an audience fully engaged and interacting with dancers in a performance space. This will be done through a set of activities that gradually get the participants more involved through the use of their smartphones. The performance starts with select audience members controlling the dancers' movements through gestures made on the smartphone. After a connection is established, the dancer will invite this audience member into the performance space. At this time a set of predetermined poses will appear on the smartphone that the audience will move through at increasing tempos until they, themselves, are dancing amongst the performers. The focus of the research presented here is to determine the most effective graphics to illustrate poses for this performance, while still allowing for interpretation and putting emphasis on the movement rather than the final pose. It would be ideal if the audience were free to interpret these poses and make them their own to maximize their enjoyment of this experience. Realistic images limit interpretation of the pose, while abstract images may not give enough structure and clarity. Various images will be used in rehearsals with dancers and participants to see which ones convey the desired results. The participants' input will be crucial to evaluate

which images gave them the opportunity to make the poses original. The optimal graphic will then be chosen to illustrate these poses and incorporated into the smart phone application as one of the components of the Theatre Engine project.

POSTER PRESENTATIONS, SECTION 2

STARVING THE ARTS: STARVING FOR THE ARTS
Sarah Fagerman
Category: Humanities and Performing Arts, Section 2
Poster: 288
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Danielle DeVoss (Professional Writing)

Numerous studies have provided evidence that engagement in the arts has specific educational benefits that transfer to subjects outside of the arts. Some of these benefits include critical thinking, nonverbal reasoning, and conflict resolution skills, and links to proficiency in reading, science, and mathematics. With dwindling education funds around the state and nation, vital arts programming is usually the first thing to be sacrificed and slashed from school budgets. Such is the case in the Lansing Public School District, which, facing a staggering budget deficit, decided to terminate traditional art, music, and physical education classes from its elementary schools. The objective of this research is to understand the effects of these programming cuts as they relate to the local arts community, teachers, and students, and community at large. Additionally, my research will investigate the possibility for and impact of arts integration in the classroom by non-arts teachers. The poster presentation will present findings from interviews with leaders in the arts community, teachers, and contracted consultants in order to understand what new relationships, models, and pedagogies of art education are emerging from this situation. Research on this subject is important because the study of the arts is a fundamental aspect of a critical education. As these cuts occur disproportionately in urban districts, we face a deficit in educational equality in providing the skills necessary for educational success as well as success in the world outside of the classroom.

AFFECTIVE RESPONSES TO LITERATURE: THE INFLUENCE OF SYNTAX ON AFFECT IN JANE AUSTEN'S MANSFIELD PARK
Andrea Zuchora, Amy Hilliker
Category: Humanities and Performing Arts, Section 2
Poster: 289
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Natalie Phillips (English)

With the advent of text-based communication, the perceived tone and inflection of the written word has become an increasingly interesting and relevant topic. One of the key factors in decoding the reception and meaning of a text is the emotional valence, or affect, of the words used, especially in conjunction with the overall syntax. In an effort to analyze how emotionally coded words can influence an individual's reading experience, our study draws from an interdisciplinary Stanford University experiment in which 18 PhD students read a chapter of Jane Austen's Mansfield Park while in an fMRI scanner. Afterward, the participants then wrote a brief essay on specifically marked passages. We investigated both the narrative of the chapter itself, as well as the participants' post fMRI essays in order to correlate trends between reading time, essay themes, and quoted passages from the original text. Using innovative digital humanities techniques to unravel how sentence style and structure contribute to the perceived affect of a passage, we hope to decipher how literary style contributes to an understanding of text. In particular, Austen's penchant for negation, irony, and inverted syntax resonated with the participants, which could suggest that the perceived affect of a passage influences reading attention and comprehension. This has exciting implications for discerning how language influences personal experience, as well as the effect that literature exerts over emotional states, reaffirming the importance of the humanities and arts in education.

DYNAMIC SET DESIGN: INTERACTIVITY IN PERFORMANCE
Ian Hyslop
Category: Humanities and Performing Arts, Section 2
Poster: 290
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Alison Dobbins (Theatre)

As a general rule, audiences are a step removed from the performance, typically viewed as passive observers. Performance can be much more visceral for the audience when they are actually part of it. This research project is focused on a facet of an interactive dance performance that will be presented by Theatre Engine this spring. In this performance, the audience is invited up on stage to interact with the environment and the dancers, becoming a part of the dance. The audience uses mobile phones to impact aspects of the show, in an attempt to make them feel connected to the dancers and create a unique experience. The focus of the research for this presentation is on methods for the audience members to remotely trigger changes in the stage space via their mobile phone. For example, an audience member could move their phone and engage a fan that blows fabric hanging across the environment, making rippling shadows. A path could be lit up near a participant's chair, and they could follow it towards an interesting element in the space they could interact with using their mobile device. These methods ease the audience members into the environment and eventually encourage them to explore and join in the

dance. The performance has several distinct stages that build the tempo and level of participation to engage audience members and create a unique performance experience. This experiment blends technology with performance to push the boundaries of theatre.

ARTISTIC INTERPRETATION OF THE AGE OF WONDER
Abigail Tomlinson
Category: Humanities and Performing Arts, Section 2
Poster: 291
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Jim Smith (Biology)

During the Age of Wonder – the period of expansive scientific development occurring in the 16th and 17th centuries Europe – visual arts were a key means of relaying information and discoveries to the public. Sketches of specimens and geography were integral to the journal entries of natural philosophers, such as Charles Darwin, William Herschel, and Joseph Banks. Novelists, like Mary Shelley and Lord Byron, used those scientific developments as muses for their written works. Material from a study abroad in the United Kingdom was used to generate a mixed media portfolio relating to the scientific developments of the Age of Wonder. Various art styles viewed in the National Gallery as well as experiments conducted and discoveries made by the great philosophers of the time were used as inspiration for the artworks. The different pieces all interpret a theme of evolution – of the mind and body, and nature itself.

CAPTURING THE EPHEMERAL: USING DIGITAL TOOLS TO RECORD SITES OF PARTICIPATORY MEMORY
Christine Scales
Category: Humanities and Performing Arts, Section 2
Poster: 292
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Liza Potts (Writing, Rhetoric, and American Cultures)

Due to their ever-changing nature, sites of public memory are difficult to capture. My research focuses on methods for successfully recording the changes in these spaces using various digital platforms. As a pilot study, I spent two weeks photographing and taking daily notes on the changes made to The Rock, an MSU landmark and unofficial community "message board." I then experimented with uploading the information I collected to various digital spaces. By exploring and testing these tools, I hope to discover the pros and cons of using each platform, and to find which space offers the best way to discuss and record a site. The findings of this research will be used in a study abroad program this summer which focuses on visiting and documenting sites of participatory memory, and it will offer insight on how best to capture and discuss spaces that undergo frequent change.

A STUDY OF HUMAN COMPUTER INTERACTION IN MOBILE DEVICES AND ITS IMPLICATION ON THEATRE PERFORMANCE
Scott Binter
Category: Humanities and Performing Arts, Section 2
Poster: 293
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Alison Dobbins (Theatre)

This research focuses on the development of mobile devices in digital theatre performance. This particular work of art is intended to bring the audience to their feet and integrate them as part of the performance. The audiences' attention on the mobile devices will distract from the tension and stress of performance. The focal point of this portion of Theatre Engine is to establish a connection between the audience and the performers with mobile devices. Audiences need to be given some measure of control over the performance utilizing large movements recorded by mobile accelerometers, while leaving interpretation and the insurance of a quality production up to the performers. As a motion is made, sound is sent to an associated dancer for interpretation. This motion to auditory transmission is vital to the performance as other forms of communication were shown to yield less creativity on behalf of both participants and performers.

THE EFFECTS OF AN ONLINE PRESENCE ON A PRINT PUBLICATION
Eric Walters, Eliza Foster
Category: Humanities and Performing Arts, Section 2
Poster: 294
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Laura Julier (Professional Writing)

Fourth Genre is a literary journal published by the Michigan State University Press that focuses on creative nonfiction. In recent years, under the guidance of editor Laura Julier, the journal has expanded its presence beyond the printed page, creating ways to interact with its audience on the web. The journal now has a consistent online presence through numerous venues. The staff crafted a social media strategy that guides its posts to Facebook and Twitter, allowing the staff to engage

directly with readers. The editorial staff also redesigned and launched a website separate from the MSU Press site, allowing new content created specifically for the web to be created under the FG name. One of those projects was a podcast series that serves as a platform for the journal to have in depth conversations with authors and editors about the world of creative nonfiction. What the editorial staff set out to find is how much effect its online presence is having. Does having an online presence actually benefit a print publication? To learn whether or not an effect was taking place, we looked at a time in which little content was posted for the journal online and compared it to a time in which Fourth Genre's online activity was high. The results will help guide the Fourth Genre staff in future online and non-print endeavors, as well as shed light on how important social media and multimedia content really are.

LINGUISTICS, LANGUAGES, & SPEECH

ORAL PRESENTATIONS, SECTION 1

LES LIAISONS MYSTERIEUSES: ESTABLISHING A TIMELINE FOR LIAISON ACQUISITION
Kevin Westfield
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 1:00 PM-1:15 PM
Mentor(s): Anne Violin-Wigent (Romance and Classical Studies)

For students just beginning to learn French, few things must be more frustrating than letters that sometimes are pronounced and sometimes not. This phenomenon, called liaison, is a type of linking in which a silent word-final consonant becomes pronounced when it precedes a vowel in certain contexts dictated by style, morphology, semantics, and syntax. The liaison is often divided into three categories: obligatory, or contexts which almost always induce liaison; forbidden, contexts that prevent liaison; and optional, contexts in which style often dictates whether a speaker will perform a liaison. For instance, an article followed by a noun, the context that will be studied in this presentation, is considered an obligatory context. After having studied the liaison's mental representation for non-native French speakers, this presentation will attempt to establish a timeline of liaison acquisition among American students learning French. Participants in the study are current MSU students in 100-, 200-, and 300-level French courses. They will be asked to perform two tasks: the first is a description task involving a picture designed to elicit many article+noun pairs, the second is a reading test designed to test the limits of participants' liaison acquisition. These two tasks will allow me to construct a timeline of liaison acquisition among anglophones learning French so teachers can give the most meaningful and timely instruction for the acquisition of the liaison in this context.

NEUROLOGY AND NARRATOLOGY:EXAMINING THE LINK BETWEEN NEUROLOGICAL ACTIVITY AND ABSTRACT/CONCRETE NARRATIVE PROMPTS
Connor Swanson
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 1:15 PM-1:30 PM
Mentor(s): Natalie Phillips (English)

Work has been done recently in examining the links between linguistic prompts and neurological activity; little has been done, however, to extend these important findings to narrative studies. This study adapts Brysbaert's scale, rating concreteness for 40,000 English words in an extra-literary context, by adjusting it based on context clues within the narrative of Jane Austen's Mansfield Park. Our adaptations of this scale will provide one model for evaluating readers' responses to words that evoke concrete stimuli within a text's grammatical nuances, a task that previous studies of concrete and abstract language have constrained to individual words. Future implications for this research, in conjunction with eye-tracking data collected from subjects' fMRI scans, possibly includes correlating the reading of abstract and concrete words, phrases, and clauses with activation in the motor or somatosensory cortex.

THE LOSS OF BARE SINGULAR NOUN PHRASES IN THE HISTORY OF ENGLISH
Kenneth Hanson
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 1:30 PM-1:45 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

Languages vary in the degree to which noun phrases can appear without overt determiners. The distribution of bare singular noun phrases (BSNPs), in particular, is complex crosslinguistically, and varies within a language by syntactic position as well as semantic properties of the head noun. English, for example, formerly allowed BSNPs in a variety of positions, while today they are only possible in unique role predicates (Obama is president vs. * Obama is lawyer). In this study we examine the loss of BSNPs between Middle English and Early Modern English using the Penn Parsed Corpus of Middle English 2nd Edition (PPCME2) and the Penn Parsed Corpus of Early Modern English (PPCEME). In order to do this, we created a representative list of singular count nouns of several semantic classes and used the CorpusSearch program to code each occurrence for bareness and syntactic position as well as the date of the text it appears in. Using the coded data, we ran a series of logistic

regressions using R. Our results show a universal decline in BSNPs throughout the period of investigation, with three clusters of curves: (1) arguments and non-role predicates at the bottom, (2) non-unique role predicates in the middle, and (3) unique role predicates at the top (since they survive into modern English). These results confirm the patterns predicted by Munn and Schmitt (2005), which derive the distribution of BSNPs from the availability of a zero-determiner and differences in grammatical number marking between different semantic noun classes and syntactic positions.

A QUANTITATIVE ANALYSIS OF THE SYNTAX OF CLASSICAL JAPANESE POETRY
Kenneth Hanson
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 1:45 PM-2:00 PM
Mentor(s): Catherine Ryu (Linguistics and Languages)

Many forms of poetry have an intrinsically quantitative element to them: meter. The constraint of meter forces the author to use various techniques to fit the content of the poem to the form, including the choice of syntactic structures. This study examines these choices in the tanka, the traditional Japanese short poem, which consists of five units with a (relatively) consistent 5-7-5-7-7 mora pattern (a mora is a kind of short syllable composing the basic time unit in Japanese). This restrictive form makes an excellent object of study since we can quantify the distribution of different syntactic categories by line and syllable. This study utilizes computer software to parse a text, produce visualizations of the data uncovering patterns that might otherwise be difficult to detect, and use statistics to draw conclusions about these patterns. For the text, I selected Ogura Hyakunin Isshu, a Japanese poetry anthology from the Heian Period (c. 800-1200 CE) consisting of one hundred tanka. I parsed the text using the morphological analyzer Mecab and UniDic for Early Middle Japanese, creating a spreadsheet containing part-of-speech tags and Kana (phonetic character) readings for each morpheme in the text. Next, I used a custom-written Python script to add the line number and start/end syllable indices of each morpheme. Finally, I used R statistical programming language to test for correlations between line/syllable position and various syntactic structures. Through this work, I hope to demonstrate the usefulness of methods of corpus linguistics to the understanding of the humanities.

FUNCTIONAL REGIONS ACTIVATED BY LITERARY READING: AN FMRI STUDY
Craig Pearson, Inez Garzaniti, Kirsten Mayfield
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 2:00 PM-2:15 PM
Mentor(s): Natalie Phillips (English)

The emerging field of “literary neuroscience” utilizes interdisciplinary approaches to explore how the human brain functions during reading. In order to investigate differences between attentive “close reading” of literature -- a key skill taught in humanities education -- and natural pleasure reading, several PhD candidates in literature (n=18) were asked to read passages from Jane Austen’s Mansfield Park while in an fMRI scanner. BOLD data was obtained in both the close reading and pleasure reading conditions, and FSL was used to analyze differential activation across the brain throughout the scan. Activation was mapped to 3D anatomical images acquired from each subject, and a group analysis averaged activation from all 18 subjects onto a standard Talairach brain. Clusters of significant differential blood flow were matched with their corresponding functional Brodmann Areas using an individualized approach in which anatomical landmarks were identified on each individual brain, as well as a standardized approach wherein a Talairach coordinate database estimated the Brodmann Areas nearest to each cluster. The group analysis showed significant increases in frontal lobe activity during pleasure reading, and more diffuse right hemisphere activity during close reading. Individual subjects varied widely in their patterns of neural activity, suggesting that individual reading experiences vary widely among a diverse set of brain regions, although a small set of functional regions appear to be heightened in both close and pleasure reading. Future work will seek to correlate patterns of neural activity with eye tracking data and post-scan literary essays written by each subject.

A UNIFIED ANALYSIS OF PASSIVE CONSTRUCTIONS IN ENGLISH
Adam Liter
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 2:15 PM-2:30 PM
Mentor(s): Cristina Schmitt (Linguistics and Languages)

One task of linguistic inquiry is to figure out what structures underlie sentences, something which is not always clear based just on the overtly pronounced words of a sentence. For example, sentences like "John wants to win" have an underlying syntactic structure with an unpronounced pronominal element called PRO: [John wants [PRO to win]]. In sentences like these, PRO is controlled by "John", as it depends on "John" for its interpretation (i.e., the sentence means John wants John to win). Similarly, Collins (2005) has argued for the presence of unpronounced elements in passive sentences like "the ball was kicked". He argues that the syntactic position normally occupied by the Agent of the kicking event in an active sentence ("John" in "John kicked the ball") is covertly present in the structure of the passive ("the ball was kicked") but remains unpronounced. I provide arguments that this is also true for the get-passive ("the ball got kicked"), and I show how Brownlow’s (2011) analysis of the word 'get' can be adapted to incorporate Collins’s analysis of the be-passive. One

consequence of my analysis is that one can account for the interpretation of PRO in sentences like "the ball got kicked PRO to get it off the field". Recall that PRO must be controlled by another element for its interpretation. If the Agent of the kicking event is covertly present in the syntactic representation of "the ball got kicked", then we have en explanation of what controls PRO and gives it its interpretation.

THE COGNITIVE OPERATIONS THAT UNDERLIE HUMAN LANGUAGE: A VIEW FROM APPOSITIVES
Adam Liter
Category: Linguistics, Languages, and Speech, Section 1
Location: Lake Michigan Room, 2:30 PM-2:45 PM
Mentor(s): Marcin Morzycki (Linguistics and Languages)

Two key assumptions of linguistic theory are that language is instantiated in the brain and that whatever underlies the human capacity for language is some sort of generative mechanism, allowing the production of infinite sentences from finite means. One task of linguistic theorizing is thus to figure out what cognitive operations plausibly constitute this generative mechanism. Any generative mechanism at least needs the ability to combine atomic elements (e.g., words). Chomsky (1998, 2004, 2007) thinks the operation Merge (which takes two atomic elements, α, β, and combines them to form a new unit) is the primitive cognitive operation that equips the human generative mechanism with this combinatorial ability. A competing proposal is Hornstein's (2009). He holds that Merge is not primitive but is the composition of two cognitive operations, Concatenate (which puts two atomic units, α, β, together) and Label (which labels the output of Concatenate as one of the inputs, rendering it atomic so that it can undergo further concatenation). I argue that a theory with Hornstein's theoretical assumptions predicts the existence and characteristics of appositives, which are parenthetical parts of sentences like "who was hiding" in "John didn't see Bill, who was hiding" (cf., Potts 2003). One property of appositives that is predicted on Hornstein's account is that they can never be bound by negation. The previous example, for instance, can never mean that Bill was not hiding. I show how this and other properties fall out from Hornstein's account, suggesting that his account might be preferable.

POSTER PRESENTATIONS, SECTION 1

TAKING BATHS WITH DUCK-DUCKS: EXPLORING CHILDREN'S UNDERSTANDING OF CONTRASTIVE REDUPLICATION
Kyle Latack, Mina Hirzel
Category: Linguistics, Languages, and Speech, Section 1
Poster: 295
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

There is often ambiguity in the sentences we produce, and the less likely an interpretation is in a conversation, the more likely we are to use special grammatical devices to clarify. One such device is called Contrastive Reduplication (CR). In the sentence; "He plays with a duck in the bathtub", the duck can be either real or fake. To resolve this ambiguity we can use CR and say; "It's a duck-duck", which denotes a real duck. Understanding CR requires certain pragmatic knowledge. There is a well known asymmetry between children's development of syntax and semantics compared to their development of pragmatic knowledge. It follows then that CR should be difficult for children to understand. We present two experiments exploring children's comprehension of CR. For the first experiment, children heard sentences in ambiguous contexts involving animals. Later, they would hear the same sentences, but this time with CR. Children had a fake interpretation in the ambiguous sentences and then switched to a real interpretation in the CR sentences 41% of the time. However, they were just at chance for being correct with the CR sentences. For the second experiment, children will be asked to arrange tiles with pictures on them in a predetermined order. The set of tiles will have real and fake pairs of the same animal. CR will be used for clarification, and if children understand CR, then they should produce the correct order. These experiments explore children's comprehension of CR which would demonstrate pragmatic knowledge.

THE VARIATION OF SUBJECTS IN DOMINICAN SPANISH
Kyande Sanders
Category: Linguistics, Languages, and Speech, Section 1
Poster: 296
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Gabriela Alfaraz (Romance Languages and Classical Studies)

Reference is among the linguistic factors that have been found to influence the expression of null and overt subjects in Spanish (Ávila-Jimenez, 1995, Bayley & Pease-Alvarez, 1997; Bentivoglio, 1987; Cameron, 1993, 1995; Holmquist, 2012; Otheguy & Zentella, 2012; Silva-Corvalán, 1982, 1994; Travis & Torres Cacoullos, 2012). In this project, I study the variation of subjects in Dominican Spanish to examine whether their cognitive status and ease of recoverability in discourse can account for their variation. The sample contains seven women, residents of Santo Domingo, Dominican Republic, in three age groups, ranging from 17 to 67 years of age. The coding of subjects followed the Coding Protocol for Statuses on the Givenness

Hierarchy (Gundel, 2006):in focus > activated > familiar > uniquely identifiable > referential > type identifiable. Along with Givenness, I analyze other linguistic factors, including switch reference, person and
number, as well as social factors, such as age. A multivariate analysis will be run on the factors to obtain results. I expect that Givenness will have a strong influence on the variation.

AN ARTIFICIAL LANGUAGE INVESTIGATION OF NUMBER AND NUMBER NEUTRALITY
Emily Glaser, Tess Huelskamp
Category: Linguistics, Languages, and Speech, Section 1
Poster: 297
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

When learning language, one aspect people must learn is how their language encodes number. In American English (AmE) and Brazilian Portuguese (BrP), a noun must be singular or plural ("dog" or "dogs"). The languages differ because BrP can allow "dog" to mean either 1/1+ dogs. In languages like Korean, nouns lack number marking ("dog" could refer to any number of dogs), but optional markers can specify number. Speakers must learn what meanings number markers have because their meanings differ cross-linguistically. To AmE and BrP speakers, "There are no dogs in the house" is true only if there are 0 dogs in the house. For Korean speakers, it is true if there are 1 or 0 dogs in the house. Previously, we showed that AmE and BrP speakers adopt the Korean meaning of plural after being exposed to an artificial language modeled after Korean. We hypothesize this is so because requiring number marking or not in a language constrains the possible meanings those markers can have. In this experiment, we vary the frequency of singular, plural, and bare noun phrases (NPs) to model BrP (which exhibits fewer bare NPs than Korean) to see if input frequency affects how AmE speakers interpret number in the artificial language. If our hypothesis is correct, participants who learn bare NPs as part of the language's grammar will assign a Korean-like meaning to the plural marker, while speakers who do not (perhaps due to low frequency) will assign the AmE/BrP meaning to the plural marker.

THE DEVELOPMENT OF STORY GRAMMAR OVER TIME AS IT RELATES TO SOCIOECONOMIC STATUS
Alexandra Barman, Haley Farkas
Category: Linguistics, Languages, and Speech, Section 1
Poster: 298
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Lori Skibbe (Human Development and Family Studies)

Story grammar represents the language that children use to display the connections between parts of the story. We focused on three aspects of story grammar that children utilize: storytelling elaborations, story framing, and plot. We will examine how these concepts develop over time as well as whether aspects of story grammar relate to children's socioeconomic status. Our sample includes 160 children (68 girls; 92 boys) ranging from 3-6 years of age at the start of the study (Mean age = 52.66 months; SD = 7.51). Across the two time points, separated by six months, the children retell stories from a wordless storybook. We coded storytelling elaborations, story framing, and plot. Storytelling elaborations include usage of elongations, character references, similes and gratuitous terms. Story framing includes use of titles, conventional openings, and conventional ending. Plot refers to children's discussion of sub-goals, sub-problems, sub-solutions, and sub-resolutions in the story. We measure socioeconomic status as self reported by caregivers in a survey given before time point one. We plan to utilize a regression analysis predicting elements of story grammar at the second time point from children's story grammar at the first time and children's socioeconomic status. All children are hypothesized to display greater levels of story grammar as they mature. We also expect that children's socioeconomic status will predict story grammar development. We expect that children who are living in low SES environments are more likely to exhibit less story grammar growth over time.

QUOTATIVES AND AGE-GRADING IN PHILADELPHIA
Alyssa Webster, Heidi Little, Kathryn Verplanck
Category: Linguistics, Languages, and Speech, Section 1
Poster: 299
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Suzanne Wagner (Linguistics & Germanic, Slavic, Asian and African Languages)

Verbs of quotation (e.g. 'be like', 'tell', 'say', etc.), or "quotatives", are a common feature of English as they precede directly quoted speech, thoughts, etc. Some examples are: "I'M LIKE, 'Ah, Jesus!'" (Amanda 2005), "And he SAID, 'Yeah.'" (Lynne 2005). This study analyzes speech collected in Philadelphia from the same panel of six female speakers in 2005 and 2012 to investigate the proportional usage of quotatives across the lifespan. This type of sociolinguistic study, in which data is collected from the same speakers across time, is rare. Within the data, we focused on 'be like' as it is the newest quotative form. Our hypothesis was that 'be like' would represent a smaller proportion of the speakers' overall quotative use in 2012 due to "age-grading". In age-grading, a linguistic feature is used at a greater frequency by younger age groups who reduce their usage of the feature with increased age. Although speakers used quotative 'be like' most frequently, the proportion of 'be like' versus other quotatives did not change with time. This suggests that 'be like' is not age-graded but is stable from

adolescence into adulthood. However, new uses of 'be like' were found within the data such as, "She WAS LIKE, 'You know I'd prefer if you were around,' she SAID." (Amanda 2012), in which quotatives surround the quote. Our results indicate that 'be like' has stabilized as a quotative form in Philadelphia and is now being used in a wider variety of contexts.

THE SYNTAX OF JAPANESE ASPECT
Eric Villanueva
Category: Linguistics, Languages, and Speech, Section 1
Poster: 300
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Alan Munn (Linguistics and Languages), Cristina Schmitt (Linguistics and Languages)

This presentation is on the ordering of time expressions in Japanese, specifically with regards to the interpretation of the progressive and perfect aspect. It is believed that the verbal suffix te-iru does not distinguish between a progressive or perfective interpretation as laid out in Yamagata (2000) and Ogihara (1998). However, as of yet there has not existed a framework to capture these assertions, until now. This presentation applies the framework of describing the relationship of tense, aspect, and time expressions laid out in Demiradache & Extebarria (2010) to the insights from Yamagata (2000). I argue for the use of a referential model similar to that of reflexive pronouns to describe the scope of adverbs over te-iru. I build of the claim that Japanese aspect is a stage level operator. I propose that the verbal gerund te denotes a predicate and focuses a subinterval of an event. My analysis of the syntax of the te-iru is able to make predictions on the interpretations of Japanese aspect with and without modifying time arguments. This is to reinforce the claim that teiru can be sententially ambiguous but unambiguous in discourse. In order to abide by the principles of temporal economy, the model states that prefered interpretations of aspect in Japanese are ones which the features of time of situation matches the features of assertion time.

ACCOUNTING FOR COMPREHENSION ASYMMETRIES IN CHILDREN'S ACQUISITION OF THE PASSIVE
Kevin Kain, Adam Greene
Category: Linguistics, Languages, and Speech, Section 1
Poster: 301
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Alan Munn (Linguistics), Cristina Schmitt (Linguistics)

One problem in linguistics is understanding how children acquire their first language. One aspect of language that is late to be acquired are passive constructions such as "John was chased by the dog". One fact about passive acquisition is that children seem to learn passives of 'actional' verbs (such as 'chase' or 'tear') before they learn passives of psychological verbs such as ('see' and 'hear'). This is called the Maratsos effect (Maratsos et al. 1985). To account for the Maratsos effect, researchers have suggested that preschool children lack the ability to form passives, but can interpret actional passives because they have adjectival forms, while psychological verbs do not, and children have no difficulty in understanding sentences like "John was happy" (Borer & Wexler 1987, 1992; Wexler 2004; Orfitelli 2012). We argue that these hypotheses are misguided as psychological passives are good adjectives. In addition to a theoretical argument against these hypotheses, we present two experiments that test them. First, we test actional passives and psychological passives that make good adjectives. If the adjectival theories are right, there will be no difference in children's ability with these passives. Our hypothesis is that the distinction for children is whether the verb is agentive (has a intentional causer) like 'tear' or not non-agentive (like 'forget'). So, we test actional passives that are agentive and actional passives that are not. If the adjectival hypotheses are correct, there will be no difference, but if ours is correct, there will be a difference.

ANALYZING THE ANATOMY OF STUDENT-RUN ORGANIZATIONS AT MICHIGAN STATE UNIVERSITY
Victor Uhlman, Pamela Stefan
Category: Linguistics, Languages, and Speech, Section 1
Poster: 302
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Catherine Ryu (Linguistics and Language)

This project aims to delineate the anatomy of student-run organizations such as clubs and groups at MSU. We analyze how these organizations, which are a crucial part of collegiate society, are created, run, and remain effective and engaging to students. Our investigation includes, but is not limited to, major demographics calibrated through academic majors, career goals, and common interests, as well as club activities and interactions among members. To that end, in addition to face-face interviews and visits to various club meetings, our project will utilize a set of interactive media with which to survey the target demographic of Asian language learners throughout campus, including those studying Japanese, Korean, and Chinese languages. Through this investigation, we will identify not only the key elements indispensable to the structure of the club itself but also what can be considered the best club practices that lead to sustained enjoyment and longevity of a student-run organization. The outcome of this research will result in enhancing our understanding of the anatomy of a student-run organization that provides an optimal environment for members to grow through their active engagement with the club of

their choice. As such, this research will contribute to generating new forms of knowledge about student life at MSU and disseminating it beyond MSU communities by sharing the data obtained through social media.

COOK AND LEARN: HOW COOKING TASKS CAN FACILITATE SECOND LANGUAGE ACQUISITION
Andrew Najor
Category: Linguistics, Languages, and Speech, Section 1
Poster: 303
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Angelika Kraemer (Center for Language Teaching Advancement)

Food is not only a basic necessity for human survival, it is "culture, habit, craving and identity" (Safran Foer, 2009). It can therefore be a vehicle to learn about culture-specific methods of preparing and eating food, dining etiquette, and ethnic cuisine. World language teachers struggle at times with exposing their students to the target culture in a meaningful, authentic way in traditional classroom settings. Oftentimes, it is a challenge to devise methods that allow students to practice the target language (TL) in a realistic environment. Since it is generally accepted that language should not be taught without culture, this project explores how effectively cooking tasks can be used to expose students to culture and language while reinforcing specific language skill sets. The goal of this qualitative research project is to better understand how following a recipe in another language can reinforce language skills in second language (L2) learners, specifically imperatives, through task-based learning. The study investigates the effectiveness of L2 cooking tasks on vocabulary retention in three groups of students studying different languages at the second-year level. Participants watched a video introducing cooking terminology in the TL and completed a vocabulary test at the beginning and end of the study. A subset of participants attended a cooking event in the TL. A delayed post-test was administered online to all participants. Preliminary results indicate that all participants learned new vocabulary items. Participants who attended the cooking event recalled more vocabulary items with greater accuracy than those who only watched the video.

MICROBIOLOGY, IMMUNOLOGY, & INFECTIOUS DISEASE

ORAL PRESENTATIONS, SECTION 1

VARICELLA AND ITS IMPLICATIONS, A COMPARATIVE STUDY OF THE UNITED STATES AND THE UNITED KINGDOM
Harrison Wermuth, Vos Haley, Michael Wight
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Location: Tower Room, 1:30 PM-1:45 PM
Mentor(s): Mark Largent (Lyman Briggs College)

Through comparison we dissect the differences between the United States and the United Kingdom when it comes to varicella vaccination rates and chicken pox and shingles incidences. Chicken pox, or herpes zoster, is a childhood disease that remains dormant in the central nervous system through adulthood. This means that every time you are exposed you are naturally boosting your immunity. In the United States it is typical to vaccinate children against herpes zoster, but in the United Kingdom this in not enforced. Through comparing these two distinct populations we are able to get a better understanding on the implications surrounding the varicella vaccination. Through incidence rates in each country we found that the chicken pox rates remained consistent throughout the United Kingdom, but the chicken pox rates decreased greatly in the United States after vaccine implementation. Because of the decrease in chicken pox cases in the United States, the elderly population is not getting the natural immunity boost that they have had in the past, which may be correlated with the increase in shingles rates in the United States versus the United Kingdom.

A NEW INFLUENZA VACCINE PRODUCTION SYSTEM
Jenna Carter
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Location: Tower Room, 1:45 PM-2:00 PM
Mentor(s): Paul Coussens (Animal Science), Kelly Sporer (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 virus is best achieved through vaccination. However, vaccine production using the current egg-based method is too slow during a potential pandemic and yields in doses per egg are often low. Also, persons 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 both 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 vaccines and have sequences that are publicly available to help confirm genetic stability. We have successfully infected PBS-12SF cells with avian H5N1 and human

H1N1 viruses and harvested viral supernatants, extracted viral RNA and performed cDNA synthesis. Polymerase chain reaction (PCR) was used to amplify HA and NA gene sequences from the viral cDNA, cloned and finally sequenced by the MSU RTSF. Sequences were analyzed using NCBI BLAST. We are currently optimizing infection parameters for H1N1 virus and increasing the serial passage number up to 10 to ensure high viral stability.

ERADICATING POLIO IN PAKISTAN
Samuel Gregerson, Kevin Kramer, Colin Lesoski
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Location: Tower Room, 2:00 PM-2:15 PM
Mentor(s): Mark Largent (Lyman Briggs College)

Polio has been eradicated in the United States since the 1950's, but still exists in several Middle Eastern and African countries, including Pakistan. Despite a governmental structure much like that of the United States and the United Kingdom, polio has proven to be a difficult problem in Pakistan. We identified several ongoing problems that significantly hinder polio eradication in Pakistan, including cultural issues (gender roles, education/literacy rates, beliefs), political turmoil and instability, religious beliefs, insufficient healthcare management and implementation, international affairs, border control issues and war with bordering India over the Kashmir lands. Polio eradication in Pakistan is not a scientific problem; that is, there is no scientific discovery needed to allow Pakistan to become free of polio. Rather, the eradication of the polio in Pakistan is not a primary priority in the eyes of the Pakistani people. Our group set out to understand Pakistan as a whole in order to identify the issues that have led to this dilemma.

DO YOU REALLY KNOW WHATS IN THE SYRINGE? VACCINES: THE CONTROVERSY EXAMINED
Meg Riley, Megan Ellis, Julia Kerwin
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Location: Tower Room, 2:15 PM-2:30 PM
Mentor(s): Mark Largent (Lyman Briggs College)

We analyzed some of the most common and most controversial preservatives and growth mediums contained in vaccines. Many parents are hesitant to give their children vaccines because they believe these ingredients to be harmful, and popular media tends to encourage these beliefs. Parents are to make informed decisions about their children's vaccination schedule and confront fundamentally irreconcilable sets of claims about vaccines. Our goal behind this project is to offer a perspective on vaccines that looks at why vaccines make people uncomfortable, and provide information that will either validate or refute their concerns. We conducted our research by reading and critically analyzing information from popular media, government websites, and scholarly articles. Our target audience would be the concerned public interested in scrutinizing some of the most publicized risks behind vaccines. Our research will culminate into a paper presentation describing several vaccine ingredients, their specific role in the vaccine, and the controversy surrounding it.

ERMANI DECREASES EXPRESSION OF VIRAL MEMBRANE GLYCOPROTEIN
Matthew Wexler
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Location: Tower Room, 2:30 PM-2:45 PM
Mentor(s): Yong-Hui Zheng (Microbiology and Molecular Genetics)

ERManI is an enzyme that acts in the ER associated degradation (ERAD) pathway. In this experiment, we used transfections and western blotting to show that over-expression of this protein causes a dose-dependent decrease in the expression of membrane glycoproteins from HIV, SIV, HCV, Flu, and EIAV. As these viruses require membrane proteins in order to effectively infect cells, this research holds the potential to lead to anti-viral therapies, and it broadens our understanding of ERManI's activity in cells.

HIGH FAT DIETS CONTAINING EICOSAPENTANOIC ACID OR OLEIC ACID AND INCREASE B-CELL IGA PRODUCTION
Emily Davidson
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Location: Tower Room, 2:45 PM-3:00 PM
Mentor(s): Sarah Comstock (Food Science and Human Nutrition), Jenifer Fenton (Food Science and Human Nutrition)

The typical American diet is high in fat. Although high fat diets are commonly associated with health problems such as heart disease, their effects on B cell-mediated immune responses are unknown. Previous research in the Fenton Lab demonstrated that mice placed on diets containing docosahexaenoic acid (DHA)-enriched fish oil exhibited increased B-cell function and produced higher levels of immunoglobulin (Ig) A. In this experiment, mice were fed one of five diets including: control (Ctrl), high fat (HF), high fat oleic acid (HF-OA), high fat eicosapentaenoic acid (HF-EPA), or high fat DHA (HF-DHA) for a maximum of 10 weeks. The control diet contained 5% fat from soybean oil weight. The HF diets contained 45% milk fat and 5% specified fat. Mouse body weights were recorded, fat mass measured and cecal contents collected after five or ten weeks on experimental diets. No significant differences were observed in body weight or cecal IgA after five weeks. However, after

10 weeks, body weights and fat mass of mice fed HF diets were significantly higher than the control group. Mice placed on diets rich in EPA and DHA were heavier than mice fed a diet rich in OA. Also at 10 weeks, mice fed HF-EPA or HF-OA produced more cecal IgA than mice fed the control diet. Thus, high fat diets led not only to increased fat mass and body weight, but diets high in specific fatty acids also increase B-cell function resulting in increased production of cecal IgA.

POSTER PRESENTATIONS, SECTION 1

THE EFFICACY OF A COPPER BASED WATER DISINFECTANT UNDER BENCH SCALE CONDITIONS OVER A FORTY-EIGHT HOUR TIME INTERVAL
Eric Reilly
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 305
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rebecca Ives (Fisheries and Wildlife), Joan Rose (Fisheries and Wildlife)

This study aimed to determine if 'Product X', a copper based disinfectant, could truly be considered a 'microbial water purifier' according to NSF guidelines, which call for a 6 log10 (99.9999%) reduction of bacteria and a 4 log10 (99.99%) reduction of virus. Sterile water was spiked with R. terrigena, E. coli, and bacteriophage MS2 at concentrations representing typical river conditions. Turbidity, pH, and total organic carbon content of the challenge water were adjusted to meet the conditions of National Sanitization Foundation (NSF) Protocol P231 Microbiological Water Purifiers. The water was split into two carboys, one being exposed to 'Product X' at a 0.59 ppm copper concentration. Samples were taken from each carboy at specific time intervals between 0 and 48 hours. Bacteriophage assays (USEPA Method 1602) and Colilert™ assays (APHA standard method 9223C) were performed for each time point to determine log reductions of bacteria and virus. During the 48 hour study period, log10 reduction for total coliform concentrations ranged between 0.513 and 0.937. Log10 reduction of E.coli ranged between 0.287 and 0.351. Log10 reduction of MS2 ranged between 0.187 and 0.056. Log10 reduction values were not significant when assessed by either time interval ($p > 0.05$, $\alpha = 0.05$) or copper concentration ($p > 0.05$, $\alpha = 0.05$). Maximum log10 reduction values were less than 6 log10 (99.9999%) reduction for bacteria and 4 log10 (99.99%) for virus. The copper based disinfectant does not meet NSF guidelines for a microbial water purifier.

EXPLORING THE RELATIONSHIP BETWEEN THE DIET AND BUTYRATE-PRODUCING COMMUNITY STRUCTURE INSIDE THE ANIMAL GUT MICROBIOME
Mike Rizzo
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 306
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Marius Vital (Center of Microbial Ecology)

Butyrate-producing bacteria play an important role in maintaining host colonic health. They are well studied in humans and certain model animals but less is known for other vertebrates. The objective of this study was to understand and explore the butyrate-producing bacterial community in hindgut fermenting Vertebrata that belong to the Mammalia, Aves, and Reptilia classes. A gene-targeted pyro-sequencing approach of the terminal enzymes of the main butyrate-production pathway, namely butyryl-CoA:acetate CoA transferase (but) and butyrate kinase (buk), was used to locate the butyrate-producing bacteria in the vertebrates. Clear diet-specific patterns were identified, with but genes highly enriched in omnivores and herbivores in comparison to carnivores, while buk genes were prominent in carnivorous animals. 16S rRNA gene analysis showed similar patterns, but this approach is unable to reach the same depth as the functional gene-targeted approach. This study demonstrates that there is a strong correlation between the diet and butyrate-producing bacterial community in hindgut fermenting Vertebrata.

EFFECT OF DECREASING ENRICHMENT TIME FOR ANSR ASSAY FOR SALMONELLA DETECTION
Madeline Lipp
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 307
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Joan Rose (Fisheries and Wildlife)

EPA Method 1682 is the culture-based method currently used to detect Salmonella in water. This method is time consuming due to its multiple stages of incubation, and is non-specific for pathogenic species. Use of a Nicking Enzyme Amplification Reaction (NEAR)1 would provide a more efficient process for determining presence and concentration of Salmonella. The current protocol for ANSR™ (Neogen, Lansing, MI) requires a 24 hour incubation before amplification. It is possible that this incubation time could be shortened while maintaining equivalent recovery. To test this, reagent water samples were spiked with a known concentration of Salmonella typhimurium. Spiked samples were assayed seven times over a 24 hour period using ANSR™. Results indicate that detection of Salmonella peaked after 8 hours of incubation and matched results from the 24 hour incubation from this point forward. Recovery remained constant at 82% for hours 8-24. This data indicates that

incubation time for the ANSR™ assay could be decreased by 16 hours, improving the efficiency of the assay. Future assays should be performed as the same timed series from environmental samples in order to provide more evidence for this finding, and to investigate any matrix-specific efficiency problems.

SYMBIOTIC BACTERIA APPEAR TO MEDIATE HYENA SOCIAL ODORS
Keith Koonter
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 308
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Kevin Theis (Microbiology)

Both the stripped and the spotted hyena rely on chemical scents for communication. These scents are produced in scent pouches that are home to symbiotic bacteria that are responsible for these communicative odors. This process can be explained by the fermentation hypothesis for mammalian chemical communication. The odorous metabolites allow the hyenas to scent mark and give status of an individual as well as many other identifying features. The variation of these bacteria and the variation of the community within each pouch allows for varied signals in each individual. Testing this hypothesis requires that communities of these bacteria are sampled from the scent pouches of both the stripped and spotted hyena. Genetic sequencing reveals these communities dominated by fermentative bacteria. For comparison fatty acid profiles differ from species to species and also differ in age and sex of the hyenas. Results strongly support the fermentation hypothesis for chemical communication.

IRF6 AND TWIST1 INTERACT GENETICALLY DURING MANDIBULAR DEVELOPMENT
David Huver
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 309
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Walid Fakhouri (Diagnostic and Biomedical Sciences Education), Brian Schutte (Microbiology & Molecular Genetics)

Interferon Regulatory Factor 6 (IRF6) and TWIST1 are transcription factors that play crucial roles in craniofacial development in the mammilian system. While each gene produces distinct phenotypes, Van der Woude Syndrome (VWS) and Popliteal Pterygium syndrome caused by IRF6 mutations and Saethre-Chotzen syndrome (SCS) by TWIST1 DNA mutation, we have discovered a novel genetic interaction between Irf6 and TWIST1 involved in mandibular development.

UNIVERSAL FLU VACCINE
Lucas Weingartz, Dawei Chen, Sam Decker
Category: Microbiology, Immunology, and Infectious Disease, Section 1
Poster: 310
Location: Ballroom, 9:30 AM-11:15 AM
Mentor(s): Mark Largent (Lyman Briggs College)

The poster presentation identifies the challenges facing the current flu vaccine. It demonstrates a potential alternative to the current vaccine using stimulation of CD8 T-cells to attack basic proteins in all influenza viruses, thus eliminating the need for the current vaccine, which promotes immunity through vaccination with weakened strains of the virus. Furthermore, it will identify potential implications of the use of such a vaccine.

POSTER PRESENTATIONS, SECTION 2

VARIATION IN BIOFILM FORMATION AMONG SHIGA TOXIN-PRODUCING ESCHERICHIA COLI ISOLATED FROM BEEF CATTLE IN MICHIGAN
Kai Philip Hussnaetter
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 313
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Shannon Manning (Microbiology & Molecular Genetics)

Shiga toxin-producing Escherichia coli (STEC) is a foodborne pathogen that can cause (bloody) diarrhea that can lead to kidney failure or death. Cattle serve as a reservoir of STEC and improper handling at processing plants, undercooked meat,and dairy products, and agricultural runoff from cattle farms have been implicated in the dissemination of this pathogen. Some STEC have been reported to form biofilms, a mechanism that allows bacteria to survive inside a protective substance and contributes to nutrient sharing and antibiotic tolerance. Few studies, have attempted to determine whether biofilm formation is associated with super shedding or persistent STEC colonization in cattle. We examined 97 STEC isolates from fecal grabs of 19 commercial feedlot cattle at four time points for their ability to form biofilms in vitro by staining with

0.1% crystal violet quantified at A595 following 48 hours at 25°C. Among all 97 strains, we observed considerable variation among the STEC isolates with 25 producing no biofilms (A595<0.5), 19 producing moderate (A595=0.5-2.0) and 53 producing strong biofilms (A595>2.0). Additionally, 11 of the 14 animals with strong biofilm formers were more frequently colonized at ≥2 time points ($p<0.05$), while only 1 of the 5 animals without biofilm formers were colonized at subsequent time points. These data suggest that biofilm production may be important for persistent STEC shedding in cattle that could guide future prevention strategies. Future studies will focus on creating mutants to disrupt biofilm formation and identify genes responsible for biofilm formation.

INVESTIGATING THE TAXONOMIC AND PHYLOGENETIC FEATURES OF EMERGING MAMMALIAN PATHOGENIC OOMYCETES IN THE GENUS LAGENIDIUM.
Behirda Karaj
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 314
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Leonel Mendoza (Biomedical Laboratory Diagnostics)

For the past 10 years a new emerging oomycete pathogenic species in the genus Lagenidium was found causing life threatening cutaneous and systemic infections in mammals including humans. Lagenidium is the second oomycete, other than Pythium insidiosum, that can cause infection in mammalian hosts. The oomycetes are famous because they have evolved, by horizontal transfer of genes, virulence factors to affect plants, algae, other oomycetes, animals such as: fish, insects, arthropods, and humans. We have had the opportunity to investigate an emerging Lagenidium species, causing keratitis on a Thai human patient. Our study focuses on the emerging pathogen, Lagenidium albertoi ATCC MYA-4932 (MTLA-13) (yet to be properly described). The purpose of our research was to extract genomic DNA from the isolate L. albertoi and PCR amplify the ITS DNA sequences to be then compared to the DNA sequences available at the NCBI. We also performed morphological physiological (temperature) studies to compare its taxonomic features with the already described Lagenidium species. We tested the ATCC MYA-4932 strain in different media and at different temperatures (25ºC, 30ºC and 37ºC). Except for one of the tested media, L. albertoi grew well in all media and at the tested temperatures. The growth rate of this pathogen under different nutritional and environmental conditions was measured every other day. The structural taxonomic changes were observed microscopically and recorded. Our observations on the taxonomic and phylogenetic features of this emerging pathogen would be of importance in clinical identification of L.albertoi in patients with lagenidiosis.

USING MAGNETIC NANOPARTICLES TO EXTRACT PATHOGENIC BACTERIA
Kasey Pryg
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 315
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Evangelyn Alocilja (Biosystems and Agricultural Engineering), Patrick Fewins (Biosystems and Agricultural Engineering)

The current method for diagnosing tuberculosis in low-income countries involves simple sputum smear microscopy, in which the accuracy conventionally ranges from 32% - 92% (1). As a way to improve this microscopic diagnostic test, a proof of concept has been designed which will increase the concentration of the sample and therefore hopefully increase the accuracy of the diagnosis. Using non-specific magnetic polyaniline (PANI) as a mechanical separator and E. coli O157:H7 as a generic target bacteria, it was shown that a sample could be concentrated and improved from the current diagnostic method. Magnetic separation from spiked sample enables the concentration of the target bacteria in a sample, which in turn allows for more cells to be captured on the microscopic slide and an increased presence of the target bacteria. Hopefully, this method can be used in low-income countries to improve the accuracy of tuberculosis testing across the world. 1. Cicero F. F. Costa Filho and Marly G. F. Costa (2012). Sputum Smear Microscopy for Tuberculosis: Evaluation of Autofocus Functions and Automatic Identification of Tuberculosis Mycobacterium, Understanding Tuberculosis - Global Experiences and Innovative Approaches to the Diagnosis, Dr. Pere-Joan Cardona (Ed.), ISBN: 978-953-307-938-7, InTech.

NEUROTENSIN NEURONS IN THE LATERAL HYPOTHALAMIC AREA PROJECT TO THE VENTRAL TEGMENTAL AREA: A NOVEL NEURAL CIRCUIT TO MODULATE ENERGY BALANCE
Janaan Meyers
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 316
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Gina Leinninger (Physiology), Hillary Woodworth (Physiology)

To maintain survival the brain must coordinate energy cues with goal directed behaviors to modify energy intake. This includes promoting food seeking when energy reserves are low (fasting) or attenuating feeding when they are high (during energy repletion or obesity). Neurons in the lateral hypothalamic area (LHA) are important coordinators of energy balance and behavior via their innervation of the Ventral Tegmental Area (VTA), a brain area that regulates locomotor activity and

the incentivized intake of food. For example, LHA Orexin neurons are activated during fasting to promote alertness and food intake. We identified a large group of non-Orexin LHA neurons that contain Neurotensin (Nts) and innervate the VTA: we therefore hypothesized that LHA Nts neurons might also regulate energy intake. Some LHA Nts neurons express the long form of the leptin receptor (LepRb) and are activated by leptin, a signal of energy excess: we refer to these as NtsLepRb neurons. We therefore examined whether these NtsLepRb neurons specifically project to and regulate the VTA. Our data reveal populations of LHA Nts neurons that are regulated by energy balance stimuli (including leptin) and which are poised to coordinate energy balance cues and motivated behaviors.

WOLBACHIA'S INTERACTION WITH AEDES AEGYPTI INNATE IMMUNE PATHWAYS
Michael McFadden
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 317
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Zhiyong Xi (Microbiology & Molecular Genetics)

The successful introduction of Wolbachia into Aedes spp has created avenues for various population replacement strategies. In addition to its potential as a transgene driver, Wolbachia also manipulates phenotypic aspects of its host, such as regulation of innate immunity. However, Wolbachia's relationship with the Aedes immune system is not well understood. Here, we utilized transgenesis to observe the effect of multiple immune pathways on the density of Wolbachia wAlbB populations in Aedes aegypti. We overexpressed the NF- κB factors Rel1 and Rel2, downstream activators of Toll and IMD immune pathways, respectively. The vitellogenin gene promoter was used to create three transgenic strains overexpressing either Rel1, Rel2, or a hybrid expressing both. After bloodmeal-induced expression of transgenes, we found no significant difference in Wolbachia density between wild-type and transgenic, wAlbB infected mosquitoes. However, in each case, Wolbachia density increased post-bloodmeal. This demonstrates Wolbachia's ability to evade its host immune response, even under conditions lethal to many invading microbes. Wolbachia, therefore, can survive in a mosquito with altered immunity, presenting an opportunity for super immune mosquitoes with multiple mechanisms of pathogen blocking.

THE CONTRIBUTION OF CORTICOTROPIN RELEASING HORMONE AND SEROTONIN SIGNALING IN INDUCING SYMPTOMS OF IRRITABLE BOWEL SYNDROME IN RATS
Andrew Mecca
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 318
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): James Galligan (Neuroscience)

Irritable bowel syndrome (IBS) is a common functional gastrointestinal disorder characterized by abdominal pain and changes in digestive motility. IBS affects 10-20% of the population and is more prevalent in women than in men. The higher occurrence of IBS in the female population suggests a gonadal hormone interaction that may be influenced by both corticotropin releasing hormone (CRH) and serotonin regulation in the gut. CRH is a likely candidate in studying the pathophysiology of IBS as it has been shown to mediate the stress response characterized by alterations in colonic motility and visceral hypersensitivity. The relationship between CRH and serotonin in the study of IBS will be studied in a novel serotonin transporter gene (SERT) knockout (KO) rat model. This is a unique model because the SERTKO is unusual in the rat species, and is easier to investigate compared to mice.

SMALL TALK: UNDERSTANDING THE ROLE OF QUORUM SENSING IN LOW-DENSITY VIBRIO HARVEYI POPULATIONS
Markus Sievertsen
Category: Microbiology, Immunology, and Infectious Disease, Section 2
Poster: 319
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Christopher Waters (Microbiology and Molecular Genetics)

It was long thought that bacteria, while existing in large groups, functioned as asocial individuals, lacking complex organization or communication. However, bacteria do possess an ability to communicate among themselves, utilizing a process known as quorum sensing. Via this mechanism, bacteria signal each other by secreting molecules called autoinducers, which are received at receptors in each cell. When bacterial population density sufficiently increases, the correlated concentration of autoinducers reaches a critical point, switching the bacteria between a low- to high-cell density state. Typically, hundreds of different genes are regulated by quorum sensing. In the marine bacterium Vibrio harveyi, the high cell density quorum sensing state induces many behaviors, including bioluminescence and extracellular protease production. Extracellular proteases allow V. harveyi to degrade and grow on proteins. In turn, many genes are only expressed at low cell density. However, the impact of low cell density genes on V. harveyi biology is poorly understood. One such protein expressed at low cell density is responsible for metabolizing chitin, a prevalent aquatic polymer that is the primary carbon and nitrogen source of V. harveyi. To understand the effects of quorum sensing in the low-density state, I will explore the ability of V. harveyi to grow on chitin in a quorum sensing-dependent manner. By studying the behaviors of V. harveyi in

the low-density state, a clearer picture of the role of quorum-sensing in V. harveyi biology can be obtained, allowing us to learn fundamental principles of how chemical communication systems are integrated into microbial growth.

POSTER PRESENTATIONS, SECTION 3

ACIDIC EXPOSURE AND ENCHANCED COLONIZATION IN GROUP B STREPTOCOCCUS
Clare Laut
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 322
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Shannon Manning (Microbiology and Molecular Genetics)

Group B Streptococcus (GBS) is a gram-positive bacterium responsible for the majority of cases of neonatal meningitis and sepsis, and is an emerging pathogen of immunocompromised adults. Present as a commensal in the lower gastrointestinal tract in ~40% of the population, identification of bacterial factors driving pathogenesis remains a significant public health challenge. Multilocus sequence typing has identified phylogenetically distinct lineages associated with human colonization and disease, such as ST-23 and ST-17, respectively; however, underlying phenotypic and transcriptomic differences affecting infection outcomes remain obscured. The ability to form strong biofilms is an identified virulence factor in similar bacterial species. Within sequence types of GBS, our lab has shown that there is variation in the biofilm-forming ability although determinants and effects of this variation are unknown. Exposure to acidic pH, as is found in the vaginal tract, has been shown to lead to increased levels of attachment to host cells by GBS, however this phenomenon has never been examined across sequence types or been related to biofilm phenotype. The aim of this project is to assess the role of biofilm and acid-response in host colonization using a biofilm assay, eukaryotic cell-association assay, and RNAseq data. It is hypothesized based upon preliminary testing that an acidic pH leads to relatively increased attachment in strong and weak biofilm formation isolates. If a correlation can be shown between the acidic vaginal tract environment and the pathogenic factors of GBS, there can be a better understanding of its mode of infection.

KNOCKOUT CELL LINE
Mrinal Asopa
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 323
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Yong-Hui Zheng (Microbiology and Molecular Genetics)

My presentation will be on the affect of the knockout cell line on TPSO and on different Virus envelopes whose protein contents and membrane contents can be measured through sequencing. I will be displaying the differences of the cell envelopes with figures such as PCR and gel electropheresis. Along with TSPO, I will also be examing other viruses and their envelopes to see the changes that occur throughout the experiment, including EDEM1, EDEM2, EDEM3, ERMAN1. I hope to prove that the knockout cell line has an affect on the growth and the envelopes of these viruses.

GRHL3 REGULATES TOOTH DEVELOPMENT IN THE MOUSE
Ari Walter
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 324
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Brian Schutte (Microbiology & Molecular Genetics)

Mutations in GRHL3 lead to Van der Woude Syndrome (VWS), dominantly inherited orofacial clefting. Individuals with VWS can have a constellation of features, including cleft lip and palate, lip pits and hypodontia. Of 400 syndromes that can lead to orofacial clefting, VWS is the most common. Common and complex hypodontia, or missing teeth, results in significant morbidity. In this work, we investigate the pathophysiological mechanism leading to hypodontia. As in humans, loss of Grhl3 in the mouse leads to orofacial clefting. However, the role of Grhl3 in tooth germ development, or odontogenesis, has not been investigated. Like orofacial clefting, we predict that loss of Grhl3 in the mouse leads to dental defects. To understand the mechanism, we further delineate the markers and tissues regulating odontogenesis. To answer these questions, we use a mouse model to determine how Grhl3 regulates tooth development. Molecularly, we show that Grhl3 is expressed in both the dental epithelium and dental mesenchyme from E13.5 to E17.5. Seeing that Grhl3 is expressed during odontogenesis, we ask if loss of Grhl3 leads to dental defects. Consistent with our predication, we find that loss of Grhl3 leads to gross oral cavity deformations, including unilateral oral adhesions superficial to the molar tooth germ. Significantly, Grhl3 knockout embryos exhibited a dysmorphic dental follicle and papilla. This data strongly suggests that Grhl3 cell-autonomously regulates odontogenesis in both the dental epithelium and mesenchyme as early as E13.5.

ASSESSMENT OF PROPHAGE PRESENCE AND RELATEDNESS IN BACTERIAL ISOLATES FROM BIOENERGY CROPS
Anya Nikolai
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 325
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): James Tiedje (Crop and Soil Sciences)

Recent work in the Tiedje lab has shown unexpectedly high levels of prophage activity in soils associated with the bioenergy crop Miscanthus giganteus. Studies show that approximately 30% of cultivable soil bacteria contain inducible prophage. The genomes of several bacterial isolates from leaves, roots, and rhizosphere soil of Panicum virgatum and Miscanthus giganteus show evidence of prophage sequences in their genomes. The goal of this study is to determine the prevalence and relatedness of inducible prophage found in bacteria isolated from bioenergy crops and to begin to answer whether or not protective immunity occurs in the rhizosphere. An induction assay was performed by exposing the bacteria isolates to mitomycin C. We found that nearly half had inducible prophage. Prophage genomes were sequenced using Illumina high-throughput sequencing. Sequences were analyzed using ACLAME and BLAST databases to determine phylogenetic relatedness of the prophage from the bacterial isolates. These results allow us to further understand the complex rhizosphere.

INVESTIGATING THE ROLE OF HYPER-PSEUDOPILIS FORMATION IN THE TYPE-2 SECRETION SYSTEM OF VIBRIO CHOLERAE
John Shook
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 326
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Christopher Waters (Microbiology and Molecular Genetics)

Biofilms are bacterial communities composed of extracellular polysaccharides, DNA and protein that form on surfaces, contaminating industrial and medical equipment. Biofilms are also strongly associated with persistent infections. Understanding the molecular mechanisms of biofilm formation will provide new targets to inhibit this process. Recently it has been shown that the Type-2 Secretion System (T2SS) may play a role in biofilm formation. The T2SS is a broad secretion system that spans both the inner and outer membrane of Gram negative bacteria, functioning to secrete fully folded proteins from the periplasm into the extracellular environment. The T2SS is a multimeric complex with the protein EpsG acting as a pseudo-pilus to mechanically push the fully folded proteins out of the cell. We hypothesize that under certain circumstances, EpsG forms a hyper-psuedopilis which extends from the cell surface promoting biofilm formation. The genes encoding the T2SS are driven by two distinct promoter sequences, one located at the start of the T2SS operon and the other found just upstream of epsG. The isolated promoter sequences will be positioned in a dual reporter plasmid driving expression of the fluorescent proteins gfp and mCherry. Through transposon mutagenesis and flow cytometry, we will identify mutants which exhibit differential expression of the promoters and determine if this impacts hyper-psuedopilis and biofilm formation. This research will help identify the role of epsG in V. cholerae biofilm formation, and determine if targeting the T2SS is a viable alternative to prevent biofilms.

IDENTIFICATION OF NOVEL C-DE-GMP INDEPENDENT TRANSCRIPTION FACTORS
Jennifer Nyberg
Category: Microbiology, Immunology, and Infectious Disease, Section 3
Poster: 327
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Chris 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. My research project has centered on understanding how c-di-GMP controls transcription in the pathogen Vibrio cholerae. Biofilms are highly tolerant to antibiotics and are a widespread medical problem, such as in diabetic foot ulcers or on artificial surfaces such as a hip replacement. It is important to understand the mechanisms that are involved in inducing biofilm formation to determine how to best treat them. The goal of my project is to identify the molecular mechanisms that control the promoter of 6:C9, a gene in V. cholerae that is induced by c-di-GMP. To accomplish this, I am performing a genetic screen to isolate mutants of V. cholerae that no longer show an induction of 6:C9 at high levels of c-di-GMP. I have generated a random library of transposon mutants in V. cholerae, and I have screened 2,000 clones for the loss of 6:C9 induction by c-di-GMP. I have found five mutants that show the loss of 6:C9 induction by c-di-GMP. We have determined that in one of the mutants, 14:C11, the mutation has occurred in the region: VCA0334. As I continue my research I hope to find 6:C9 mutants that are c-di-GMP dependent transcription factors in V. cholerae.

MODELING THE PHYSIOLOGICAL RESPONSE OF SALMONELLA TO HEAT SHOCK DURING SLOW COOKING PROCESSES
Laura Carroll
Category: Microbiology, Immunology, and Infectious Disease, Section 3

Poster: 328
Location: Third Floor Hallway, 1:30 PM-3:30 PM
Mentor(s): Bradley Marks (Biosystems and Agricultural Engineering)

Sublethal heating, as can occur during slow cooking, is known to induce increased thermal resistance in Salmonella. Although several studies have reported improved thermal inactivation models that include the effect of prior sublethal history on subsequent thermal resistance, none of these models are based on cellular-level responses to the sublethal conditions. The goal of this study was to quantify Salmonella's response to heat stress induced by prolonged exposure to sublethal temperatures by using both molecular and culture-based approaches. To accomplish this, aliquots of Salmonella that had been inoculated into trypticase soy broth were held at a sublethal temperature of either 40°C or 45°C for times ranging from 0 to 180 minutes using a PCR thermocycler. For the molecular approach, cDNA from the samples was used to quantify transcript levels for six heat stress genes using qPCR. Only ibpA displayed significant changes (α = 0.10) in transcript level over time, with a significant increase in the first 15 min at both 40°C and 45°C, followed by a decrease to a final level that remained greater than the initial transcript level in samples held at 45°C ($P < 0.10$). For the culture-based approach, samples were diluted and plated on selective and non-selective media to compare uninjured and total populations, respectively. Significant injury was seen in all samples held at their respective temperatures for 15 and 30 min, while samples held at 45°C for 60 min also displayed significant levels of injury ($P < 0.05$).

PHYSICAL SCIENCES

POSTER PRESENTATIONS, SECTION 1

EFFECT OF DEOXIDATION PRETREATMENT ON THE CORROSION INHIBITION PROVIDED BY A TRIVALENT CHROMIUM PROCESS (TCP) CONVERSION COATING ON AA2024-T3

Annika De Souza
Category: Physical Sciences, Section 1
Poster: 335
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Greg Swain (Chemistry)

Aluminum alloy surfaces are typically (i) degreased and (ii) deoxidized and/or desmutted to expose a clean and low-oxygen surface in preparation for the application of a pretreatment conversion coating. We hypothesized that the corrosion inhibition provided by one type of conversion coating, trivalent chromium process (TCP), would depend on the deoxidation chemistry and treatment time due to effects on the specimen's surface cleanliness and surface roughness, pit density, and pit depth. To this end, the effect of treatment time in acidic fluoride deoxidizer/desmutter on the corrosion inhibition provided by a TCP coating on AA2024-T3 was studied. Longer treatment times of 6 and 12 min produced greater surface roughness, pit density and pit depth than shorter times of 0.5 and 2 min. As a consequence, the TCP coating formed less completely and with more defects than the former surfaces. Greater corrosion inhibition was found on the less damaged specimens as evidenced by decreased anodic and cathodic currents in polarization curves, increased polarization resistances, R_p, and more positive breakdown or pitting potentials, E_{pit}, in a choride-containing electrolyte solution. Deoxidation in 0.1 M NaOH was also investigated because of the more uniform aluminum dissolution that occurs in this medium. These specimen surfaces remained relatively smooth with the TCP coating providing the greatest level of corrosion inhibition, as evidenced by larger R_p and more positive E_{pit}. This is attributed to reduced surface roughing and pitting as well as the formation of an inert oxide on the exposed copper intermetallics.

ELECTROCATALYTIC HYDROGENATION OF BIO-OIL COMPONENTS: A FORAY INTO ALTERNATIVE ENERGY

Michaelyn Lux, Kelsey Longe
Category: Physical Sciences, Section 1
Poster: 336
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): James Jackson (Chemistry)

Bio-oil, a pyrolysis product of biomass, is a promising potential energy source, except for its low energy density and its capability to polymerize. The aim of this project is to utilize a Solid Polymer Electrolyte (SPE) system for electrocatalytic hydrogenation (ECH) to increase the energy density and stabilize the various components of bio-oil. The goal of the project is to identify ideal optimizing conditions, especially those that maximize the current efficiency of this system. Previously, the ideal cathode side catalyst and current collector material was found to be Monel, a nickel and copper alloy. After determining the ideal current collector, the reaction conditions of the electrocatalytic reduction were changed in order to maximize the current efficiency; specifically, a metal doping system was implemented to see if the addition of nickel chloride, nickel acetate or iron chloride to the system improved the current efficiency. By determining the ideal reaction conditions for this fuel upgrading process, the hydrogenation of bio-oil has become more feasible.

IMPROVEMENT IN THE SN RATIO OF COLLINEAR LASER SPECTROSCOPY USING A SPATIAL FILTER
Justin Harris
Category: Physical Sciences, Section 1
Poster: 337
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Paul Mantica (Chemistry)

Collinear laser spectroscopy (CLS) experiments are performed at the BEam COoler and LAser Spectroscopy (BECOLA) facility at the National Superconducting Cyclotron Laboratory at Michigan State University. Charge radii and electromagnetic moments of radioactive isotopes are determined from the isotope shift and hyperfine structure, respectively, using laser-induced fluorescence measurements. As a means to improve the signal-to-noise ratio for fluorescence detection, a spatial filter was installed along the laser light path. The spatial filter consisted of two lenses that formed a telescope, and a pinhole with a 15 micro-meter diameter in between. The first lens focused the laser light so that only the lowest-order Gaussian-shaped light component went through the pinhole. The second lens was used to converge the laser light through the CLS beam line. The performance characteristics were checked using laser light at 770 nm. Two-dimensional profiles were measured along the laser path, and the background photon rate was monitored in a photomultiplier tube. The improvement in signal-to-noise is attributed to a reduction in the background from scattered laser light. The result of the tests and the photon detection sensitivity limit of BECOLA for CLS measurements will be discussed. This work supported in part by the National Science Foundation Grant No. PHY-11-02511 and PHY-12-28489.

COMPARISON OF GRAIN SURFACE TEXTURES BETWEEN MARS PHOENIX LANDER SAMPLES AND A TERRESTRIAL ANALOG
Aharon Wayne, Lucas Hicks
Category: Physical Sciences, Section 1
Poster: 338
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Benjamin Brugman (Environmental Geosciences), Michael Velbel (Geological Sciences)

In 2008, the Mars Phoenix Lander collected samples from its landing site on the northern plains of Mars. It used its robotic arm (RA) to collect samples and analyzed them with an MECA (Microscopy, Electrochemistry, and Conductivity Analyzer) instrument package. In addition, one camera analyzed the surrounding area while another, located on the RA, took images of the grain samples before placing them in the onboard Optical Microscope (OM). For this study, two samples were taken from a terrestrial analog in the MI Saginaw Lowlands: one from the wall of an ice-wedge cast in the permafrost landscape (L5), and one from glacial till just outside the cast (L8). L5, grain samples were, on average, 15% larger than samples from L8. To interpret potential weathering and transport process abrasion on the grains imaged by the OM at the Phoenix landing site, the analogous sample of terrestrial sand was examined for various surface textures, of which both samples contained a large variety. The terrestrial analog grains were imaged by Michigan State University's Scanning Electron Microscope in the Center for Advanced Microscopy and compared to images of grains with characteristic surface features. Both samples were dominated by grains of low sphericity and moderate angularity. Well-rounded, high sphericity grains can result from aeolian processes, water transport, and freeze/thaw cycles. If this is so, we expect to see more rounded grains in the L5 sample than L8, which we will analyze next, along with roundness of the Phoenix sample.

LASER POWER STABILIZATION FOR COLLINEAR LASER SPECTROSCOPY ON 37K AT BECOLA
Ryan Strum
Category: Physical Sciences, Section 1
Poster: 339
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Paul Mantica (Chemistry), Kei Minamisono (NSCL)

Collinear laser spectroscopy (CLS) experiments are performed at the BEam COoler and LAser Spectroscopy (BECOLA) facility at the National Superconducting Cyclotron Laboratory at Michigan State University. Charge radii and electromagnetic moments of radioactive isotopes are determined from isotope shift and hyperfine structure measurements, respectively, using laser-induced fluorescence detection. A photomultiplier tube (PMT) is used to detect resonant fluorescence, and it is critical to have a good signal-to-noise ratio to be sensitive to observe the weak fluorescence signals from the small sample sizes of the radioactive isotopes under study. A laser power controller (LPC) was installed to decrease the laser background and increase signal-to-noise ratio. The LPC consists of a liquid-crystal wave plate on a feedback loop. The LPC effectively reduced the baseline fluctuation in the hyperfine spectra caused by intensity fluctuations of the incident laser light, resulting in a higher signal-to-noise ratio. The performance characteristics of the LPC were checked by measuring the laser power at 770 nm and the background rate using the PMT. The LPC was then used successfully in the first online experiment at BECOLA to determine the magnetic-dipole moment and charge radius of radioactive 37K. The result of the online experiment and the operating characteristics of the LPC will be discussed. This work supported in part by the National Science Foundation Grant Nos. PHY-11-02511 and PHY-12-28489.

GEOCHEMISTRY OF LAVAS FROM THE KAIAPO TUFF CONE, TAUPO VOLCANIC ZONE, NEW ZEALAND: LAVA HETEROGENEITY WITHIN A SINGLE CONE
Nicholas Martin
Category: Physical Sciences, Section 1
Poster: 340
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Tyrone Rooney (Geological Sciences)

The Taupo Volcanic Zone (TVZ) in New Zealand is an extremely productive silicic volcanic center. Small basaltic eruptions are crucial to understanding geochemical variations within it. Regional-scale differences in basaltic geochemsitry have been established; however, smaller-scale heterogeneity hasn't been explored. The Kaiapo tuff cone is located in the southern TVZ. Basalts collected from this center exhibit petrographic heterogeneity in their degree of crystallinity, which is inconsistent with a monogenetic origin for these lavas. Lavas analyzed extend over a limited range of MgO and are divided into two distinct groups on the basis of titanium. The high-Ti group contains samples with high Ti, Na, Zr, Nb, Nd, and Ce, while the low-Ti group contains samples with elevated Al and Ca. Spider diagrams reveal that the high-Ti group usually exhibits incompatible trace element enrichment, overlapping with the low-Ti group only in Sr. The broad patterns of high-field strength element depletion and large-ion lithophile element enrichment in the Kaiapo tuff cone lavas are consistent with an origin from a fluid fluxed mantle wedge, similar to other basalts in the TVZ. The Kaiapo tuff cone lies within the TVZ's CW-2 segment, where variation in basalt geochemistry exists in terms of two distinct primitive lavas. Uniquely, the two lava groups at the Kaiapo tuff cone correlate with the end members identified in CW-2. Our findings reveal the potentially heterogeneous compositions of lavas in 'monogenetic' cones within the TVZ and highlight the need for multiple analyses constraining the spectrum of geochemical variation in this region.

PROXIMITY EFFECTS OF IRON BASED SUPERCONDUCTORS WITH A SPIN DENSITY WAVE
Noah Green
Category: Physical Sciences, Section 1
Poster: 341
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Alex Levchenko (Physics and Astronomy)

I use the Ginzburg-Landau theory of superconductors to predict proximity effects of iron-based superconductors (FeSCs) with a spin density wave (SDW). It is well established that both superconducting and SDW orders can coexist in certain doped FeSCs. Since this is a two order parameter system, I base my model on the already established model of two-band SCs. However, I instead use a magnetic order parameter to account for a SDW interaction with the superconducting order. Using this model, I calculate Josephson current phase relationships for weak links of a FeSC-normal metal-FeSC configuration, and analyze the dependence of the critical current on temperature and doping.

STRUCTURAL CHEMISTRY AND MAGNETIC PROPERTIES OF COPPER PYROMELLITATE COORDINATION POLYMERS CONTAINING PYRIDYLNICOTINAMIDE LIGANDS
Jessica Mizzi
Category: Physical Sciences, Section 1
Poster: 342
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Robert LaDuca (Chemistry)

A series of divalent copper pyromellitate (1,2,4,5-benzenetetracarboxylate, pyro) coordination polymers containing either 3-pyridylnicotinamide (3-pna) or 4-pyridylnicotinamide (4-pna) was hydrothermally prepared and structurally characterized by single-crystal X-ray diffraction. $[Cu_2(pyro)(pyroH_2)(3\text{-}pnaH)_2(H_2O)_2]_n$ (1) is a 2-D coordination polymer built from $\{Cu_2O_2(OCO)_2\}$ dimeric units, while $\{[Cu(pyro)(3\text{-}pnaH)_2(H_2O)_2]\bullet 4H_2O\}_n$ (2) is a simple neutral 1-D chain polymer. $\{[Cu(pyroH_2)(4\text{-}pnaH)_2(H_2O)_2](pyroH_2)\bullet 2H_2O\}_n$ (3) possesses cationic 1-D chain motifs and unligated pyroH2 dianions. $\{[Cu_2(pyroH_2)_3(4\text{-}pnaH)_2]\bullet 6H_2O\}_n$ (4) is also a 1-D coordination polymer, but built from the linkage of $\{Cu_2(pyroH_2)\}$ dimeric units. $\{[Cu_3(pyroH)_2(4\text{-}pna)_2(H_2O)_2]\bullet 2H_2O\}_n$ (5) manifests a 3-D coordination polymer network with rare frl topology, containing embedded $\{Cu_3(OCO)_2\}$ linear trimers. Moderately strong antiferromagnetic coupling (J = –76.4(3) cm^{-1}) was observed within the $\{Cu_2O_2(OCO)_2\}$ dimeric units in 1, while very weak ferromagnetic coupling (J = 0.8(2) cm^{-1}) was observed within the $\{Cu_3(OCO)_2\}$ linear trimers in 5.

POSTER PRESENTATIONS, SECTION 2

MERCURY AND SELENIUM DEVELOPMENT FOR THE FACILITY FOR RARE ISOTOPE BEAMS (FRIB)
Derek Neben
Category: Physical Sciences, Section 2
Poster: 344
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Daniela Leitner (Physics and Astronomy), Guillaume Machicoane (NSCL-FRIB)

The Facility for Rare Isotope Beams (FRIB) at Michigan State University (MSU) is under construction to provide 400 kW of beam power onto a target with energies surpassing 200 Mev/u. The front end ion source, modeled after the 28 GHz Versatile ECR Ion Source for Nuclear Science (VENUS), will need to extract an ion beam of approximately 0.5 emA with an A/Q between 3 and 7 in order to meet design specifications. The FRIB primary beam list includes metals such as uranium, mercury, selenium, and samarium. We report here the development of two elements, mercury and selenium, with the 14 GHz Advanced Room TEMperature Ion Source (ARTEMIS) using the Metal Ions from VOlatile Compounds (MIVOC) method.

THE INTERSTELLAR ASSEMBLY LINE: THE PRODUCTION OF P-NUCLEI VIA THE P-PROCESS IN STARS
Sara Denbo
Category: Physical Sciences, Section 2
Poster: 345
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Artemis Spyrou (Physics and Astronomy)

While hydrogen and helium were created as a result of the Big Bang, all elements heavier than these are created in the dramatic lives and deaths of stars. The production of the class of stable, neutron deficient isotopes known as p-nuclei is currently one of the least understood processes of nucleosynthesis. Their creation cannot be explained solely by the r- and s-processes, which are responsible for the synthesis of the majority of the heavy elements. Current evidence suggests that the not well understood p-process could solve the mystery of these p-nuclei. In order to learn more, it is crucial to acquire accurate measurements of the cross sections, or probabilities, of the appropriate reactions at astrophysical conditions. This research focuses on the ^{113}In(p,γ)^{114}Sn reaction, utilizing data gathered via the National Superconducting Cyclotron Laboratory's SuN (Summing NaI(Tl)) gamma ray detector. Presented are measurements of the cross section of this reaction at different energies measured with SuN at the FN Tandem Accelerator at the University of Notre Dame. Also presented is a possible new technique for the analysis of gamma ray peaks in the data that are overwhelmed by background and preliminary cross section estimates carried out via this technique. This information will allow us to better understand the creation of the p-nuclei, a great mystery in the field of nuclear astrophysics.

A STATISTICAL ANALYSIS OF BACKGROUND CONTRIBUTIONS FOR EXPERIMENTS MEASURING NEUTRINOLESS DOUBLE BETA DECAY
Stephen Mee
Category: Physical Sciences, Section 2
Poster: 346
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Artemis Spyrou (Physics and Astronomy)

Large-scale experiments are underway to observe the neutrinoless double-beta decay of ^{76}Ge with a respective energy of 2039.0-keV. A 2040.7-keV γ ray from the 69th excited state of ^{76}Ge could create false signals in the ^{76}Ge-enriched detectors used in these experiments. It is therefore crucial to estimate the background contribution of this 2040.7-keV γ-line. A recent experiment performed at the National Superconducting Cyclotron Laboratory was able to populate the energy state of interest and observe the 2040.7-keV γ-line. The present work focuses on the statistical analysis of this experiment in order to determine the branching ratio of the 2040.7-keV γ ray from the 69th excited state of ^{76}Ge. This branching ratio is to be applied to experiments attempting to observe $0\nu\beta\beta$ events. Successful observations of $0\nu\beta\beta$ events would be the best way to obtain the mass of the neutrino and determine its nature as a Dirac or Majorana fermion.

STERIC EFFECTS ON THE STRUCTURE OF COPPER MALONATE COORDINATION POLYMERS CONTAINING 1,3-DI(4-PYRIDYL)PROPANE
Brandon Stone
Category: Physical Sciences, Section 2
Poster: 347
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Robert LaDuca (Lyman Briggs College)

Slow diffusion of aqueous solutions of copper dicarboxylate precursors with ethanolic solutions of 1,3-di(4-pyridyl)propane (dpp) afforded three different coordination polymers whose dimensionality and topology depends critically on the steric bulk of the malonate ligand. The new phases were characterized by single-crystal X-ray diffraction, and were analyzed by infrared spectroscopy and thermogravimetry. Using the unsubstituted parent malonate ligand (mal), the complex phase {[Cu(dpp)2(H2O)] [Cu(mal)2(dpp)][Cu(mal)(dpp)(H2O)]•12H2O}n (1) was obtained. Its crystal structure shows the interweaving of cationic layer, anionic chain, and neutral chain motifs to give a 1D + 1D + 2D → 3D network. Utilizing the sterically bulkier dimethylmalonate (dmmal) ligand afforded [Cu(dmmal)(dpp)(H2O)]•3H2O}n (2), which shows a simple neutral (4,4) grid topology. [Cu(dpp)2][Cu(emal)2]•6H2O}n (3, emal = ethylmalonate) manifests cationic ribbon motifs and coordination complex anions. Thermal properties of these materials are also discussed.

ADVANCEMENTS IN BETA-GAMMA COINCIDENT DETECTION IN A NOVEL DETECTOR
Alexander Chemey
Category: Physical Sciences, Section 2
Poster: 348
Location: Second Floor Concourse, 1:30 PM-3:30 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. Though able to detect explosions in water, air, earth, and space, it is only through the collection of radioactive materials that observers may determine if it was a nuclear explosion, or merely a very large conventional blast. The materials selected for radiation analysis must escape through fissures in rock, have sufficiently large half-lives to be measured after some elapsed time, and be produced in large quantities from a successful 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 xenon-133, -135, -131m, 133m, and 135m. From these isotopes and isomers, we may determine the nuclear nature of the blast and, if nuclear, the fuel used. This project is simulating the beta-gamma coincidence detection of radioactive xenon isotopes in a high-purity planar germanium double-sided strip detector. Since this time last year, the algorithms have advanced significantly. Over the last year, the existing capabilities have been verified, maintained, and expanded upon. Now, different radiations that deposit simultaneously into the detector can be discriminated between, and electrons can be identified independently of gamma rays. Present research is in development of new algorithms to easily output isotope and isomer ratios. Future avenues of research will determine if the simulated detector is more efficient and effective at determination of xenon isotopes than present established benchmarks from real-world detector systems.

COMPARISON OF SEM IMAGES OF SAND FROM PERIGLACIAL TERRESTRIAL ANALOGS: IMPLICATIONS OF SIMILARITIES TO PHOENIX MARS LANDER LANDING SITE
Jessica Gibson, Lindsay Culp, Constantine Lecos
Category: Physical Sciences, Section 2
Poster: 349
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Michael Velbel (Geological Sciences)

The purpose of this project is to observe surface texture similarities between sand grains from different sites. We used data from the Phoenix Mars Lander mission, which landed on the “Green Valley” region near the north pole of Mars. The ground in this region contains many polygonal features that were presumably caused by freezing-related thermal contraction. The Phoenix Mars Lander was equipped with a robotic arm and camera, a surface stereo imager, a Thermal and Evolved Gas Analyzer (TEGA), and a Microscopy, Electrochemistry, and Conductivity Analyzer (MECA). We also used two sets of data from a terrestrial analog site, an area of patterned ground in the Saginaw Lowlands of Michigan. This region is covered with polygonal patterns that are interpreted as permafrost features. We obtained two sets of grain data from the soil near ice-wedge casts beneath the surface of these polygonal features. In observing SEM images of these grains, and comparing them with SEM images of grains in previous studies as published in journal articles, we found many different types of grain shapes and surface textures. We discovered many spherical grains as well as a few very elongated ones. We noticed some round and angular shapes, and most grain surfaces were rough and pitted. Most likely, chemical deposition caused these surface textures. Overall, these results from our analog system can be compared with the images taken by the Phoenix lander to determine whether Mars sand grains were transported and abraded by wind or mechanically abraded by flowing water.

A RADIO EMISSION ANALYSIS OF NOVA PUPPIS 1991 (V351 PUP)
Carolyn Wendeln
Category: Physical Sciences, Section 2
Poster: 350
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Laura Chomiuk (Physics-Astronomy)

Cataclysmic variables (CV) are defined as binary star systems in which one component is a CO or ONe white dwarf and the other is a Roche-lobe-filling star. Previous studies have predicted that the archival CV Nova Puppis 1991 (V351 Pup) is an oxygen-rich ONeMg novae. Radio emission data collected from the Very Large Array telescope (VLA) for V351 Pup has remained untouched since its discovery in 1991. Ongoing data reduction techniques to measure the flux density of V351 Pup have been applied to generate a radio light curve of V351 Pup. Comparisons between V351 Pup and theoretical models of novae will allow insight to the composition and classification of V351 Pup. V351 Pup is predicted to fall under the category of a high-mass white dwarf. Current hypothesis dictate that heavier white dwarfs have less massive explosions and therefore eject less material. Analysis of V351 Pup will give insight to the behavior of high-mass white dwarf novae.

ANALYSIS OF THE SCINTILLATING COSMIC RAY ELIMINATING ENSEMBLE (SUNSCREEN)
Emily Klopfer
Category: Physical Sciences, Section 2

Poster: 351
Location: Second Floor Concourse, 1:30 PM-3:30 PM
Mentor(s): Artemis Spyrou (Physics)

Naturally occurring, proton rich, isotopes that cannot be produced in the s- or r- processes are called p-nuclei. Their nucleosynthesis proceeds by the p-process; a process that is still not well understood. This process may be studied by measuring (p, γ) and (α,γ) reactions using the Summing NaI(TI) detector (SuN) created at NSCL. The SuN detector uses a summing technique where all the gamma rays emitted from a single compound nucleus are summed into one peak that can then be analyzed. One problem with this method is the background created by cosmic rays at high-energy regions of the gamma spectrum. To counteract this drawback a veto detector named SuNSCREEN (Scintillating Cosmic Ray Eliminating ENsemble) is being developed to reduce the cosmic ray background. The present work was focused on the characterization of SuNSCREEN using radioactive sources and room background events. The experimental results were compared to a full simulation of the setup using the software GEANT4.

PSYCHOLOGY

ORAL PRESENTATIONS, SECTION 1

INTEGRATING EYE-TRACKING WITH FUNCTIONAL MAGNETIC RESONANCE IMAGING IN A STUDY OF LITERARY ATTENTION
Shan Kothari
Category: Psychology, Section 1
Location: Room 50, 9:00 AM-9:15 AM
Mentor(s): Natalie Phillips (English)

Eye-tracking is one of the most commonly used technologies to study visual responses to complex stimuli, including literary texts. However, to this date, few research projects have exploited the capacity to combine eye-tracking technology with brain imaging to integrate visual and neurological data. In this presentation, we describe the integration of eye-tracking with functional magnetic resonance imaging (fMRI) in the context of an interdisciplinary experiment in which 18 Stanford literature PhD students read Chapter 2 of Jane Austen's Mansfield Park in an fMRI scanner. Using Python scripts to calibrate raw eye-tracking coordinates, we show how time-courses derived from eye-tracking can be used to create heat maps summarizing where subjects are looking. We also use these time-courses to determine the precise visual features of experimental stimuli that cause particular neurological changes. This research has the potential to enable neurological research into human responses to complex stimuli, and may help us understand such previously intractable mental phenomena as attention and textual comprehension.

THE IMPACT OF FEMINIST IDENTITY MANAGEMENT ON SELECTION FOR LEADERSHIP POSITIONS
Emily Pacic
Category: Psychology, Section 1
Location: Room 50, 9:15 AM-9:30 AM
Mentor(s): Ann Marie Ryan (Psychology)

Women who are feminists are stereotyped in ways that are unique to this identity, and often counter to the stereotypes associated with other women who do not identify as feminists. The purpose of this study is to examine the effect that identifying as a feminist would have on the likelihood of an applicant being hired for a leadership position. Feminists are stereotyped as being more assertive and more agentic than other women, and are often rated less positively then non-feminists (Twenge & Zucker, 1999). However, this agentic behavior can be seen as more positive in the workplace where such behavior is more in line with the expected role of a leader (Heilman, 2002). In this study, job candidates either identify as a feminist or not, which is denoted by changing the affiliations section of a resume. We also examine how gender composition of a field impacts the selection of a candidate, such that a field is a majority men, women, or has a mixed gender composition (having an equal number of men and women employees). Participants completed an online study in which they examined the resume of a single job applicant and then answer questions regarding hiring recommendation, applicant likability, and their overall assessment of feminists. Data analysis is taking place now and will be complete for the UURAF presentation. We hope that our research will inform research about the complex identity of a feminist leader in the workforce.

VOICE AND GENDER
Asia Souder, Emily Pacic
Category: Psychology, Section 1
Location: Room 50, 9:30 AM-9:45 AM
Mentor(s): Ann Marie Ryan (Psychology)

Gender is one of the most fundamental divisions within society, and daily interactions are often conceptualized through a

gendered lens (Gheradi, 1995; Whitehead, 2001).The gendered lens suggests that women are assigned more communal characteristics (e.g. being soft-spoken and nurturing), which often lead to workplace discrimination due to a perceived "lack of fit" within traditionally male-centered occupations (Burgess & Burgida, 1999). On the other hand, males are traditionally associated with characteristics such as strong, vocal and competitive. The current study seeks to clarify the assumed association of gender with voice behavior (i.e., the discretionary communication of work related ideas, suggestions, or opinions with the intent to improve organizational functioning; Morrison, 2011); because previous research has presented inconsistent findings (Detert & Burris, 2007; Young, 1978). This study examines employee voice behavior as a function of collective self-esteem (the positive or negative evaluations of one's social group(s), measured by four dimensions; Tajfel & Turner, 1986), as well as minority or majority status within an organization. Participants will include 250 undergraduate students. The procedure will entail exposure to fictitious company information, including gender composition and organizational gender views. Following exposure to this information, participants will response to questionnaires that assess their subsequent voice behavior and other individual characteristics. This research will examine how factors beyond gender category influence voicing behavior in the workplace.

EFFECTS OF GOAL ORIENTATION ON EMPLOYMENT OUTCOMES
Rikita Shah, Abdifatah Ali, Beau Fandrick
Category: Psychology, Section 1
Location: Room 50, 9:45 AM-10:00 AM
Mentor(s): Ann Marie Ryan (Psychology)

The successful transition from college to the workforce is an important step that could potentially have impact on career trajectory. It is important that we gain a better understanding of the job search process so that students can find a way to understand themselves better, and possibly be able improve their job search methods. Our study focuses on job search behaviors and patterns by examining the effects of goal orientations on self-efficacy as well as job outcomes. Graduating seniors seeking full time employment were recruited as participants to complete surveys about their job search experiences. Surveys were sent out on a 2-week interval at 8 time-points. Baseline survey measured various items along with goal orientation, while subsequent surveys measured constructs such as job search self-efficacy and employment outcomes. Preliminary data will be presented for this conference. Since goal orientation has been considered a predictor of motivation and performance in past studies, we are expecting to find that individual's approach orientations such as "learning" and "performance prove" will have more positive job outcomes compared to individual's with avoid orientations. Practical implications for student job seekers and research contribution will also be discussed.

BREAKING DOWN BARRIERS OF CRIMINAL RECORDS IN EMPLOYMENT THROUGH IDENTITY MANAGEMENT
Jenna Dean, Abdifatah Ali, Lizette Elgabalawi
Category: Psychology, Section 1
Location: Room 50, 10:00 AM-10:15 AM
Mentor(s): Ann Marie Ryan (Psychology)

This study focuses on how job seekers manage their identity once tainted by a criminal record. Specifically, we aim to find strategies that individuals with a criminal background can adopt to better manage their identity in the hiring process, in hopes that it maximizes their chances for employment. This study is of great importance because 30% of American adults have some sort of a criminal record, and employers are reluctant to hire such individuals although these restrictions are not aptly justified with empirical evidence. This research was conducted using online surveys in which participants took on the role of a hiring manager and then were asked to rate applicants who had various attributes one of which was their criminal background. We will be presenting our findings from a series of studies, and highlight the importance of our research in terms of its theoretical contribution as well as its practical relevance.

BEHAVIORAL REGULATION AND AGGRESSION IN KINDERGARTENERS
Lindsay Rye
Category: Psychology, Section 1
Location: Room 50, 10:15 AM-10:30 AM
Mentor(s): Kelly Mix (Counseling, Educational Psychology and Special Education)

This study explores the relation between gender, aggression, and behavioral regulation in kindergarteners. Previous research suggests a relation between higher levels of aggression and lower levels of behavioral regulation skills (Ellis, Weiss & Lochman, 2009; White, Jarrett & Ollendick, 2013). Additional data supports that females tend to show lower levels of aggression than males, but shows no significant relationship between gender and behavioral regulation (White, Jarrett & Ollendick, 2013). Similarly to Matthew, Morrison and Ponitz (2009) whose data supports the notion that females tend to perform higher than males on behavioral self-regulation tasks, this study seeks to examine the possibility of a relationship between gender and behavioral regulation skills as well as aggression. To examine this, the study will assess 50 kindergarteners. The participants will be administered the Head Toes Knees Shoulders (HTKS) task, and teachers will fill out a 6-item Reactive Proactive Aggression (RPA) scale for each student. The researchers expect to find that females will perform higher on the HTKS task, and will receive lower ratings of aggression than males. These findings would suggest that there is a

link between gender and behavioral regulation as well as gender and reactive aggression. The alternative to this would be that although females report with lower aggression levels, gender has no effect on scores of behavioral regulation. These findings would support those of White, Jarrett and Ollendick (2013), that although males tend to have higher levels of aggression, there seems to be no connection between gender and behavioral regulation skills.

TEST TAKERS' RESPONSES TO DIVERSE VIDEO-BASED SJTS: THE ROLE OF ATTITUDES AND BACKGROUND EXPERIENCES
Dominik Isham, Asia Souder
Category: Psychology, Section 1
Location: Room 50, 10:30 AM-10:45 AM
Mentor(s): Ann Marie Ryan (Psychology)

Situational judgment tests (SJTs) are made up of hypothetical work-related situations with a set of behavioral response options to pick from. SJTs are of great interest to practitioners because they can be a valid and fair method of assessing job applicants. Video-based SJTs, in particular, are seen as an attractive option because of their ability to better engage respondents. But video-based SJTs, unlike paper-and-pencil ones, present the challenge of figuring out whom to cast as actors. Previous research shows that respondents pay attention to the race of actors in an SJT and this can influence their test responses and reactions to the test. The current study extends this research by examining the role that respondents' attitudes and background experiences play in how they react to SJT actors' race. Participants watch four interpersonal situations between White and Black coworkers (actors) and indicate what they would do in the role of one of the coworkers. We expect that (due to historic inequalities between racial minority and majority groups and efforts to promote the treatment of all individuals in a "colorblind" manner) having to respond to the inter-racial interactions in the SJT is likely to trigger participants' concerns about the possibility of appearing prejudiced. We will examine how participants' attitudes and background experiences with diversity influence their effort on the SJT, actual responses to the situations, and reactions to the test as an organizational selection tool.

POSTER PRESENTATIONS, SECTION 1

THE EFFECT OF EXTRACURRICULAR INVOLVEMENT ON ACADEMIC PERFORMANCE AND ETHNIC IDENTITY
Xinyi Fang
Category: Psychology, Section 1
Poster: 355
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Chiharu Kato (Education)

The current study examines the role of extracurricular activities on students' attitude toward challenging test. It was hypothesized that those who participate in ethnic-related extracurricular activities will have high ethnic identity and higher motivation toward challenging test. The data for this study was collected as a part of a larger research project on stereotype susceptibility on female minority college students conducted at a midwestern state university. The sample size is 164 female college students (Asian and Hispanic), of those, data from 82 participants, who were asked about their participation to extracurricular activities, are used for this study. In this study, we chose to examine the Multigroup Ethnic Identity Measurement(Phinney, 1992) , their Attitude towards Learning measured by four items - how many extracurricular involvements, and what type of organizations they are in. Also, we measured the number of organizations as 0 = none, 1 = one organization, and 2 = two or more. The overall results did not support my hypotheses because participants involved more organizations or, minority-based groups did not show improved attitudes toward challenging math test ($r = .227$ and $r = .145$, respectively). However, there were some interesting trend emerged when we split our data by ethnicity. The implication of this study may be ethnic groups integrate extracurricular involvement and attitudes toward learning differently. Extracurricular involvement may not impact minorities' attitudes toward challenging test. Also, minorities may react to ethnic identity differently.

PHYSIOLOGICAL BIOMARKERS OF CHILD ANXIETY: THE RELATIONSHIP OF ERN AND STARTLE RESPONSE TO OCD, DISTRESS, AND FEAR DISORDERS IN CHILDREN AGED 3 TO 7
James Mooney
Category: Psychology, Section 1
Poster: 356
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Brent Donnellan (Psychology), C Emily Durbin (Psychology)

Early onset of anxiety disorders has shown to relate to more pervasive and debilitating symptoms over the life course. Young children often have difficulty verbalizing feelings of worry and anxiety. Thus, finding a way to identify those at high risk for future anxiety using physiological measures could potentially help those individuals' outcomes immensely. This study aims to do this that by looking for correlations between two specific psychophysiological markers, the error-related negativity (ERN) and fear-potentiated startle (FPS) responses, as well as parent reports of anxiety in children. 50 children aged 3-7 recruited from the greater Lansing area were brought into the lab on two separate occasions. On the fist visit, the child completed a

laboratory assessment of their temperament, including traits relevant to anxiety disorders (e.g., fear proneness). On the second visit, children completed two computerized tasks meant to measure processes relevant to anxiety, including the ERN and FPS. Parents completed questionnaire measures of their child's anxiety and related temperament traits. Preliminary analyses of these data have been consistent with similar studies in that high-anxiety children show a decreased ERN (a pattern distinct from that observed in studies of anxious adults), and an increased startle response (similar to findings observed in adults).

PARENTAL RELATIONSHIP QUALITY AS A PREDICTOR OF CHILD EMOTIONAL INTELLIGENCE
Maria Accavitti
Category: Psychology, Section 1
Poster: 357
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): C Emily Durbin (Psychology)

The term Emotional Intelligence (EI) describes a set of skills that begin to develop in early childhood, which includes abilities such as perception, understanding, and regulation of emotion in oneself and others. The development of these skills is crucial to an individual's successful navigation of the social world. Previous research has shown that in romantic couples, low levels of EI are related to lower levels of depth, support, and positive relationship quality. (Brackett, Warner and Bosco, 2005) Children of parents with poor relationship quality may be exposed to higher levels of conflict and negative emotionality, which have the potential to adversely affect their emotional development. This study will explore the relationship between parent relationship quality and child emotional intelligence in a sample of participants from the Child Emotions Lab at Michigan State University. Scores for EI will be calculated by each child's ability to label and regulate their emotions in response to a battery of lab tasks; relationship quality will be determined by biological parents' scores on two self-report questionnaires: the Dyadic Adjustment Scale and the Marital Satisfaction Inventory. Pearson's r will be used to search for correlates across several dimensions of each construct, and it is expected that the children of parents who report poorer relationship quality will score lower in emotional intelligence.

TREATING PREJUDICE
Ryan Lang
Category: Psychology, Section 1
Poster: 358
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Brent Donnellan (Psychology)

Is in vivo exposure therapy a useful tool for reducing prejudice? This research examines whether intergroup anxiety can be reduced beyond the effects related to using positive imaginal exposures involving a contact situation between participants and stigmatized out-groups. This is an important area of research because it deals with a simple and easily deployable method for reducing intergroup anxiety. It is critical to attempt to reduce intergroup anxiety since it often causes discomfort to individuals experiencing it and can lead to social injustice in the extreme form. This research attempts to determine if using a negative in vivo exposure before using a positive in vivo exposure in the treatment of intergroup anxiety would leave a more tangible benefit to participants than using positive in vivo exposures only. Participants were recruited from the Michigan State University psychology participant pool to complete an online experiment. The study gathered responses from 394 non-black students. The central prediction was that participants in the Negative then Positive exposure condition would score lower on measures of negative reactions to the stigmatized group (Black Males) at the end of the therapy compared to participants in the Positive exposure only condition. No support for this prediction was found. These findings will be examined, potential explanations for the results will be discussed, and recommendations for future research in this area will be given.

EFFECTS OF AN ASTRONAUT EXERGAME ON MOTIVATION
Erin Sterk, Pamudu Dissanayake, Hannah Pilarski
Category: Psychology, Section 1
Poster: 359
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Alison Ede (Kinesiology)

Purpose: In efforts to maintain aerobic and musculoskeletal health during space missions, the National Space Biomedical Research institute has funded a project to create an exergame to increase astronauts' exercise motivation while in space. A pilot study will be conducted to test the protocol for the future longitudinal study. The purpose of this study is to compare the trends of subjective measures (i.e., ratings of perceived exertion) with objective measures (i.e., heart rate) of exertion levels when exercising with a software generated partner over six exercise sessions. Our hypotheses are: 1) the subject's RPE and actual effort will linearly increase with each subsequent session, and 2) perceived and actual effort will be similar to one another throughout the duration of the study. Methods: Male and female (n = 10) university students will first complete a graded exercise test using a cycle ergometer to determine max heart rate, then they will complete six non- consecutive

exercise sessions where they will perform continuous, stationary biking over a 30 minute period to retain an exertion level of 75% of their VO2max. RPE, HR, and exertion values (watts) will be collected and graphically represented to illustrate correlations. The information gained from the pilot study will be used to refine the exergame for use in future experiments within the larger project.

THE EFFECTS OF CUE POTENTIATED FEEDING ON THE OVEREATING BEHAVIOR IN RATS
Jessica Kessler
Category: Psychology, Section 1
Poster: 360
Location: Lake Huron Room, 9:30-11:30
Mentor(s): Alex Johnson (Psychology)

Past studies have found that things like the McDonald's Golden Arches can affect the eating behaviors of people who are not hungry. The focus of this study is to more closely examine this phenomenon by seeing the effects that different learned cues can have on the overeating behavior in already satiated rats. Such a study allows for a greater understanding of such behavior in humans, especially in relation to helping with obesity. As mentioned, things like fast-food symbols act as a cue like the ones being taught to the rats, so having a better understanding of the interaction between such cues and overeating behavior could give important insights as to how to better counteract the problems caused by such interactions. In this experiment rats that had been put on decreased food were given particular cues (white noise vs. click) paired with rewards that were either hedonically pleasing (example: surgery flavor) or satiating. Once training for the cues was completed, the rats were given as much food as they could eat so that they would later be completely full. The full rats were then tested through timed trials in which they were given uninhibited access to either the hedonically pleasing or the satiating reward and then were presented with the cues learned from training. Analysis of the results shows that the learned cues did in fact cause the satiated rats to overeat when the cues were presented.

IS A CHANGE MORE DETECTABLE IF IT CAN BE PREDICTED?
Monique Daignault
Category: Psychology, Section 1
Poster: 361
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Mark Becker (Psychology), J Devin McAuley (Psychology)

Previous studies have found that knowing when something is going to happen can improve the detection of it. Additionally, the ability to detect a change was shown to increase in a "mud splash" paradigm in which black figures flashed repeatedly at a regular rhythm before flashing simultaneously with a change (Becker and Vera, 2007). Detection of the change with the rhythmic series of flashes was much better than without the flashes. We hypothesized that the flashes were used to predict the change that occurred with the last flash. The current study uses a similar paradigm to Becker and Vera (2007). Participants view a circle of letters and are asked to detect a change in one of the letters with and without a preceding rhythmic series of flashes. Our first Experiment, presented last year at UURAF, showed that changes that occurred in-sync with the preceding rhythm were as detectable as changes that occurred out of sync with the preceding flash rhythm. In Experiment 2, beeps were added to the preceding rhythm to better induce expectancy and the results were similar to Experiment 1. Experiment 3 addresses if blocking in-sync trials together would make the change in each trial more predictable. Experiment 4 explores the relative gain a regular preceding rhythm may have compared to an unpredictable irregular rhythm. The results of this ongoing study may show that knowing when a change will occur is not as helpful as one would think.

THE EFFECT OF TEMPO AND DISTAL PROSODY ON WORD LEARNING IN AN ARTIFICIAL LANGUAGE
Patrycja Zdziarska
Category: Psychology, Section 1
Poster: 362
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Laura Dilley (Communicative Sciences and Disorders), J Devin McAuley (Psychology), Tuuli Morrill (Psychology)

How do listeners segment words from fluent speech? Research shows that general principles of auditory perceptual organization play a role in word segmentation in an unfamiliar language. In a previous experiment, listeners were exposed to syllable sequences in an artificial language in which embedded syllable pairs could be grouped as congruent or incongruent with the distal prosodic pattern of pitch and duration that was established at the beginning of the sequence. After exposure, listeners judged whether test syllable pairs were words or non-words in the artificial language. Results indicated that the prosodic patterning established at the beginning of the syllable sequence influenced downstream grouping of syllables into words: syllable pairs heard as congruent with the prosodic patterning were judged as more likely to be words than incongruent syllable pairs. In the present study, the tempo of syllable sequences was increased to test whether grouping of syllables would be more salient at a faster speech rate. The magnitude of the effect of distal prosody on word learning did

not change with increased tempo. Findings provide further evidence that distal prosody affects learning of novel words in an artificial language, and suggest that the effect is not dependent on speech rate.

POSTER PRESENTATIONS, SECTION 2

EARLY TEMPERAMENTAL CORRELATES OF RISK FOR SUBSTANCE USE DISORDERS
Jenna Dakroub
Category: Psychology, Section 2
Poster: 364
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): C Emily Durbin (Psychology)

Objective: This study examined the relationship between child temperament traits and indicators of their risk for future substance abuse in a community sample of families with children aged 3 to 7 years. Our main indicator of children's risk for substance abuse was familial history of these disorders, assessed through direct psychiatric interviews with the children's biological mothers and fathers. Child traits were measured using a battery of structured emotion eliciting laboratory tasks and parent report questionnaires. We predicted that traits related to impulsivity, attentional control, and sensation seeking would be positively correlated with familial history of substance use disorders in mothers and fathers. We tested these questions by comparing children with low and high levels of familial risk for substance use disorders on lab-assessed traits (activity, impulsivity, positive emotionality, attentional control) and parent-reported traits (impulsivity, inhibitory control, activity, high intensity pleasure). We also tested whether these effects varied depending upon whether the disorder was present in the child's mother or father, or across type of substance use disorder (alcohol versus drug).

PARTNER AND ENVIRONMENT CHARACTERISTICS: PREFERENCES IN AN EXERGAME DESIGNED TO ENHANCE MOTIVATION
Christopher Ribaudo, Meghan Bade
Category: Psychology, Section 2
Poster: 365
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Alison Ede (Kinesiology), Deborah Feltz (Kinesiology)

Purpose: The purpose of this study, funded by NSBRI, was to determine the ideal features to be used in a virtual exercise game (exergame) designed to increase motivation and exercise performance. Focus group sessions were conducted to collect qualitative data from participants regarding factors such as: the appearance of software generated (SG) partners, the appearance of the exergame interface, and the interaction between participants and their SG partners. Procedure: Two focus group sessions were held, one with 2 male and one with 2 female participants prior to the larger experiment. Participants were current or former competitive athletes, regular exercisers, and over the age of 35. In the focus group sessions, participants were asked questions about specific desired characteristics of an exergame experience. Results: Both male and female participants desired a virtual partner who appeared to be fit but not overly muscular and were dressed age-appropriately. Females preferred partners who had muscle tone yet remained feminine while males indicated they wanted a partner who was both a peer and in appropriate shape for the task. Both males and females wanted the option of choosing their SG partner. Males focused on choosing a partner based on the specific workout while females focused on gender, ethnicity, and age. Lastly, in terms of the game interface, both genders preferred realistic scenery that matched the task to be completed (i.e. for a long, continuous bike ride participants preferred outdoor scenery and sounds vs. a track or velodrome simulation for interval training cycling).

TWITTER AND FALSE MEMORY: FAMILIARITY OF NEW INFORMATION REDUCES FALSE MEMORY FROM TWITTER
Nicholas Griffin, Cory Fleck, Katie Sadler
Category: Psychology, Section 2
Poster: 366
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Kimberly Fenn (Psychology)

Social media websites contain information that does not require verification, and therefore have the potential to provide incorrect information to users. Furthermore, false information encountered after an original event can contribute to memory distortion (Loftus, 2005). We investigated how false information from the social media website Twitter affected memory distortion. In the first experiment, we found that false memory was reduced when misinformation was presented in a Twitter feed compared to a format not resembling social media. In the second experiment, we further explored how two factors might contribute to reduced false memory from Twitter: familiarity with studied information and relationship to individuals who posted information on Twitter. MSU students read an article about either MSU or the University of Iowa and viewed a Twitter recap of the article containing false information. Half of the participants who read each story viewed tweets purportedly written by MSU students and the other half viewed tweets purportedly written by Iowa students. Participants completed a recognition memory test and a source test. Correct and false recognition were similar across conditions.

However, participants who read the Iowa article were more likely to incorrectly report that false information was from the original article than participants who read the MSU article. These results suggest that the medium of presentation can affect the way individuals approach information and can reduce false memory. Furthermore, individuals may be more vulnerable to memory distortion when new information is unfamiliar. Thus, familiarity with information may help prevent memory distortion.

SURVIVAL PROCESSING ADVANTAGE AND MEMORY
Stephen Buskirk, Hannah Reed
Category: Psychology, Section 2
Poster: 367
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Kimberly Fenn (Psychology)

If memory has been shaped by the process of evolution, then information that is relevant to survival should be more strongly encoded in memory. Consistent with this, information that is processed for survival shows stronger memory retention than information not processed for survival (the "survival processing advantage", Nairne, et al., 2007). The present study was designed to replicate and extend research on the survival advantage by testing the advantage after a 48-hour delay. Participants were given nouns and rated the relevance of each word in either a survival-based or control-based scenario. In the survival scenario, participants were instructed to imagine that they were stranded on a grassland and had to survive for a few months. In the non-survival control, participants were told to imagine that they were on a vacation. Either immediately or 48-hours later, participants were given a free-recall test. We found that in both delay conditions, the survival group showed higher correct recall and lower false recall than control. These results suggest that the survival processing advantage is not simply an immediate or transient effect, but persists for at least two days. This allows us to better understand long term retention of information and why our memory system allows for long term memory formation. If our memory system was tuned by processes of natural selection to be selective for survival-relevant information then this information should persist over long periods of time.

THE EFFECTS OF SLEEP ON EYEWITNESS MEMORY
Taylor Dehnke, Matthew Waldrop
Category: Psychology, Section 2
Poster: 368
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Kimberly Fenn (Psychology)

The legal system in the United States yields an alarming number of wrongful convictions. A recent examination found that mistaken eyewitness testimony is the leading cause of wrongful convictions (Garret, 2011). Research has found several factors that can improve the accuracy of eyewitness identification (Wells & Olson, 2003). For example, when the potential perpetrators are presented sequentially (i.e. one at a time), there are fewer false identifications of innocent individuals than when simultaneous presentation is used (Lindsay & Wells, 1985). Despite the growing literature on eyewitness memory, one factor that has been neglected among this research is sleep. Sleep strengthens declarative memory, reduces false memory, and protects memory from interference. In the present study, we investigated the effect of sleep on eyewitness memory. Participants viewed a brief video of a staged crime and were later given a series of six photos and were asked to identify the perpetrator of the crime. Half of the participants completed the identification test shortly after witnessing the crime (the control group) and half of the participants were tested after a 12-hour retention interval that either spanned a waking day or a night of sleep. Data collection is ongoing. We predict that after a period of sleep, participants will be better able to correctly identify the perpetrator and will be less likely to make a false identification. If the data supports these predictions, this may imply that eyewitnesses will show better accuracy if they are asked to identify the perpetrator after a period of sleep.

FEMALE MICE EXHIBIT SNB CELL MASCULINIZATION WHEN EXPOSED TO TESTOSTERONE IN EARLY CRITICAL PERIODS
Emma Spatz
Category: Psychology, Section 2
Poster: 369
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Marc Breedlove (Neuroscience)

Neurons of the spinal nucleus of the bulbocavernosus (SNB) are characteristic of males, as they express androgen receptors and send their innervation to the striated penile muscles that control male-typical mating behaviors. It has been observed in rats that there are critical periods of development during which testosterone administration to females can promote SNB masculinization. Further, it is known that SNB cell size masculinization occurs in a window that extends beyond the critical period for cell number masculinization. This experiment aimed to test if critical periods of development exist in mice, as they do in rats. This is an important question to answer as genetic manipulations have made mouse models very useful for studying development. Four groups of female mice were exposed to either prenatal, early postnatal, late postnatal

testosterone or no testosterone at all. Of the four groups, half of the animals received testosterone capsules in adulthood (8 total experimental groups). Once mature, mice were sacrificed, perfused and their spinal cords were sectioned and thionine stained. SNB cells were then counted and the cell and nuclear sizes were measured using computer software. When combined with adult testosterone capsules, the early postnatal group expressed larger SNB cell size. Overall, adult testosterone treatment increased SNB cell and nucleus size in each group independent of perinatal treatment. In addition, this experiment supported rat results that claimed there are different sensitive periods for SNB masculinization. This information concludes that mice may be a suitable substitute for rats when studying critical periods of development.

THE EFFECT OF DECISION-MAKING ON FALSE MEMORY
David Smith, Joseph O'Conner, Sarav Shah
Category: Psychology, Section 2
Poster: 370
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): Kimberly Fenn (Psychology)

Past research has found that working memory capabilities positively correlates with decision-making ability (Missier et al., 2013). However, the role that decision-making may have on memory has remained unexplored. We examined the effects of decision-making on veridical and false memory. Participants were shown ten semantically-related word lists, designed to elicit false memory. Half of the participants were able to choose between two lists with different descriptions. For example, one list was labeled as "More relatable to Democrats" and the other list was labeled "More relatable to Republicans". The other half of participants were not permitted to choose. After a distractor task, participants completed a recognition memory test where words were individually presented and participants decided whether or not they had seen the word in the lists. We expected that participants who were able to choose would show higher correct recognition and lower false recognition compared to participants who were not. These predictions were based on prior research that found that decision-making increased attention and decreased false memory (Cowan, 1988). Participants who were permitted to choose their lists should pay more attention and show less false memory and higher correct memory. Data collection is ongoing but if we obtain the expected result, it would show that the ability to make a decision causes a person to not only have higher memory, but also less false memory. These results would imply that memory is greater when a person can decide what to learn and that decision-making changes how we store information.

THE RELATION OF RHYTHM ABILITY TO PHONOLOGICAL AWARENESS AND GRAMMAR SKILLS IN CHILDREN
Karli Nave, Katie Centurione
Category: Psychology, Section 2
Poster: 371
Location: Lake Huron Room, 9:30 AM-11:30 AM
Mentor(s): J Devin McAuley (Psychology)

Several studies have investigated the relation between music cognition and language processing. Overall, it is agreed that musical experience is related to language, but the specific connections between music experience and different aspects of language ability are not fully understood. Recently several studies involving children have looked at both grammar skills and phonological awareness in connection to musical ability. While many studies offer evidence that grammar skills and musical ability are correlated throughout development, a recent study using 6-year-olds found that the correlation between phonological awareness and rhythmic ability was much weaker (Gordon et al, in revision) . In the current experiment, we investigate rhythmic ability and the relation to both grammar skills and phonological awareness in children. It is hypothesized that as children acquire phonological awareness, they rely on rhythm to parse out the sounds they hear that make up the words within their language. In order to investigate this, children complete a rhythm discrimination task, as well as measures of grammar skills, phonological awareness, and IQ. Children at younger ages who show high phonological awareness are expected to also have good rhythmic ability, resulting in higher correlations between rhythmic ability and phonological awareness in the younger children (4-5 years old) compared to the older children (6-7 years old). Results elucidate whether or not rhythm ability is indeed predictive of phonological awareness in young children.

POSTER PRESENTATIONS, SECTION 3

DOES ADDRESSING A STEREOTYPE HELP OR HARM AN INTERVIEWEE?
Dominik Isham, Beau Fandrick, Rikita Shah, Asia Souder
Category: Psychology, Section 3
Poster: 374
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Ann Marie Ryan (Psychology)

Employment interviews are the most popular procedures used in the selection process (Dipboye, 1992;Schmidt & Rader, 1999), understanding how evaluators react to job candidates' identity management strategies could have meaningful implications for informing training of hiring managers as well as for advising job seekers. Job candidates who belong to a

negatively stereotyped group generally receive lower evaluations in the selection process than those in more positively stereotyped groups (e.g., Bertrand & Mullainathan, 2004; De Beijl, 2000; Garcia-Retameo & Lopez-Zafra, 2006). Applicants have the choice of talking about a positive stereotype associated with their social category membership, challenging a negative stereotype or not addressing stereotypes at all. To examine the effects of these strategies on hiring decisions, we conducted an experiment in which participants read about a fictitious group living in the U.S. called the "Yoslins." After viewing the article, participants received an interview excerpt in which a member of the Yoslin group responds to interview questions utilizing identity management strategies that either addresses or ignores their positive/negative group stereotype. Findings on the effects of these differing identity management strategies will be presented.

THE EFFECTS OF APATHY ON WHITE MATTER INTEGRITY IN MILD COGNITIVE IMPAIRMENT
Cort Thompson
Category: Psychology, Section 3
Poster: 375
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Andrea Bozoki (Neurology), Ashley Hannah (Neuroscience)

Mild Cognitive Impairment (MCI) is the transitional state between normal aging and dementia. Individuals with MCI show an approximate 10 % conversion rate per year to Alzheimer's disease (AD). Neuropsychiatric symptoms (NPS) that exist within MCI can predict an increased likelihood of transitioning to AD. Apathy is the most common NPS in MCI and AD dementia. It's been found that apathetic MCI subjects have a greater risk of developing dementia than MCI individuals without apathy. In addition apathy has been shown to decrease the structural integrity of grey and white matter in the brain. The goal of this research is to examine the differences in white matter integrity (WMI) between two groups of MCI subjects; subjects with and without apathy. A pool of 20 MCI subjects, age 55 and older with Diffusion Tensor Imaging (DTI) data will be examined. The presence of apathy will be quantified using the Neuropsychiatric Inventory Questionnaire (NPIQ). DTI will be used to examine brain WMI by measuring the fractional anisotropy (FA) or diffusion of water along an axon. FA is a scalar measure (0-1) with one indicating normal diffusion. DTI data will be processed using the fMRIB's Software Library's (FSL) program and tract based spatial statistics program (TBSS) will be used to compare whole brain FA values between groups. Finally, brain regions of interest will include the bilateral striatal structures and left anterior cingulate cortex. In summary, this study will examine the affect of apathy on the WMI of MCI subjects.

THE EFFECT OF EMOTIONAL VALENCE ON FALSE MEMORY
Ashley Gorman, Chelsea Johnson
Category: Psychology, Section 3
Poster: 376
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Kimberly Fenn (Psychology)

The strength of a memory depends on several factors. One factor that has consistently shown to affect memory is emotional valence; memory for negative information is typically higher than memory for positive information. This suggests a cognitive bias for negative information (called the negativity bias) (Rozin et al. 2001). Although the effect of this negativity bias on correct memory is widespread, there is only one study that found higher false memory for negative information that was related to studied material (Brainerd et al. 2008). We investigated how the bias for negative information could influence false memory for negative material that was unrelated to studied information. Participants viewed positive and negative emotionally-valenced word lists. Each list was composed of semantically-related words, but the highest associate was not studied (the "critical lure"). Participants were later given a recognition memory test composed of studied words, critical lures from studied lists, and unrelated words from unstudied lists (half positive, half negative). For half of the participants, the test was administered immediately following the study phase and the other half was tested after a 24-hour delay. We found that participants correctly recognized more items from negative lists and falsely recognized more critical lures from negative studied lists. Interestingly, participants also showed higher false recognition for unrelated items that were negative. This suggests that the negativity bias may be extensive and can lead to false memory of negative information even if it is unrelated to the studied material.

THE ROLE OF BASIC AUDITORY AND COGNITIVE ABILITIES IN PIANO SIGHT-READING PROFICIENCY
Joshua Lucksom, Joshua Linkowski, Bradley Seegert
Category: Psychology, Section 3
Poster: 377
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Zach Hambrick (Psychology), J Devin McAuley (Psychology)

Expert-level musical performance has been argued to be the product of deliberate practice, defined by Ericsson and colleagues (2007) as engagement in activities specifically designed to improve performance in a domain. However, a recent study has shown that deliberate practice may not be sufficient to explain individual differences in expertise (Meinz & Hambrick, 2010); rather, working memory capacity, a basic ability that has been shown to be both stable and heritable,

accounts for a significant amount of the variance in musical performance, even for those with extensive amounts of deliberate practice. The present study aims to clarify the role of both musical and cognitive abilities in sight-reading proficiency. Over the course of two days, participants were tested via a range of cognitive ability, musical aptitude, and auditory processing tests. They also sight-read six piano pieces and answered surveys on the amount of deliberate practice and musical training they had undergone. Following from the earlier findings of Meinz & Hambrick (2010), we hypothesize that individual differences in both working memory capacity and auditory capabilities will predict individual differences in sight-reading proficiency, above and beyond deliberate practice.

DOES CREATIVITY IN ONE DOMAIN PRIME CREATIVITY IN ANOTHER?
Jonathon Walters
Category: Psychology, Section 3
Poster: 378
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jeremy Gray (Psychology), Petr Janata (Psychology), J Devin McAuley (Psychology)

Creativity is thought to possess both domain-specificity and domain-generality (Plucker & Beghetto, 2004), yet the nature of these scopes remains poorly understood. This study tested whether the creative generation of musical rhythms can prime the creative generation of word associations. To examine priming effects, rhythm generation trials were sequentially paired with verb generation trials. In the rhythm generation trials, participants heard a Simple or Complex rhythm (possessing, respectively, a more or less salient beat), and then tapped either the rhythm that was just heard (Repeat condition) or something new (Create condition). In the verb generation trials, participants saw a noun on the computer screen and were asked to say out loud a related verb. For each noun-verb pair, the semantic distance between the noun and verb was quantified using Latent Semantic Analysis (LSA) (Landauer et al, 1998). Previous research has shown that, when explicitly cued in the verb generation task to be creative, semantic distance values of noun-verb pairs significantly increased, and this increase was predictive of a general creativity factor in individuals (Prabhakaran et al, 2013). The current study used the same semantic distance measure (LSA) to examine the priming effect of tapping type (Repeat or Create) and rhythm type (Simple or Complex) on subsequent verb creativity. Semantic distance values of noun-verb pairs were predicted to be higher when preceded by the Create condition than by the Repeat condition. Discussed herein, such an effect may be explained by procedural priming of domain-general creative processes (Förster, 2012).

TIME COURSE CHARACTERIZATION OF OREXIN AND MELANIN CONCENTRATION HORMONE (MCH) EXPRESSION IN A DIURNAL RODENT MODEL OF SAD
Widya Adidharma
Category: Psychology, Section 3
Poster: 379
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Lily Yan (Psychology)

Seasonal affective disorder (SAD) is a major depressive disorder caused by a reduction of environmental lighting. Though circadian and monoaminergic systems have been implicated in the etiology of SAD, the underlying neural pathways through which light regulates mood are not well understood. To identify the neural substrates associated with light-dependent changes in mood, we have developed the diurnal grass rat, *Arvicanthis niloticus*, as an animal model of SAD. By utilizing a 12:12hr Dim Light:Dark (DimLD) paradigm that mimics winter's lower light intensity, animals housed in DimLD showed increased depression-like behaviors compared to animals housed in bright light during the day (BLD). Using the grass rat model of SAD, my present work tests a novel hypothesis that the hypothalamic neurons expressing orexin (OX) and melanin-concentrating hormones (MCH) are involved in mediating the effects of light on mood regulation. The time course of OX and MCH expression was characterized in grass rats housed in DimLD or BLD using immunohistochemistry. The immunoreactivity (ir) of OX and MCH was analyzed in serial sections containing the hypothalamus by counting the OX-ir or MCH-ir cells. The preliminary results show a reduction in the number of OX-ir cells in DimLD group compared to the BLD group, suggesting that the orexinergic pathway plays a role in light-dependent mood fluctuation and in the beneficial effects of light.

REVERSIBLE INACTIVATION OF RAT MEDIAL PREFRONTAL CORTEX (MPFC) IMPAIRS MOTOR PREPARATION
Dylan Miller
Category: Psychology, Section 3
Poster: 380
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Karim Oweiss (Electrical and Computer Engineering)

Long has humanity been plagued by an array of motor disorders and dysfunctions, with some genetic like amyotrophic lateral sclerosis (ALS) and others brought upon by incident, as in motor capability loss following a stroke. In spite of advancing medical treatments and growing scientific knowledge, the means by which the brain prepares a motor plan, initiates the movement and executes the voluntary motion is still poorly understood. Prefrontal cortex (PFC) has long been suggested to play a key role in preparation and execution of such voluntary behavior. Testing this will entail training rats on a

task requiring a delayed instructed motor task. GABA agonist muscimol was infused unilaterally through an implanted cannula to induce a reversible inactivation of the prelimbic area of rat's mPFC. We observed drug-volume dependent changes in the performance of the motor task only on the trials that the subjects were instructed to move towards a target contralateral to the infusion site. Changes were also observed in the reaction time suggesting impairment in the process of motor planning. These results propose an interesting role for the prefrontal cortex during motor planning, initiation and execution and open a venue for future studies to investigate the cellular mechanisms of prefrontal engagement in goal-directed behavior.

THE EFFECTS OF SHORT-TERM B-VITAMIN SUPPLEMENTATION ON MEMORY AND ATTENTION
Rudra Joshi
Category: Psychology, Section 3
Poster: 381
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Kimberly Fenn (Psychology)

Research has shown that long-term B-vitamin supplementation may improve memory and cognitive function in older and cognitively impaired populations. Furthermore, studies on younger individuals show improvement in memory recall and recognition with long-term B-vitamin supplementation. One limitation of this line of work is that it primarily focuses on long-term supplementation and the effects of short-term supplementation remain unexplored. We investigated the effects of short-term B-vitamin supplementation through immediate testing after a single dose. We employed a double-blind design in which participants received either a B-vitamin complex or vitamin C (control) supplement immediately prior to a series of cognitive tasks. All participants completed two sessions: one in which they received a B-vitamin complex pill and another in which they received the vitamin C pill (counterbalanced). During testing, participants completed mood and affect questionnaires, several memory tasks, and a task to measure the function of the attentional networks. In our results, we found a strong trend for improved function in the alerting attentional network, which helps achieve and maintain an alert state, with B-vitamin supplementation compared to vitamin C supplementation. Not surprisingly, after completing these demanding tasks, participants reported an increase in negative affect. However, this effect only occurred with vitamin C supplementation. When participants were given the B-vitamin, they did not report an increase in negative affect. These results suggest that short-term B-vitamin supplementation helps maintain an alert state and prevents an increase in negative affect, making it a useful supplement for demanding tasks such as studying.

POSTER PRESENTATIONS, SECTION 4

30 DAYS: INVESTIGATING THE SOCIAL AND PSYCHOLOGICAL IMPLICATIONS OF CYSTIC FIBROSIS
Megan Kechner
Category: Psychology, Section 4
Poster: 383
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Douglas Luckie (Physiology)

We investigated the social and psychological implications of cystic fibrosis by wearing surgical masks to simulate interacting with society when seen as someone with a visible, seemingly contagious disease. We wanted to determine whether wearing a mask in social settings increases the amount of time it takes for someone to sit within zone of inhibition and increases anxiety levels. One control without wearing a mask and two experimental trials while wearing a mask were performed in three locations. Times and anxiety scores were analyzed with t-tests. Experimental trials while wearing the mask yielded significantly ($p<0.05$) longer time intervals for the zone of inhibition to be entered in two locations as well as significantly ($p<0.05$) higher Beck anxiety scores in all three locations when compared to control, unmasked trials. The hypothesis that visible symptoms of cystic fibrosis would be socially avoided and increase anxiety levels was supported.

INVESTIGATING THE EFFECT OF CHRONIC SOCIAL STRESS ON MORPHINE REWARD AND THE ROLE OF THE VENTRAL TEGMENTAL AREA
Megan Kechner
Category: Psychology, Section 4
Poster: 384
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Michelle Mazei-Robison (Physiology & Neuroscience)

There is a significant overlap between patients suffering from depression and substance abuse, two of the most commonly diagnosed psychiatric disorders in the US. This co-morbidity calls for a comprehensive approach for studying the underlying causes of both conditions. To address this issue, I utilized chronic social defeat stress to preclinically model depressive-like behavior in mice. In this model, a small male mouse was allowed to physically interact in a larger aggressive mouse's home cage compartment for five minutes, after which they were physically separated by a perforated Plexiglas partition. This process was repeated for ten consecutive days, with introduction to a new aggressor's cage each day. After the last defeat

episode, a social interaction test was performed in which we measured the time the small mouse spent in an interaction zone when a novel mouse was absent or present. While control mice spent more time interacting, mice that were susceptible to the stress spent less time interacting, indicating a depressive phenotype. We combined this social defeat stress protocol with a paradigm to examine voluntary intake of opiates. I completed a two-bottle choice paradigm in which mice were singly housed with access to two-bottles, one of which contained morphine. I was able to establish a concentration of morphine (0.3 mg/ml) that produces an ~70% preference for morphine. There is a significant negative correlation between social interaction score and morphine consumption: "depressed" mice that exhibit more social avoidance consume more morphine, consistent with our hypothesis.

SEX DIFFERENCES IN PUBERTALLY ADDED CELLS IN THE RAT PREFRONTAL CORTEX AND NUCLEUS ACCUMBENS
Susie Sonnenschein
Category: Psychology, Section 4
Poster: 385
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Cheryl Sisk (Psychology)

Adolescence is a time of physical, cognitive, emotional, and social maturation, with concomitant remodeling of the brain. This remodeling is associated with the emergence of both structural and functional sexual dimorphisms within the brain. The medial prefrontal cortex (mPFC) and nucleus acccumbens (NAcc) are two brain regions involved in motivated behavior, and may play a role in why males show more risk-taking behavior than females, particularly during puberty. Sixty male and female rats were used to investigate whether there are sex differences in cell proliferation and/or survival during puberty in these regions. They received 3 injections of the cell birth-date marker bromo-deoxyuridine (BrdU; 200 mg/kg ip) on P30, and were sacrificed either 2d, 4d, 7d, 10d, 14d, 21d, or 42d following the injection. The number of BrdU-immunoreactive (Brdu-ir) cells was quantified in the cingulate gyrus (dorsal mPFC), prelimbic and infralimbic regions of the mPFC, and the core (NAcCore) and shell (NAcShell) of the NAcc. Preliminary results showed that, in each region, the number of BrdU-ir cells increased and then decreased over the course of puberty. The prelimbic mPFC and NAcCore showed a main effect of sex, with more BrdU-labeled cells in males than in females. The data suggests a structural sex difference exists in cells added during puberty, and if pubertal hormones are involved in maintaining that difference, then it's possible that pubertal hormones also play a role in sex differences in the behaviors associated with those areas.

INCREASING NEGATIVE EMOTIONS IN PSYCHOPATHIC UNDERGRADUATES: AN ELECTROPHYSIOLOGICAL INVESTIGATION
Jennifer Ellis, Hans Schroder
Category: Psychology, Section 4
Poster: 386
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Jason Moser (Psychology)

Blunted responding to emotional stimuli is a core feature of psychopathy and is viewed as an impediment to recovery. However, few studies have examined the capability that individuals with psychopathy have to modulate their emotions. Participants (N=39) were pre-screened, and those who scored high and low on the "boldness" subscale of Patrick's (2010) Triarchic Conceptualization of Psychopathy (Tri-PM) were invited to participate. We recorded event-related brain potentials (ERPs) to capture neural markers of emotional processing while participants completed two blocks of trials in which they were exposed to emotionally-unsettling and emotionally-neutral photos. Participants were asked to increase or decrease their negative emotions in a self-focused way, and to respond naturally to neutral and negative images. Participants were then given questionnaires, including an assessment which asked how they regulated their emotions during the task. ERP analyses focused on the late positive potential (LPP), an ERP associated with emotion processing. Individuals with psychopathic traits showed a blunted LPP to negative images. However, these individuals demonstrated an enhanced LPP amplitude when asked to increase their negative emotions, and reported experiencing an increased emotional reaction in trials where they were asked to increase their negative emotions, relative to controls. The current study replicated previous findings in which individuals with psychopathic traits demonstrated blunted emotional responses. More importantly, the results extend previous work by demonstrating neural and self-report evidence that these individuals can increase their negative emotions when instructed to do so.

SEASONAL AFFECTIVE DISORDER: PIECES OF THE PUZZLE
Andrew Schmidt
Category: Psychology, Section 4
Poster: 387
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Lily Yan (Psychology)

Seasonal affective disorder is a mood disorder brought on by a lack of exposure to sunlight. African Grass rats were exposed to different lighting conditions as well as an antagonist of orexin, a neuropeptide found in the brain that is associated with

wakefulness and eating. The brains were then stained using immunocytochemistry to highlight tyrosine hydroxylase (TH), an enzyme important in the production of dopamine, a neurotransmitter highly implicated in emotional well-being and motivation. Animals in lower light conditions were found to have less TH than those in brighter conditions. TH was also lower in the orexin antagonist animals. This provides evidence for both dopamine and orexin's role in the presentation of seasonal affective disorder.

CHILD EMOTIONS AND BEHAVIORAL TENDENCIES
Gabrielle Barringer
Category: Psychology, Section 4
Poster: 388
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): C Emily Durbin (Psychology)

Early childhood is a period characterized by increasing risk for behavioral problems. Various theories have proposed that the development of behavior problems is associated with children's temperamental traits, particularly traits related to children's intensity of experiencing negative and positive emotions and their ability to regulate their behavior. In this study, we will test whether individual differences in these three traits (Negative Emotionality, Positive Emotionality, and Effortful Control) predict increases in two common forms of behavior problems: internalizing and externalizing problems. 250 children aged 3 to 7 years participated in the study. At baseline, parents completed a validated measure of these three traits in their children. At 6-month follow-up, they completed a validated measure of their child's level of internalizing and externalizing problems. We will describe the pattern of associations between the 3 traits at baseline and the two dimensions of behavior problems at the 6-month follow-up.

ATTITUDES TOWARD CHOCOLATE
Devon Bement
Category: Psychology, Section 4
Poster: 389
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Brent Donnellan (Psychology), Richard Lucas (Psychology), Stevie Yap (Psychology)

Attitudes Toward Chocolate was testing whether exposure to photographs can impact the experience of eating chocolate. Some participants were exposed to a picture of money whereas others saw a different picture neutral picture. Hints in the psychological literature have shown exposure to pictures of money may take away from pleasurable experiences like eating chocolate. Specifically, a previous study suggested that pictures of money reduced the ability of people to savor everyday experiences like eating candy. Savoring seems to contribute to an individual's sense of well-being. Thus, this study is important because its overall purpose was to evaluate how savoring a piece of chocolate may help promote happiness. This information could intern help the community rate higher on well-being. The participants completed a brief questionnaire about their demographics ate a piece of chocolate and then filled out another questionnaire about their background attitudes. While the participants ate the piece of chocolate undergraduate research assistants assessed the participants savoring abilities on a 1-7 scale. This study is currently underway. Data will be complete in one month for analysis using SPSS. In my presentation it will be important to show two comparing datasets to show that a previous publication measuring the same domains either had the same findings or not. This research will display both datasets in order to increase life satisfaction to the public from both findings.

SOCIAL SCIENCE: GENERAL

ORAL PRESENTATIONS, SECTION 1

BIOPHILIC ATTRIBUTES OF COMMUNITY DEVELOPMENT: AN ANALYSIS OF SPACE, FOOD, AND SOCIAL NETWORKS
Kevin Adams
Category: Social Science: General, Section 1
Location: Lake Erie Room, 9:00 AM-9:15 AM
Mentor(s): Laurie Thorp (RISE)

Urban social environments are particularly complex systems. Considering equitable communities are critical to sustainable development, understanding how various aspects of community contribute to well-being is of great importance. Through the application of biophilic attributes to community traits on a Midwestern university campus, the intention of this study is to understand how space, food, and social networks impact community and may be related. In addition, these findings will serve as precursors for studying other urban contexts like city centers. The results of a web-based survey and several focus groups suggest that biophilic traits are in fact drivers of community health and can serve as foci for studying sustainable community development. At the same time, student perception of space, food, and social networks shows clear gaps in understanding as compared to the academic literature, highlighting the need for university curriculum revision. More work is

necessary to uncover specific mechanisms relating the areas of space, food, and social networks within community, but this area of research is promising and will serve to guide academics, urban planners, and policy makers as more information is gathered.

THE DIASPORA OUTSIDE OF THE DIASPORA: DOMINICAN STUDENTS IN MICHIGAN
Amazona Alfonso
Category: Social Science: General, Section 1
Location: Lake Erie Room, 9:15 AM-9:30 AM
Mentor(s): Cristian Dona Reveco (Sociology)

The Dominican Diaspora has been historically connected to New York and to a lesser extent to Florida, Boston, and Washington DC due to the large number of Dominican immigrants in these cities. These migrants arrived in three main waves, the political migration during the Trujillo era and the tumultuous times after the assassination of El Jefe, the migration boom of the 1980s, and the yolas of the 21st century. These are not, however, the only migration patterns or flows of recent Dominican migration. Using interviews and participant observation, through this research project I propose to study the migration of Dominican college-age people to the United States to pursue undergraduate degrees. Using fellowships provided by the Dominican government a growing number of students are coming every year to study at MSU or at WMU. I intend to study the social and cultural capital of these students and the connections that they maintain with their homes, as well as the contexts of their emigration, the experience of arrival, and incorporation to the culture of the Midwestern universities. I will also explore the maintenance of a Dominican identity and culture while geographically far away from the traditional migration zones. I am interested in studying how the memory of Quisqueya helps them maintain their identity and how this can influence return projects. Finally I will explore the notion of “sexile” and how this fellowship is used by families and fellows to escape social criticism and repression for having a non-conforming sexual identity.

CRANIAL FRACTURE PATTERNS IN PEDIATRIC DEATHS: HOMICIDES AND ACCIDENTS
Kelsey Carpenter
Category: Social Science: General, Section 1
Location: Lake Erie Room, 9:30 AM-9:45 AM
Mentor(s): Todd Fenton (Anthropology)

This study investigates human pediatric deaths involving head injury and cranial fractures. The goal is to distinguish cranial fracture patterns that occur accidentally from those that result from inflicted injury. This study is important because there is a lack of cranial fracture standards for infants and young children. As a result, pediatric deaths involving single event head injuries with associated cranial fractures represent one of the greatest medico-legal challenges. Forensic anthropologist Dr. Todd Fenton, in collaboration with engineers Dr. Roger Haut and Dr. Anil Jain, has received funding through the National Institute of Justice to begin research on this topic. One focus of this project is to collect forensic data from medical examiner’s offices from across the country on cases of pediatric deaths involving cranial fractures. Data collected from the autopsy photos or diagrams provided by the medical examiner include: age, injury scenarios, fracture type, fracture location, total number of fractures, average number of fractures, and fractures that cross sutures. These data will be used to answer the following research question: Do pediatric deaths resulting from high energy accidents and homicides display distinctly different fracture patterns? The data will be graphically analyzed to reveal trends and answer the research question. This research will work to fill a significant scientific gap in the ability to interpret pediatric cranial trauma.

BREAKING INTO THE BOYS' CLUB: A SOCIOLOGICAL STUDY EXAMINING GENDERED EXPERIENCES IN SCIENCE
Madison Fitzgerald
Category: Social Science: General, Section 1
Location: Lake Erie Room, 9:45 AM-10:00 AM
Mentor(s): Nancy DeJoy (Writing, Rhetoric, and American Cultures)

The purpose of the project is to understand gendered experiences in science for women, using the Michigan State University Department of Physics and Astronomy to gather data. It will first, define "equality", second, evaluate the data, and third, come to a conclusion on how "equal" the department is for women. The critical questions that will be 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 will likely confront repressive gender-based policies and habits of mind in science to understand gendered power dynamics in both science itself and the scientific workplace, the socialization of science and math as masculine, social inequality of men and women, and the glass ceiling.

URBAN SUSTAINABILITY AND THE ELDERLY: DETROIT AND HAVANA
Shannon Fitzpatrick
Category: Social Science: General, Section 1
Location: Lake Erie Room, 10:00 AM-10:15 AM
Mentor(s): Rene Hinojosa (Urban and Regional Planning)

My research is about addressing the needs of the elderly in Havana, Cuba and how those needs are provided for. This is important because Cuba is an aging country, the only country in Latin America where the elderly population (60 years and older) outnumbers the youth population (0-14 years). I interviewed and talked to elderly people in Havana, Cuba, as well as people working at organizations that aim to help the elderly to see what the needs of these people are, what is set up to provide for them, and the realities the elderly population face daily. I am going to present on my findings of what is there to provide for the elderly and the actual realities of how the needs are actually met in Havana, Cuba.

PHYSICAL ABUSE, SUBSTANCE DEPENDENCE, AND RECIDIVISM
Sara Hughes
Category: Social Science: General, Section 1
Location: Lake Erie Room, 10:15 AM-10:30 AM
Mentor(s): Merry Morash (Criminal Justice)

A multitude of research has been conducted to argue that suffering from physical or sexual abuse, both in childhood and adulthood, poses a risk factor for developing substance abuse problems. Furthermore, substance abuse problems correlate with a higher rate of recidivism. Previous studies have focused on the phenomenon that suffering from sexual and physical abuse in childhood plays a large part in predisposing an individual to become dependent on drugs or alcohol. This study collected data on 402 women that were on probation and parole for various crimes. It took measures of whether or not they had suffered abuse in either childhood or adulthood, and whether or not they struggled with substance abuse problems currently or in the past. The study also examined case report data completed by the probationer or parolee's agent to identify if the agent saw signs of the respondent using drugs or alcohol while they were under supervision. Next, records from the State of Michigan were reviewed to determine the total number of arrests and convictions of the respondent, and more specifically the number of convictions related to drugs or alcohol that the respondent had acquired in the last 12 months. The results of this study will help us to better understand the risk that childhood and/or adulthood physical or sexual abuse poses on the individual's development of substance abuse problems, and subsequently criminal recidivism.

A STUDY IN THE COMMERCIALIZATION OF BLACKNESS; AS WRITTEN BY A SNEAKERHEAD
Kevin Witenoff
Category: Social Science: General, Section 1
Location: Lake Erie Room, 10:30 AM-10:45 AM
Mentor(s): Emilie Diouf (African American and African Studies), Michael Wilson (African American and African Studies)

The purpose of this research is to consider and analyze social and economic effects that the commercialization of "blackness," specifically through Nike's Black History Month (BHM) Collection. The aim is to consider what this impact this commercialization has had on the perception and actuality of BHM's effectiveness towards the month's original goals of promoting and educating about African American's experiences and achievements. My research calls attention to the common association of "blackness," with coolness, and how this deviates from founder Carter G. Woodson's original intentions for the month of observance and enlightenment. Within my research this "coolness" as it pertains to black popular culture will be explored as it relates to existing hegemonic structures along with an in depth conceptualization of how Nike is utilizing it as a marketing utensil and thus diminishing the understanding and appreciation for the Month's original intentions and impeding upon the Month's social effectiveness. Additionally considered are the problems that arise from a company that is operated by white executives, financially exploiting the celebration and recognition of a historically and systematically oppressed minority. The combination of this intensive commercialization and intentional exploitation is so prominent that it has even begun to facilitate the problems that BHM initially intended to relieve. I intend to explore the severity of the problem and through that understanding offer Nike's administration suggestions on how they can adjust their operations to begin alleviating, rather than heightening the barriers that Carter G. Woodson intended to hurdle.

ORAL PRESENTATIONS, SECTION 2

THE SOCIAL SINE WAVE
James Adams
Category: Social Science: General, Section 2
Location: Lake Erie Room, 1:00 PM-1:15 PM
Mentor(s): James Lucas (Undergraduate Education)

When the disagreement regarding inequality in Detroit reached its breaking point in 1967, the city did not have the ability to force any major changes in policy to mend the situation. US economic policies did not prohibit the huge financial separation (which led to social separation) that was present, and in the resulting chaos, the wealthy Detroiters jumped ship. In Cuba, however, when a similar disagreement culminated, the vast majority of citizens opposed capitalism, and brought about a shift towards socialism with the Revolution, going against its former politics unlike Detroit. It is my claim that Cubans mimic a pattern in policy preferences that resembles a sine wave over time, reverberating between socialism and capitalism, and it can be observed through social interactions, living areas and job choice. And while this pattern can be observed across the world, Cuba is an interesting example, because its total political reconstruction allowed for much more dynamic shifts in

these areas, so one could say the sine wave's frequency increased for Cuba. Cuba's recent leaning towards free trade is accredited to newer citizens being unaware of the former grievances of their society, as well as the lack of innovation or progression because of their current policies, and the country can be an effective reference for what and why certain social issues will present themselves if changes in policy are sought out in Detroit and other places.

BISTRATEGIC CONFLICT BEHAVIORS' INFLUENCE ON CONFLICT OUTCOME
Justin Cochran
Category: Social Science: General, Section 2
Location: Lake Erie Room, 1:15 PM-1:30 PM
Mentor(s): Cary Roseth (Counseling, Educational Psychology and Special Education)

Despite the frequency of peer conflict in preschool classrooms, little is known about way different conflict behaviors influence conflict outcomes. Accordingly, this naturalistic observation study examines the relationship between preschoolers' bistrategic resource control and conflict outcome. Bistrategic resource control involves the use of both coercive and prosocial resource control strategies. The video data for this study was collected over two months in seven Head Start preschool classrooms. We recorded 343 total dyadic conflicts and, using video coding software, coded conflict strategies (coercion, prosociality, or neutral) and the conflict outcome – i.e., who "won" the conflict by securing the conflictual resource (e.g., control of toy, social influence), who "lost" the conflict by giving up control of the resource. We predict that bistrategic resource control will more frequently result in winner outcomes compared to conflicts involving only coercive or prosocial resource control strategies. The findings of this study will contribute to the understanding of the nature of conflict. The findings may also inform the way early education teachers facilitate preschoolers' constructive conflict resolution.

TURN OF THE CENTURY MOTIVATION FOR MIGRANTS COMING FROM ITALY TO THE U.S.
Katherine Grover, Lauren Collins, Lining Pan
Category: Social Science: General, Section 2
Location: Lake Erie Room, 1:30 PM-1:45 PM
Mentor(s): Cristian Dona Reveco (Sociology)

Our research is centered on the motivations of why migrants came to the United States from Italy dating back to the late 1800s and the early 1900s. The importance of this study is to expand the research of what the main reasons were for Italian migrants to leave their families, friends, and cultures behind to come to the United States. The reason we chose to focus on migration from Italy is because from the late 1800s to the early 1900s about 32 percent of the Italian population came to the United States because of economic opportunities, family, or other reasons. We plan on performing this research by analyzing the transcripts of interviews from the Ellis Island Oral History Project provided on the North American Immigrant Letters, Diaries, and Oral Histories webpage which can be accessed through the Michigan State University library website. Reviewing the transcripts of these interviews, where Italian migrants give first-hand accounts of their struggles in Italy and their journeys to the United States, reveals why these people chose to come over in the first place. In this presentation we will summarize the Italian migrants' main motivations to come to the United States through an oral presentation.

CHILEAN IMMIGRANTS IN THE CALIFORNIA GOLD RUSH
Brittany Losey, Katie Armbrustmacher, Zachary Timmerman
Category: Social Science: General, Section 2
Location: Lake Erie Room, 1:45 PM-2:00 PM
Mentor(s): Cristian Dona Reveco (Sociology)

The purpose of this research is to analyze the sacrifices and motives of Chilean immigrants during the California Gold Rush in 1848 to 1855. Chilean immigrants played a key role in the gold rush. They were the largest group of migrants from South America. The goal of this research is to show what Chilean immigrants gave up in order to move to the United States of America in hopes of getting rich and making a better life for themselves by collecting gold. The research will be a narrative analysis. The narrative analysis approach will be able to extract sacrifices and motives of the migrants as they retell their stories of migration through letters. The research will be collected by looking at immigrant letters describing a first hand account of what the migrant was thinking and experiencing during the California Gold Rush and the conditions during migration to the United States of America. Upon reading multiple letters it became clear the Chileans had a common motive of creating a better life for themselves with the hopes of reuniting with family or creating a family. Common sacrifices were moving away from family, and losing land and fortunes in their home countries. This research is not only valuable to study to get insight to history but also for the future of immigration. By analyzing the migrant letters an insight to the migration decision process can be gained.

REMOVING STIGMA: EXAMINING THE IMPACT OF HOMOSEXUALITY ON AFRICAN IDENTITY POLITICS
France Elvie Banda
Category: Social Science: General, Section 2
Location: Lake Erie Room, 2:15 PM-2:30 PM
Mentor(s): Michael Wilson (African American and African Studies)

The African continent has become synonymous with being anti-gay. In about 38 African countries, from Nigeria to Uganda, homosexuality remains a crime and in some countries a capital offense. News outlets headline the latest anti-gay law passed by Nigerian President Goodluck Jonathan that mandates a 14-year prison sentence for anyone entering a same-sex union and a 10-year term for "a person or group of persons who supports the registration, operation and sustenance of gay clubs, societies, organizations, processions or meetings". The popular discourse surrounding homosexuality within the context of the African continent is plagued with violence, celebrated intolerance and bigotry. In light of this condemnation against African homosexuals, the reality of their existence and negotiations for space within African societies and their impact on the native and immigrant communities they live in must be explored. In this research, I determine the extent to which homosexuality impacts African identity both within the continent and abroad and ultimately open channels of discourse for groups of Africans both homosexual and heterosexual to discuss homosexuality. The research employs surveys of Africans and African immigrants at Michigan State University focusing on two sample categories, cultural environment and age, to reveal the differences in opinions and attitudes on homosexuality within the diverse community of Africans. I argue that the repression and resistance of African homosexuals provides a space for the self-examination and complication of African identity as it relates to the fluidity and complexities of human sexuality.

COMMUNITY CONNECTIONS: HIGHLIGHTING THE SOCIAL ASPECTS OF THE INTEGRATION PROCESS FOR RESETTLED REFUGEES
Justine Brunett
Category: Social Science: General, Section 2
Location: Lake Erie Room, 2:30 PM-2:45 PM
Mentor(s): Rodrigo Pinto (James Madison College)

Integrating into American society is not an easy process for the tens of thousands of refugees who are given the opportunity to resettle here each year. The refugee resettlement program aims ultimately for the full integration of refugees into American society, but it currently focuses most of its efforts only on economic self-sufficiency for refugees through employment. While economic self-sufficiency is obviously an important part of the integration process, an exclusive focus on employment obscures the social aspects of integration. If resettled refugees find jobs but never connect with other people in America—domestic-born Americans and even other foreign-born people residing in America—it is inaccurate to conclude that they have fully integrated into American society. Furthermore, social connections both with other foreigners and with domestic-born Americans can improve refugees' ability to become economically self-sufficient. Drawing from scholarly research and my own experience interning with a refugee resettlement agency in Lansing, this paper argues that for the refugee resettlement program to attain its goal of complete integration of resettled refugees, it must emphasize more strongly the complex social aspects of integration—the connections refugees build with foreign-born and domestic-born Americans—both because they can enhance economic self-sufficiency and because they themselves are an inherent part of integration.

POSTER PRESENTATIONS, SECTION 1

THE MOTIVATIONS OF SUSTAINABLE URBAN FARMING IN MICHIGAN AND CUBA
Maria DeNunzio
Category: Social Science: General, Section 1
Poster: 395
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rene Hinojosa (Urban and Regional Planning)

This paper will examine the motivations behind the continued use of organic urban farms in Cuba. It will explore the environmental, ethical, and logistical reasons for the maintenance of the urban farms. Cuba, and particularly Havana, has done a masterful job of integrating urban farms into their food supply chain. The insights gained from research in Cuba can be translated into making real changes in the food supply chain of Detroit. Detroit, like Havana once did, has many abandoned buildings and lots. If Detroit can apply the Cuban method of urban farming, great strides in the revitalization of the city could be made. This paper will also discuss the problems that Havana faces in expanding its urban farm movement. The knowledge about Havana's urban farms was acquired through a site visit, an interview of a farmer, and several casual conversations with stand holders at local markets. Many of the obstacles to the expansion of the urban farming movement were discovered through observations of Havana and through conversations with community leaders in a Havana neighborhood. Detroit should now be able to recognize these problems and work around them. The presentation will focus on the motivations of continued organic farming in Havana, the obstacles that Cubans face in expanding the urban farm movement, and how Detroit can apply Cuban methods to its own urban farm movement. The topics covered in the presentation will be framed as a comparison between Detroit and Havana.

CONSUMERISM ACROSS CULTURES AND THE HAPPINESS IT PRODUCES: A COMPARATIVE ANALYSIS OF CUBA AND THE UNITED STATES
Catherine Polgar
Category: Social Science: General, Section 1
Poster: 396
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rex LaMore (Center for Community and Economic Development)

This study will compare the consumption habits and levels of happiness associated with residents of the United States and Cuba. Previous studies, such as Csiksentmihalyi's *The Costs and Benefits of Consuming*, have indicated that happiness and consumer behavior are weakly correlated after a certain level of basic needs are met. (Csiksentmihalyi, 2006) In fact, many countries that have less stuff rank higher on social evaluations such as the Happy Planet Index. This idea leads to the question of whether the value American society places on material wealth is valid. This study, which was conducted both in East Lansing, Michigan and Havana, Cuba, will seek to determine if the American idea of more being better is merely a cultural nuance or if it is an ingrained part of human nature. This study will also try to determine if consuming more actually makes a person happier. The research was gathered by surveying individuals about their consumption habits and level of happiness as they left stores in their respective country. A literature review and direct observation of how consumption affected each society also contributed to the research. This presentation will synthesize previous studies on how consumption is related to happiness, data from various development indexes, as well as primary data collected in Cuba and the United States.

THE CONSEQUENCE OF LIVING IN ETHNIC ENCLAVES ON MIGRANTS' CULTURAL ASSIMILATION
Oly Kar, Adrian Ianchis, Tyler Powers, Mariah Schlis
Category: Social Science: General, Section 1
Poster: 397
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Cristian Dona Reveco (Sociology)

A driving question in the study of international migration is how cultures of different nations transcend borders. Throughout history, there's been evidence of political tension developing as a result of the creation of ethnic minorities in democratic nations. Researching into this problem has the potential to incite a better understanding as to why migrants tend to condense into specific areas. The objective of this project is to explore how the formation and maintenance of ethnic enclaves affects the acquisition of the English language for immigrants settling in the United States. We will be collecting population data from the US Census to determine the Mexican, Cuban, Chinese, and Lebanese populations of cities where each ethnicity makes up a large portion of the population (e.g. San Antonio, TX, Miami, FL, San Francisco, CA and Dearborn, MI). In order to measure the migrants' English acquisition, the number of individuals in these populations that speak their respective languages at home will be determined, in comparison to other variables that affect cultural assimilation (e.g. income, homeownership, education and citizenship). We argue that migrants who reside in ethnic enclaves will have a more difficult time becoming proficient in English, since they would be surrounded by others of the same origin, thus encouraging them to speak their native languages, as opposed to acquiring the United States'.

INFLUENCE OF ORIGIN COUNTRY ON ASSIMILATION OF FIRST AND SECOND GENERATION MIGRANTS
Stephen Manning, Marcus Fields, Jason Jonckheere, Laura Keller, Nick VanAcker
Category: Social Science: General, Section 1
Poster: 398
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Cristian Dona Reveco (Sociology)

The reasons for international migration are complex and generally influenced by many factors personal and practical. In many instances the end goal of migration is to achieve an improved socio-economic status and facilitate a better life for successive generations of family members. The extent to which migration decisions influence the education, income, and occupations of second generation migrants, relative to their first generation parents, is a practical question to address for migration. The mobility of these characteristics may indicate differences in the ease to which each generation assimilates in the new country. Additionally, different levels of mobility between first and second generations could be influenced by the developmental status of sending countries. It is predicted that first generation individuals coming from less developed countries will have children whom achieve marginally higher education, income, and occupational status relative to their parents due to socio-economic restrictions in assimilation. Conversely, individuals from more highly developed countries will have greater variability between first and second generations as a result of greater socio-economic means for assimilation purposes. This explorative comparative analysis considers first and second generation immigrants to the United States from three countries of varied developmental status. The countries of Mexico, India, and Haiti are examined, corresponding to high, medium, and low developmental status as determined by their associated Human Development Index. Analysis of census data for education level, income level, and occupation of first and second generation migrants is performed using bivariate statistical analysis.

MEDIA'S INFLUENCE ON MIGRATION DECISIONS IN IRELAND AND THE UNITED STATES DURING THE GLOBAL ECONOMIC CRISIS
Mariam Anwar
Category: Social Science: General, Section 1
Poster: 399
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Cristian Dona Reveco (Sociology)

Our objective is to demonstrate the importance of the effects on migration decisions. This research is done in effort to highlight the specific factors that influence migration. This topic is relevant to the study of society and migration because it involves the influence of society in empowering the lives of migrant groups who struggle to adapt. Recent studies have suggested that global economic crisis (Irish financial crisis) may affect the migration of a group of people such that the rate of that specific group migrating to the United States or Ireland increases. Major Irish and U.S. media outlets will be utilized in an effort to express how political opinion on the global economic crisis in the country is shaped. Newspapers from 2005 to 2012 and migration rates will be analyzed to see if any correlation is present. This research is to stress the how the media's representation of the crisis correlates with a migrant's decision to relocate. It is essential to understand whether migration to the United States and Ireland is impacted by a cause and effect scenario or by random motives. By understanding the motives behind migration, it allows society to grasp a better sense of how the world works and what can be done if negative aspects of a sending country influence migration. This information will be presented in the form of a poster based on data from both countries as well as data from the United States.

HINDU, BUDDHIST, AND MUSLIM ASSIMILATION TO THE UNITED STATES
Jessica Ozog, Alycia Drwencke, Heather Graves, Aakash Sapre
Category: Social Science: General, Section 1
Poster: 400
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Cristian Dona Reveco (Sociology)

Groups that come to the United States each year can be classified by many different categories. For this project, we will be categorizing migrants based on their religious backgrounds. The migrant groups that we will research are Hindus, Buddhists, and Muslims. We will research these migrants to find out where they are settling in the United States, and how assimilated each group is. Many of these migrants migrate through networks and settle in areas of high concentration of people with similar cultures and religions. To determine their assimilation, we will compare incomes and education levels of people in areas with a highly concentrated population of each religious background to the incomes and education levels of average American non-immigrants living near that area. We will gather data from the Social Explorer, PEW Research Center, and census reports in order to help us determine how well Hindu, Buddhist, and Muslim migrants are assimilating into American culture. The "foreign born" feature of Social Explorer's web based application allows us to see regions of the US that are populated by migrants from specific areas. The "US Religious Landscape Survey" from the PEW Research Center provides information about the US's population through the following categories: Affiliations, Maps, Portraits, and Comparisons. Language and communication statistics from US Census data will also be considered in the process of determining which areas to study. Based on our research, we will be able to determine if migrants' religious background is relevant to the process of assimilation into American culture.

AN EXPLORATORY ANALYSIS ON FOREIGN BORN ATHLETES' COMPETITIVENESS WITH U.S. BORN PLAYERS IN MAJOR LEAGUE BASEBALL: FOCUSING ON PLAYERS FROM THE DOMINICAN REPUBLIC AND VENEZUELA
Vincent Szlachtun, Sydney Dudley, Patrick Mulrenin, John Neidhart
Category: Social Science: General, Section 1
Poster: 401
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Cristian Dona Reveco (Sociology)

This research intends to look at the effectiveness of individuals who migrated from the Dominican Republic and Venezuela to the United States to obtain a career in Major League Baseball. The aim is to find out if these migrants are able to be as competitive, if not more, with U.S. born players. Competitiveness will be defined in our context by a statistical analysis at each position including a comparison of salaries. The importance of our research is to see if the two largest migrant countries for MLB are staying competitive with U.S. born players and what that might mean for future migrant athletes. The research will be complied using the official websites of MLB and ESPN as well as newspaper or journal articles documenting the number of foreign born players in Major League Baseball. Our presentation will highlight our findings in a graphical representation of each statistical category that will show the comparison of Dominican and Venezuelan migrants to their U.S. counterparts at each position.

POSTER PRESENTATIONS, SECTION 2

MULTILATERAL AND BILATERAL ARMS CONTROL AGREEMENTS
Teresa Dettloff
Category: Social Science: General, Section 2
Poster: 404
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Matthew Zierler (James Madison College)

While multilateral arms control efforts are effective in facilitating the non-proliferation movement among states that are not nuclear powers, the multilateral approach is unable to elicit tangible results in reducing the arsenals of powerful countries who derive security and prestige from having nuclear weapons; this is explained by a lack of specific flexibility provisions, international institutions that become too far removed from the wishes of the state, and challenges in monitoring compliance and instituting enforcement mechanisms. Conversely, bilateral arms control agreements are the most effective way to pursue arms control policy because they allow for a certain degree of flexibility within the respective agreements that allows compromise to be reached and results to be achieved in the tangible reduction of arms, and measures of verification and compliance are more effective on a state to state level, proving that bilateral agreements are the most prudent mechanism for pursuing arms control. This is not meant to disavow multilateralism; multilateralism has been extremely successful in agreements encompassing the banning of land mines, environmental issues, and many more issue areas. The non-proliferation movement has also been successful, which is facilitated by multilateralism. However, when it comes to reducing the arsenals of nuclear powers, such as the United States and Russia, the bilateral approach has proven to lead to greater strides in the reduction of nuclear weapons than the multilateral approach.

AN ANALYSIS OF DENTAL DEFECTS IN CAVE AND ROCKSHELTER BURIAL POPULATIONS, CENTRAL BELIZE
Bethany Slon
Category: Social Science: General, Section 2
Poster: 405
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Gabriel Wrobel (Anthropology)

While we may never completely understand the full history of ancient societies, some indicators are left behind that give archaeologists clues to help interpret the ways past populations lived. The human dentition, for example, is a powerful indicator of a population's health, diet, stress, disease, and status. My research examines dental remains of Maya individuals buried in a variety of cave and rockshelter contexts in the river valleys of Central Belize, specifically focusing on tabulating and scoring dental caries and linear enamel hypoplasias according to established bioarchaeological standards. Dental caries (cavities) typically result from high carbohydrate diets in combination with poor dental hygiene, while linear enamel hypoplasias can result from a variety of stresses experienced by an individual during development. This project investigated whether individuals from different locales (rockshelters or caves) in the area showed different patterns of dental disease. Variations in health imply differences in life experience, and a possible explanation would be a migration of multiple groups into the area. I incorporate existing anthropological literature on cave and rockshelter mortuary ritual to situate my study in a regional context.

A COMPARATIVE STUDY OF ENERGY CONSUMPTION BETWEEN THE UNITED STATES AND CUBA
Alexandria Cedergren
Category: Social Science: General, Section 2
Poster: 406
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Rex Lamore (Outreach and Engagement Partnerships)

I have conducted a comparative research project on the consumption of energy between Detroit, Michigan, and La Habana, Cuba. I specifically analyzed the use of fossil fuels in each area and also the impact of transportation on their energy consumptions. My research is important because our fossil fuels are rapidly depleting and it is imperative that we find a way to slow the process of exhaustion. It is also important to note the differences between the two countries where the information accumulated could aid either country in the future. My research was done mainly by observation in both countries. In addition to online research I also conducted an interview about transportation with our tour guide Laura in Cuba. With my extensive research I will present on how both societies have different views and customs in regards to transportation and energy consumption.

DIG THE PAST: A HANDS-ON INTRO TO ARCHAEOLOGY
Maxwell Forton
Category: Social Science: General, Section 2
Poster: 407
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lynne Goldstein (Anthropology)

The MSU Campus Archaeology Program (CAP) seeks to preserve the unique cultural heritage of our university buried beneath our very feet. As archaeologists it is our mission to discover and interpret the activities of past peoples through the material culture they left behind. But scholarly research is only as effective as its ability to reach and educate the general public. Dig the Past: A Hands-on Intro to Archaeology is a CAP education program hosted monthly at the MSU Museum for the 2013-2104 academic year. The program has sought to take archaeology out of the classroom and make it a hands-on experience for a curious public audience, through a variety of immersive activities that simulate the many processes of an archaeological dig. Run by a half-dozen student volunteers, the program has brought archaeology into the lives of scores of families from the greater Lansing region. In order to gauge the effectiveness of our program, we request each family to voice their thoughts on their experience through an anonymous feedback form. From this we have been able to breakdown the types of experiences visitors are having and see how Dig the Past has expanded their perception of what archaeology is. This poster will present information gathered from feedback and discuss the ways in which it supports CAP's outreach mission. Dig the Past is in effect a proving ground of methods of presenting the research of a world-class university in a way that is approachable and meaningful to our wider community.

EARLY CHILDHOOD EDUCATORS' BELIEFS AND PRACTICES FOR TEACHING LETTER KNOWLEDGE TO PRESCHOOLERS
Jacqueline Pitone
Category: Social Science: General, Section 2
Poster: 408
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Hope Gerde (Human Development and Family Studies)

Children's letter knowledge when they enter kindergarten is the strongest predictor of later reading achievement (National Early Literacy Panel, 2008) and predicts children's literacy skills into high school (Cunningham & Stanovich, 1997). Unfortunately, children living in poverty, such as those attending Head Start, typically can name fewer letters than their middle income peers (Gerde, Skibbe, Bowles, & Martoccio, 2012), resulting in a wide gap in children's skills and high risk for reading difficulties later. Understanding Head Start teachers' beliefs and practices for supporting letter knowledge within the classroom may help to identify how Head Start promotes children's letter knowledge. Specifically, my research aims to identify Head Start teachers' beliefs about and practices for supporting letter knowledge. I expect teachers to vary in their beliefs and practices and that their beliefs will inform their practices. To gather data, trained graduate and undergraduate researchers conducted structured interviews with 35 Head Start teachers. The interviews lasted 15-20 minutes, and consisted of demographic questions and 17 questions related to the teachers' beliefs and practices for supporting letter knowledge. The interviews were audio recorded for accuracy then transcribed verbatim by undergraduate researchers. Researchers will use grounded theory and a constant comparative analysis (Strauss & Corbin, 1999) to qualitatively analyze the interview data. Results and implications for practice will be presented and discussed in the presentation.

CULTURE SHOCK
Jonathan Cope, Xi Chen, Alexander Heavin, Wei Li, Danlin Wang
Category: Social Science: General, Section 2
Poster: 409
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Cheryl Caesar (Writing, Rhetoric and American Cultures), Kate Fedewa (Writing, Rhetoric and American Cultures)

What resources will be most useful for students enduring culture shock? We seek to better understand culture shock and its effects on students at MSU, in order to conclude the necessary information that will be the most helpful for them. Culture shock appears everywhere which differs in different countries and ethnic groups, especially between different literacy groups and communicating between them. We have found that the right information is the key to these students success when dealing with culture shock. Information creates awareness and understanding, when students understand what they and many others may be going through, it is much easier to overcome these obstacles. We will focus our presentation towards the key factors that induce culture shock and the ways every student can deal with it to reduce the stress related symptoms that often occur as a result. After interviewing professors and surveying college freshmen from a variety of backgrounds, we believe the best resources for students enduring culture shock are resources that discuss social and emotional well-being, and information on everyday activities. Such information is important to every student attending MSU, because no matter where students come from MSU presents an entirely new culture to its students.

THE HOME LEARNING ENVIRONMENT AS A MEDIATOR OF THE RELATION BETWEEN CHILDREN'S SELF-REGULATION AND EARLY LITERACY SKILLS
Marissa Fang
Category: Social Science: General, Section 2
Poster: 410
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lori Skibbe (Human Development and Family Studies)

Self-regulation is the ability to manage emotions, impulses and behaviors. For children, it affects their ability to focus on learning tasks appropriately, perhaps limiting their time engaging in learning activities (Montroy et al., in press). We will examine whether children's self-regulation relates to their literacy abilities in part through the home learning environment that parents provide to children. Our sample includes 118 children (40 girls; 78 boys) ranging from 3-5 years of age (Mean age = 49.52; SD = 6.41). We measured self-regulation using the Head-Toes-Knees-Shoulders task administered to children (Ponitz et al., 2009). Literacy skills were measured using the Woodcock Johnson Tests of Achievement (Woodcock & Mather, 2001). The home learning environment was measured with a self-report questionnaire on home reading and learning practices from Morrison and Cooney (2002). We hypothesize that children's self-regulation will be positively related to the home learning activities that they are exposed to which will then predict children's literacy skills. We will test this hypothesis using a mediation analysis.

POSTER PRESENTATIONS, SECTION 3

STUDYING THE HEART OF MSU USING GEOGRAPHIC INFORMATION SYSTEMS
Josh Schnell
Category: Social Science: General, Section 3
Poster: 414
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lynne Goldstein (Anthropology), Kathryn Meyers (Anthropology)

The heart of Michigan State University's campus is the space located within West Circle Drive. Historically, the first and second dormitory halls, Saints Rest and Williams Hall, stood here as well as College Hall, MSU's first laboratory, classroom, and administrative building. Today, the MSU Museum, Beaumont Tower, the President's House, and the now oldest building on campus, Linton Hall, remain. In 1870, the President of MSU designated the area as Sacred Space and declared that it should never be built on. Due to the area's importance throughout MSU's history, this area is of special interest to the Campus Archaeology Program. Using Geographic Information Systems (GIS), a mix of hardware, software, and mapping, we can reveal spatial and temporal patterns of deposits in the archaeological record. I have chosen to use archaeological data and finds from this area of campus to conduct a hotspot analysis and exploratory data analysis using GIS. A hotspot analysis will reveal geographic areas where we see a large number of artifacts compared to surrounding areas and I'll overlay the findings with a historic map of campus in order to reveal spatial relations between historic buildings and what we find today in the archaeological record. Exploratory data analysis will reveal interesting aspects about this data set such as the density of artifacts recovered by area, the geographic "center" (median) of this data set, and other statistical measures.

PREHISTORIC C14 DATING AT AZTALAN
Ian Harrison
Category: Social Science: General, Section 3
Poster: 415
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lynne Goldstein (Anthropology)

Under the direction of Dr. Lynne Goldstein, Michigan State University conducted prehistoric archaeological excavations at the Aztalan site in southern Wisconsin. Aztalan is a Native American village dating to ca. AD1000-1200, and contains a series of large earthen mounds. Excavations were conducted at two unusual locations within the site, a smaller mound known as The Gravel Knoll, as well as locations along the western edge of the village's enclosing palisade wall. Contrary to current archaeological opinion, we discovered that the gravel knoll is a significantly humanly modified surface, and the entrance to the prehistoric site may be more complex than was previously thought. There are two prehistoric cultures represented at Aztalan, and my project sought to identify potential samples for C-14 dating to get a better understanding of the age range for each of the excavation areas, as well as to compare data from previous excavations at Aztalan. Sample dating was performed using a series of radiometric and Accelerator Mass Spectrometry (AMS) Carbon-14 isotope dating methods. The processes of sample selection, preparation, and analysis are discussed, as well as the implications of the results for both the individual excavation areas and larger Aztalan site.

LET'S TALK ABOUT MENTAL HEALTH: PUERTO RICAN OLDER ADULTS AND DEPRESSION
Adriana Carreon
Category: Social Science: General, Section 3
Poster: 416
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Daniel Velez Ortiz (Social Work)

The purpose of this study was to create culturally grounded knowledge about awareness, misconceptions, and personal beliefs associated with depression among older Puerto Rican adults 60 years and above. Census Bureau projections show, Puerto Ricans are the second largest Latino group in the United States with a total population increase from 3.4 million in 2000 to 4.6 million in 2010. Research has found Puerto Ricans to have the highest likelihood of psychiatric disorders among

all Latino groups. Further, mental health service utilization and outcomes have been found to be consistently poor for Puerto Rican older adults when compared to other groups of older adults. This study used focus group interviews with Puerto Rican older men (n=13) and women (n=12) in Cleveland, Ohio. Interview data was transcribed and analyzed to identify patterns and cultural expressions as well as perceptions on depression expressed by the participants. With this presentation, I will show results from focus groups data analysis, which preliminary show that there are similarities and differences among female and male perceptions about depression. Men were more likely to externalize depression's symptoms through violence, while women hide symptoms avoiding judgment by others. Additionally, men expressed causes for depression in terms of economic issues, whereas women expressed depression causes related to marital conflict. These stories will enhance our knowledge about Latino mental health by studying cultural perceptions of sub-groups. These findings can help to develop culturally relevant clinical interventions that are targeted to Puerto Rican older adults' experience of depression.

COLLABORATING ACROSS STATE LINES: PREPARING ARCHAEOLOGICAL MATERIALS FROM THE AZTALAN SITE (WISCONSIN) FOR CURATION
Megan Hall
Category: Social Science: General, Section 3
Poster: 417
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lynne Goldstein (Anthropology)

In summer 2013, Michigan State University conducted archaeological excavations, directed by Dr. Lynne Goldstein, at Aztalan State Park, a prehistoric site in Wisconsin dating to about AD 1000-1200. These excavations focused on two regions within the site in order to understand how these areas were used by the ancient inhabitants: a smaller mound known as the gravel knoll and locations along the western edge of the village's enclosing palisade wall, including a possible entrance to the ancient site. Contrary to current archaeological opinion, we discovered that the gravel knoll is a significantly humanly modified feature and the entrance to the prehistoric site is more complex than previously thought. After the excavations were completed, the artifacts came to MSU, where they were cleaned, sorted, and studied. I worked on sorting the artifacts into the organization system used by University of Wisconsin - Madison, the probable permanent home of the artifacts, because the artifacts must be returned to an accredited curation facility in Wisconsin. Sorting the objects involved two main stages: identification of the object and definition of the categories in the database. This process demonstrated both the problem of locating where to permanently house the artifacts and how miscommunication between partners causes confusion, two major problems encountered upon completing an excavation. My poster will include a summary of some of the artifacts recovered, the process of transferring collections into permanent housing (including sorting and analyzing the artifacts), and problems associated with this process.

REPRESENTATION OF EMOTION THROUGH WORDS AND GESTURES: DIFFERENCES IN FATHERS AND MOTHERS
Lauren Prainito, Paola Algarin
Category: Social Science: General, Section 3
Poster: 418
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Research suggests it is less acceptable for men than women to express vulnerable emotions: sadness, fear, and embarrassment[1]. Our study examines differences between mothers' and fathers' (a) emotion talk, (b) comprehension of children's emotions, and (c) intensity of gestural representations of emotion[2]. We expect lower intensity expressions from fathers as well as a reduced use of emotional words. This study uses data from an on-going project on relations between young children's emotional development and parents' expression of emotions. The current sample consists of 10 fathers and 10 mothers with similar ethnicities and education levels. Parents participated in the following tasks: (1) parents told their 12-month infants two open-ended stories, from which we coded emotion talk, and (2) parents were told a series of 6 stories about events that might elicit emotions (i.e., happiness, sadness, anger, fear, pride, embarrassment) from children and were asked to label, explain, and represent the emotions in their face and body. In our preliminary results, we found mothers and fathers differed in their responses to stories eliciting self-conscious emotions (pride and embarrassment); Mothers showed better comprehension of the story eliciting pride, and fathers showed less intensity when expressing embarrassment. No differences were found in emotion talk. These results confirm our hypothesis and extend prior research[1] on the socialization of males and females to differentially express emotions, particularly those related to vulnerability. These findings have implications for the socialization of young children's expressions of emotion, as well as their understanding of emotional situations.

CERAMICS AT THE AZTALAN SITE: RESULTS OF THE 2013 MSU EXCAVATIONS
Kyla Cools
Category: Social Science: General, Section 3
Poster: 419
Location: Ballroom, 9:30 AM-11:30 AM
Mentor(s): Lynne Goldstein (Anthropology)

During summer, 2013, Michigan State University conducted archaeological excavations, directed by Dr. Lynne Goldstein, at Aztalan State Park—a prehistoric site in Wisconsin (ca. AD 1000-1200). Excavations focused on two locations within the site in order to understand how these areas were used by ancient inhabitants. The two locations include a smaller mound known as the gravel knoll, and a second set of locations along the western edge of the village's palisade wall. Contrary to current archaeological opinion, MSU discovered that the gravel knoll had been significantly modified by humans, and the entrance to the prehistoric site may be more complex than previously thought. Students on the field school were introduced to archaeological methods and fieldwork, and various forms of pottery, projectile points, charcoal, animal bones, and interesting soil features. The goal of this project is to examine the various types of pottery that were found during these excavations and compare them to other ceramic collections excavated at Aztalan in the past. I will sort the pottery by the materials used to temper the clay (either grit or shell), and by the types of decoration (or lack of) on the pottery. This work will allow me to compare the frequency of different types of pottery found. For comparison I will use two dissertations that specifically focused on pottery types. Because these two excavated areas are not simply for habitation, pottery distributions and types may differ.

POSTER PRESENTATIONS, SECTION 4

THE DEVELOPMENT OF POSITIVE AND NEGATIVE EMOTIONAL EXPRESSION IN INFANTS AND TODDLERS: EVIDENCE OF SELF-REGULATION
Emily Karwoski, Tali Frankfort, Jimeka Hayes, Jasmine Ross
Category: Social Science: General, Section 4
Poster: 422
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Self-regulation refers to the processes that allow children to appropriately respond to their environment (Bronson, 2000). Early self-regulation is primarily reactive, influenced by external and biological factors that regulate emotional responses (Bronson, 2000). Self-regulation of emotion is responsible for modifying heightened levels of positive and negative expression of emotion (Kopp, 1989; Thompson, 1994). Our study will examine change in intensity of negative emotions from infancy to toddlerhood, but the role of emotion regulation in modifying expression of positive emotion is uncertain. We ask, does the intensity of negative emotion decrease during toddlerhood? And, how does the intensity of positive emotion change during this period? We expect that children will learn that feelings of frustration are temporary and can be altered; therefore a decrease in the intensity of negative emotions and a stability of positive emotions will be seen. We followed children and measured their expressions at 12, 18, and 24 months. At each wave, children were videotaped completing a series of four tasks designed to elicit pleasure and frustration. We will systematically code the parts of the face and upper body involved in the expression of emotions during each task. The intensity of each expression is determined by adding the number of facial and bodily movements used in the expression. We will compare the intensity of the emotions portrayed by the children at each age to determine whether their ability to self-regulate has increased in order to further understand the nature of self-regulation of emotion during early childhood.

I CAN'T TELL YOU, BUT I CAN SHOW YOU: PREVERBAL CHILDREN'S UNDERSTANDING AND REPRESENTATION OF EMOTIONS THROUGH GESTURE
Sam Pastoria, Jackie Evans
Category: Social Science: General, Section 4
Poster: 423
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

Despite extensive research on emotion knowledge in infants and preschoolers, little is known about how toddlers understand and represent emotions. By analyzing children's gestures and facial expressions at 24 months, this study aims to determine which, if any, emotions preverbal children are able to understand and represent. Thirty toddlers and their parents were each told a series of short stories, eliciting different emotions (happiness, sadness, anger, fear, pride, and embarrassment). Responses were videotaped as participants were asked how each character feels, and to show how the character feels. Both the adult and child videos were coded using a modified version of the Facial Action Coding System[1], with the toddler videos being coded to determine whether toddlers responded to prompts with gestures and facial expressions, and which, if any emotions they represented at 24 months. The data from the parent videos are used to confirm that the stories elicit the intended emotions. Our preliminary results indicate parents represent emotions distinctly through both gestures and facial expressions, which provides a way to measure children's understanding and representation of emotions at an age when emotion knowledge and receptive language skills outpace expressive language.

EFFECTS OF CAREGIVER'S EMOTION TALK ON CHILD'S EMOTIONAL KNOWLEDGE
Emma Nowak
Category: Social Science: General, Section 4
Poster: 424

Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Claire Vallotton (Human Development and Family Studies)

While there is a lot of research about emotional development in verbal children, there is little insight into individual difference in the emotional development of pre-verbal children. This study aims to describe influences on early emotional development by comparing caregivers' emotion talk in late infancy with child emotional knowledge in early toddlerhood. Research shows that emotion talk is influential in developmental outcomes for older, verbal children. However it is not clear whether the same will be true for younger, pre-verbal children. Caregiver emotion talk, which is used by approximately forty three percent of participants' parents, will be measured as the positive and negative emotion words parents use when telling a story to their child. In order to measure child developmental outcomes, children's emotional expressions and representations will be tested. Because both facial and body movements are meaningful displays of emotion, both will be used to measure children's emotional representations, an indication of their emotional knowledge. Children will be recorded when reacting to either successful or frustrating play (expression of emotion) and when they are asked to show emotional facial expressions depicted in stories (representation of emotion). This study will investigate whether aspects of caregivers' emotion talk to infants influences emotional development and will demonstrate that emotional development begins and is measurable before children can verbally communicate.

EVALUATING THE EFFECTS OF STATE-IMPOSED CONSTRAINTS ON MUNICIPAL FISCAL HEALTH
Sean Fitzpatrick
Category: Social Science: General, Section 4
Poster: 425
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Josh Sapotichne (Political Science)

Since the taxpayer revolts of the late 1970s, states across the nation have imposed limits on both the revenue and spending of local governments. These tax and expenditure limits, or TELs, are intended to prevent municipalities from overcommitting to public services and to protect taxpayers from ever-increasing property and sales tax rates, ensuring fiscal responsibility. However, TELs can also prevent municipalities from developing a diverse, stable stream of revenue and can encourage debt-financed spending, which can compound and even cause fiscal stress. This paper evaluates these two competing pressures to evaluate what effect TELs have had on the fiscal state of American cities in the past thirty five years. Preliminary data show that the unintended negative consequences of TELs have outweighed their intended effects.

FRACTURE INITIATION AND PROPAGATION IN PEDIATRIC BLUNT CRANIAL TRAUMA
Mari Isa
Category: Social Science: General, Section 4
Poster: 426
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Todd Fenton (Anthropology)

When an infant's death involves cranial trauma, abuse is often suspected. In such cases, forensic anthropologists may be asked to assess the cranial fractures and determine if they corroborate or contradict the history given by the child's caretaker. An accurate assessment depends on an understanding of cranial fracture mechanics: where fracture initiates, how fracture propagates after initiation, and how impact conditions affect these processes. Although there is a robust body of literature pertaining to these issues in adults, there has been little systematic study of cranial fracture in pediatric subjects. The goal of this two-part study was to establish a "ground truth" regarding pediatric cranial fracture mechanics. First, biomechanical impact experiments were performed in an infant porcine model in order to test hypotheses regarding fracture initiation, propagation, and injury outcomes in the developing cranium under known impact conditions. Later, pediatric forensic case data was retrospectively examined for similar links between cranial fracture characteristics and injury scenarios in human infants. The results of the porcine experiments affirm that, given a particular impact condition, the processes of cranial fracture initiation and propagation occur in a consistent manner and produce predictable fracture patterns. The results of the case-based human study indicate that impact-dependent processes of fracture initiation and propagation observed in the porcine experiments also occur in human infants. This research impacts the forensic science community by attending to a gap in knowledge in trauma analysis and providing practitioners with tools to more accurately assess pediatric cranial fractures.

INFORMING POLICYMAKERS: THE INFLUENCE OF INSTITUTIONS ON STATE LEGISLATORS' USE OF INFORMATION SOURCES ACROSS THE POLICY PROCESS
Taylor Joseph
Category: Social Science: General, Section 4
Poster: 427
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Cynthia Jackson-Elmoore (Honors College)

Constrained for time and with multitudes of decisions to make, state legislators rely on distinct sets of information sources when identifying public problems, drafting legislation, doing committee work, and deciding how to vote. These actors and groups vary from legislative insiders and mid-range actors, such as legislative staff and executive agencies (respectively), to legislative outsiders like grassroots organizations. Previous research suggests that whether or not, and when, a legislator uses particular information sources is a function of legislator demographics, district demographics, institutional characteristics and geographic region. Survey data from 24 states and U.S. Census data are used to explore the influence of legislative institutional characteristics on state legislators' reliance on information sources throughout the policy process. Specifically, logistic regression analysis is employed to examine the effects of legislative professionalism, term limits and party competition on legislators' information usage. The models also account for variation in region as well as legislator and district demographics. The dual focus on stages of policy-making and proximity to the policy process provides interesting insights.

COMPARING INTERNATIONAL MIGRATION OF STUDENTS TO MICHIGAN OVER TIME
Michael Swartz, Phillip Baeza, Alexandria Joo, Danielle Smith
Category: Social Science: General, Section 4
Poster: 428
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Cristian Dona Reveco (Sociology)

For this project we will focus on international migration of students to universities in the state of Michigan. For many years now, students have been coming to Michigan for university education. We will use the four most populous research universities in the state of Michigan; Michigan State University, University of Michigan, Western Michigan University, and Wayne State University. Our hypothesis is that international migration for education purposes has increased over the past few decades and we will investigate reasons as to why this trend is occurring. This topic is important because, this will give us insight into how mass migration of skilled people will affect our society. Another example of this is the proposal to bring 50,000 new skilled immigrants to Detroit. We will find data through the demographics that can be found from school websites/resources, the US census. Our focus will be on undergraduate student populations, including the following conditions; the students must be foreign born, between the ages of 18-22, in the undergraduate program at the aforementioned universities, and no local households (they must have come from their country of origin directly for the sole purpose of attending university).

POSTER PRESENTATIONS, SECTION 5

FOOD INSECURITY, FOOD STRETCHING, AND FOLATE INTAKE AMONG ARIAAL MOTHERS IN KENYA
Allison Apland
Category: Social Science: General, Section 5
Poster: 431
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Masako Fujita (Anthropology)

Food insecurity is a situation where people do not have the physical or financial ability to get the foods they need. People use coping strategies to make it through a food insecure time. For example, people may use food-based coping strategies to stretch or ration foods to make it by. These behaviors can exacerbate negative health consequences caused by food insecurity by diminishing the quantity or quality of their diets. The effect on dietary quality is more immediate and severe because people will try to maintain caloric intake, while inadvertently compromising essential micronutrient intake, which has a subtle but negative impact on health. The objective of this study is to explore the relationships between food insecurity, a coping strategy, and dietary quality, using the essential micronutrient folate as an example because of its importance in human health. The data used for this study comes from breastfeeding women in an Ariaal agropastoral community in rural Kenya. Each woman was given a food insecurity score based on interview questions about access to food items. A coping strategy was identified by examining 24-hour dietary recall data. This coping strategy is a way of stretching food by eating the same meal for lunch and dinner. Results show that food insecurity has a negative impact on dietary quality by affecting the intake of folate. We conclude that food-based coping strategies used to deal with the situation can aggravate this effect of food insecurity, which can have detrimental consequences for health.

CLASSIFICATION OF INTERNATIONAL MIGRATIONS
Alexa Williams, Clayton Dewitt, Jake Huneau, Clairesse White
Category: Social Science: General, Section 5
Poster: 432
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Cristian Dona Reveco (Sociology)

Two hundred and fourteen million people are international migrants, or migrants who have relocated to a country other than the country that they were born in. While many people move independently of others, the majority of migrants are part of a

larger migration movement. The classification of these different migration movements is instrumental in understanding driving forces behind migration as well as understanding the effects that migration has on both origin countries and receiving countries. Our research project focuses on classifying and coding research papers on international migrations that have been published in the past fourteen years. We are going to meta-analyze published articles from the journal International in order to classify migration research into different theories as described by Douglas S. Massey in Theories of International Migration: A Review and Appraisal. There are many theories on migration, many of which coexist. While some theories are complimentary of each other, other theories differ drastically. The similarities and differences between these theories, whether small and seemingly inconsequential or large and seemingly influential, are key in pinpointing the specific factors that push both individuals and groups to migrate as well as the specific factors that draw migrants to countries worldwide. Determining these factors aids in identifying both the micro effect on the macro, or the individual effect on the group, and the macro effect on the micro, or the group effect on the individual.

THE INFLUENCE OF LEADERSHIP STYLES
Kayla Cascarilla
Category: Social Science: General, Section 5
Poster: 433
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Michelle Kaminski (Human Resources and Labor Relations)

I will be exploring the similarities and differences in leadership styles between Cesar Chavez and Dolores Huerta, both key leaders of the United Farm Workers union. First, my research will examine their respective biographies. Next, I will apply various theories of leadership power to assess how well these theories describe their experiences. In this section, I will also look the specific influence tactics they used. Finally, I will compare the two leaders to identify the similarities and differences in their approaches.

A COMPARISON OF OPINIONS TOWARDS HISTORIC PRESERVATION BETWEEN RESIDENTS OF HAVANA AND DETROIT
Mark VanPoppelen
Category: Social Science: General, Section 5
Poster: 434
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Egan Brian (Political Science)

This research was conducted in order to make a comparison between the opinions of a Havana resident towards historic preservation versus that of a Detroit resident. The opinion of an individual was assessed through a multiple choice survey that asked whether or not they supported historic preservation, how historic preservation affected them, and their opinion of the amount of historic preservation that is occurring in their city. The participants in the survey consisted of residents of Havana and Detroit, without explicit factors such as age or gender being a factor in their selection. For the residents of Havana, it was consistently found that they felt historic preservation is important and that it affects them in a beneficial way. However, they were equally split on the amount of historic preservation occurring with half saying that more should occur and the other half saying the current amount occurring in Havana is adequate. In comparison, residents in Detroit were split in their answers in the survey, but most had a positive opinion of historic preservation. The conclusion made was that residents of Havana in general have a more positive opinion of historically and would be more likely to support more historic preservation. This research would allow one to see an aspect of comparison between the resident of Havana, Cuba and Detroit, Michigan.

FREQUENCY AND TYPE OF FAMILY COMMUNICATION EFFECTS THE MENTAL HEALTH OUTCOMES OF NATIONAL GUARD SERVICE MEMBERS
Kaitlin Justice, Kali Pierce
Category: Social Science: General, Section 5
Poster: 435
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Adrian Blow (Human Development and Family Studies)

National Guard service members are frequently returning home from deployment with mental health issues, including alcohol abuse, depression, and post traumatic stress syndrome (PTSD). Unlike other branches of the military, the part-time National Guard members are dispersed throughout the country without access to a variety of support services. Without these support services, family communication has provided support and positive effects on alcohol use, depression, and PTSD that service members might encounter. Questionnaires prior to deployment and post deployment were used to gather information surrounding a soldier's life; including family relationships, alcohol use, depression and PTSD. A total of 268 soldiers were followed from pre to post deployment. The pre deployment surveys showed that service members that had less frequent communication with their family members, specifically their mothers, tended to have higher alcohol use. We will study how this trend continues after deployment, and how different types of communication, the frequency of communication, and with whom, affect the soldier's mental health. The barriers to communication with these family members, particularly parents of

service members, will also be assessed along with proximity to parents to better understand how these factors play a role in mental health.

ELECTRONICALLY DUMPED: ILLEGAL ELECTRONIC WASTE DISPOSAL
Austin Flowers
Category: Social Science: General, Section 5
Poster: 436
Location: Ballroom, 1:30 PM-3:30 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 different countries since the beginning of the 21st Century. The project focuses on finding the "e-waste" legislation of countries in the Organisation of Economic Co-operation and Development, European Union (and those waiting for admittance), along with Brazil, Russia, India and China. The legislation is then compared through cited cases of punishment by country, which are found in the different newspapers published around the globe. This allows the understanding of how each country currently deals with the issue. In the presentation, each country's legislation and comparison of the case studies will be presented to show how illegal activity is handled worldwide. It will examine the hypothetical punishment, in terms of legislation, and the real world cases, or actual recorded punishments. Overall, it will display how different countries try to dissuade the rising issue of illegally imported, exported, and dumped e-waste and how the legal systems try to address a new issue upcoming in the international system.

MAPPING RECIDIVISM FOR WOMEN OFFENDERS FROM DIFFERING NEIGHBORHOODS THROUGHOUT WAYNE COUNTY, MICHIGAN
Malyssa Suarez
Category: Social Science: General, Section 5
Poster: 437
Location: Ballroom, 1:30 PM-3:30 PM
Mentor(s): Merry Morash (Criminal Justice)

In conjunction with prior research that identifies certain neighborhood conditions that correlate with high crime rates for a given census tract, this research examined the relationship between these conditions and recidivism among women offenders. One hundred and eighty convicted women offenders from Wayne County who were on probation or parole for at least two months were interviewed at three different times: a primary interview and two others at three-month intervals. Criminal history data for a twelve-month period following the woman's initial interview, which included both arrest and conviction data, were obtained from the Michigan State Police. Spatial analyses performed in a geographic information system were used to produce a map of the census tracts in Wayne County that exhibited all of the conditions correlated with high crime rates. A map of the cross streets of each woman's neighborhood was overlaid on top of the census tract map. The hypothesis of this study was that women who reside in neighborhoods exhibiting all or most of the known census tract conditions correlated with high crime rates were more likely to recidivate than women who were from better neighborhoods. Analyses examined whether women who recidivated in the twelve-month period following their initial interview differed in the conditions of their neighborhoods as compared to women who did not recidivate in the twelve-month period following their initial interview. The results of this study add to previous research on neighborhood conditions and their correlation to recidivism and high crime rates.

SOCIAL WORK

POSTER PRESENTATIONS, SECTION 1

LENDING A HAND AND EMPOWERING PEOPLE
Christina Johnson
Category: Social Work, Section 1
Poster: 440
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Joseph Kozakiewicz (Social Work)

The Chance at Childhood Legal Self Help Center (LSHC) assists patrons in understanding and filling out paperwork they need in order to file a motion successfully with the Ingham County Friend of the Court. The LSHC attempts to empower the patron by allowing them to fully understand the process of court documents, steps needed in order to file effectively, and the confidence to enter in a motion with the court. Each patron is asked to fill out a survey at the time of service which allows the researcher to understand demographics of the population it is serving as well as information on how the patron views the LSHC itself. Three months after the visit, the researcher contacts each patron who has agreed to participate in a post-survey

to gain insight into the attitude of the patron before, during, and after the visit to the LSHC. The research compiled shows that the LSHC is highly effective in helping patrons through the court filing process and that while more research is needed, the continuity of the LSHC is vital for many persons filing paperwork with the court.

THE ROLE OF CHILDHOOD ADVERSE EVENTS WITH SUICIDE ATTEMPTS: AN EXAMINATION OF INCARCERATED WOMEN
Carmen Hillier
Category: Social Work, Section 1
Poster: 441
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Gina Fedock (Social Work), Sheryl Kubiak (Social Work)

Suicide is the second leading cause of death in state prisons, only following illness, and accounts for approximately 7% of state prisoner deaths (U.S. Department of Justice, 2012). Suicide rates for women in prison are nearly as high as male inmate rates and are double the rate of the female non-incarcerated population (Dye, 2011). Studies have found that incarcerated women present with elevated numbers of childhood adverse events than women in the community and these histories are linked with a higher risk of suicide attempts (Friestad, Ase-Bente, & Kjelsberg, 2012; Clements-Noelle, Wolden, & Bargmann-Losche, 2009; Messina & Grella, 2006). However, it is less known exactly which type(s) of childhood adverse events are significantly associated with suicide attempts for incarcerated women. To address this issue, a clinical intake interview was reviewed for a sample of 38 incarcerated women convicted of violent offenses. Questions included in the interview covered childhood emotional abuse, physical abuse, sexual abuse, parental substance abuse and/or mental illness, family dynamics, and witnessing family violence. Participants' responses were coded as "yes" or "no", and Chi-Square tests were performed to explore the relationship between each type of childhood adverse event and suicide attempts throughout the lifetime. Childhood physical abuse, emotional abuse, and sexual abuse were found to be significantly associated with suicide attempts. Emotional abuse showed the greatest level of significance with suicide attempts. These findings spotlight the need for suicide prevention interventions for incarcerated women to address the role of these types of childhood adverse events.

UNEQUAL ACCESS: MAPPING RACIAL/ETHNIC DISPARITIES IN GEOGRAPHIC ACCESS TO COMMUNITY MENTAL HEALTH SERVICES
Samantha Linck
Category: Social Work, Section 1
Poster: 442
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Sacha Klein (Social Work)

Research demonstrates that Latinos have high rates of mental health needs (Alegria et al., 2007; Martinez Pincay & Guarnaccia, 2007), but low rates of mental health treatment service utilization (Alegría et al., 2007; Barreto & Segal, 2005). This phenomenon is often ascribed to cultural and language barriers to accessing services. Our study considers an unexplored factor that could contribute to disparities in access and utilization of mental health services by Latinos: the geography of where Latinos live in relationship to mental health treatment service locations. Specifically, we explore whether there are racial/ethnic disparities in the geographic accessibility of Community-based Mental Health (CMH) treatment services for Michigan residents and what explains these disparities. To answer these questions, we used ArcGIS 10.0 software to geocode and map the addresses of CMH service locations in Michigan, identified the geographic center (centroid) of all 2010 Michigan Census tracts (N=2,769), and then calculated the distance from each of these centroids to the nearest CMH service location. We developed maps that show Latino/Hispanic, non-Hispanic White, and non-Hispanic Black neighborhoods in relation to CMH service locations. Our results should indicate whether Latino/Hispanics would have to travel farther than non-Hispanic Whites and non-Hispanic Blacks to reach CMH agencies. These findings add a spatial dimension to the study of mental health service disparities in the Latino population. Further, this study will inform community mental health systems in developing strategies to improve outreach and equitable access for this underserved population.

DEMOGRAPHIC RISK FACTORS FOR TEEN COURT OFFENDERS
Taylor Birman
Category: Social Work, Section 1
Poster: 443
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Gretchen Archer (Social Work)

The Lansing Teen Court program is a juvenile diversion program that offers an alternative judicial system for youths between the ages of 11 and 17 who have committed minor legal offenses. The youths stand before a peer jury, must admit their guilt, and then receive sentences that include community service, letters of apology, restitution, and counseling. Child and Family Charities' Teen Court Collaborative (TCC) program works with the Lansing Teen Court to provide counseling to Teen Court offenders, and data was collected from 28 of Child and Family adolescent participants between 2012 and 2013. This study discusses correlations found between demographic characteristics and the mental and emotional health diagnoses made for

Teen Court participants. Further research is necessary to determine the effects of Child and Family's Teen Court Collaborative program on the outcomes of clients with different demographic characteristics.

DETROIT NEIGHBORHOODS: A COMPARATIVE STUDY
Samantha Morgan
Category: Social Work, Section 1
Poster: 444
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Marya Sosulski (Social Work)

What makes a community? Are there certain characteristics of a neighborhood that causes it to maintain its members? Over the decades, Detroit, Michigan has changed drastically. Some may argue for the worst, some for the best. Currently, there are many university and local foundations that have spent their time in Detroit to address their concerns. They have administered surveys, focus groups, and interviews to examine individual and community responses to services and assets, or a lack thereof, and the impact changes in the city's support for neighborhoods (i.e., providing or withdrawing resources) has had on community members. Research has shown that personal experiences, neighborhood support, safe space, and trust are key factors to maintain an overall sense of community and neighborhood preservation. To examine these trends in the context of communities in the process of change, this study used data from the Census Bureau's American Community Survey to compare the characteristics of the following Detroit neighborhoods: Brightmoor, Southwest Detroit, Midtown, and Cody Rouge in order to determine which factors enable residents to remain in their homes rather than having to relocate because of decline, as well as those that foster neighborhood growth and development. Descriptive statistics and regression analysis included demographic factors and variables relating to housing, economic development, and social networks. The outcomes of the study will contribute to an expansion of the research with qualitative components, as well as plans to create a university-neighborhood partner initiative in Detroit.

AN OBSTACLE TO OPPORTUNITY: THE IMPACT AND IMPLICATIONS OF STIGMA ON MENTAL HEALTH CONSUMERS
Kathryn Coleman
Category: Social Work, Section 1
Poster: 445
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Marya Sosulski (Social Work)

This research addresses the problem of stigma, and the effects it has on the lives of mental health consumers. In order to deconstruct the problem of stigma, it is important to understand the main sources of stigma regarding mental illness and ways in which stigma can be reduced. Depending on the individual's experience, stigma is defined differently. Research was conducted on data from a re-implementation of the Recovery Enhancing Environment (REE) survey, a statewide survey first conducted in Michigan in 2010. Additionally, focus groups identified how consumers responded to recovery-oriented treatment and services within the Community Mental Health Authority in Clinton, Eaton, and Ingham counties (CMHA-CEI). A second question involved the role of structural and institutional factors in improving recovery. Questions on the survey focus on topics such as, stigma, recovery, peer support, community integration, and personal experience in order to determine which treatment and services are essential to the recovery process. Throughout this research there was an emphasis on stigma, the different ways in which consumers perceive stigma, and how stigma affects consumers who utilize mental health services. The results show that consumers of mental health services disproportionately view stigma in a negative way, as opposed to a motivating factor in pursuing recovery. According to the participants, stigma hinders recovery, especially in the realms of employment, law enforcement, mental health facilities (providers), self-perception, family, and friends (social networks). This research strives to create awareness within mental health agencies about stigma and the impact it has on their consumers.

USING GEOGRAPHIC INFORMATION SYSTEMS (GIS) TO IMPROVE SOCIAL WORK STUDENTS' PRACTICE
Kaitlyn Kapnick
Category: Social Work, Section 1
Poster: 446
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Gina Fedock (Social Work), Sacha Klein (Social Work)

Geographic Information Services (GIS) is historically prominent in social work, and remains relevant for social work practice (Hillier, 2007). GIS has multiple purposes, including planning service provision (Wolk-Branigin et al, 2009), assessing service accessibility (Rine et al, 2012), and adjusting services (Kim et al, 2012). As part of the evidence-based practice model (Felke, 2006), there is an emphasis on introducing MSW students to GIS in their field practicums (Wakins, 2001) and classrooms (Wier & Robertson, 1998). However, GIS is highly under-utilized within social work education. The purpose of this project is to examine the experiences of faculty utilizing GIS within their social work classrooms to explore the expected outcomes students may gain. Semi-structured interviews were conducted with 11 social work faculty in the United States and transcribed verbatim for analysis. A thematic analysis was conducted manually to identify emerging themes related to social

work instructors' expectations of student outcomes. Preliminary results indicate that instructors have two main goals for MSW students' GIS-related learning: (1) for students to gain an understanding of the role of community, environment, and context on social problems; and (2) for students to apply GIS skills immediately in their field placements and in future job positions. Instructors reported having to take into account and work with students' predominantly clinical perspectives and adjust their lesson planning based on students' current technological skill level. Insight from these interviews can assist social work instructors in incorporating GIS into their classrooms and better preparing students for social work practice.

"WE'RE FLOWERS, BUT WE'RE JUST WEEDS": EXAMINING SOCIAL INTERACTIONS OF OLDER ADULTS WITH MENTAL ILLNESS
Elizabeth Bonham
Category: Social Work, Section 1
Poster: 447
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Amanda Toler Woodward (Social Work)

In 2008, 1 million older adults were suffering from mental illness, with that number expected to double by 2030 (Cummings and McClure Cassie, 2008). While general information has been gathered regarding mental illness in the aging population, this study specifically considers ways in which mental illness has affected older adults in their ability to maintain and foster social relationships throughout the life course. This project utilizes one on one interviews with a modified life history calendar (LHC) to better understand mental illness and social support within the aging population, including social interactions with family, friends, or those created within helping services. The LHC serves as a visual timeline of interviewees' experiences including areas such as work history, support systems of friends and family, education, social services or treatment sought out, and resources including economic assistance, and so on. The project uses semi-structured interviews with broad and open-ended questions, allowing for a retrieval of very individual and unique qualitative data with room for personal anecdotal experience. Approximately ten participants were recruited from Community Mental Health and other social service agencies in the East Lansing area. This poster will present interviewees' experiences with social interactions. It is expected that the study will help answer questions of both positive and negative social interactions among older adults with mental illness.

A MEANINGFUL LIFE: THE IMPORTANCE OF PSYCHOLOGICAL COMMUNITY INTEGRATION IN MENTAL HEALTH RECOVERY
Jennifer Campbell
Category: Social Work, Section 1
Poster: 448
Location: Mosaic Multipurpose Room, 9:30 AM-11:30 AM
Mentor(s): Marya Sosulski (Social Work)

Community integration has been shown in literature to be a paramount aspect of recovery from mental illness. There are three types of community integration, including physical, social, and psychological. The least studied aspect is psychological community integration, such as sense of community. This research study examines how participants define psychological community integration, how strongly a sense of community is felt among participants, and the variation in participant preferences for psychological community integration. This study used data analyzed from the Recovery Enhancing Environment survey re-implemented in 2012-2013 to consumers in Community Mental Health Authority agencies of Clinton, Eaton, and Ingham counties (CMHA-CEI) to see how important positive relationships were and how involved consumers were in activities that were meaningful to them. Five focus groups with 44 participants provided case studies about individual preferences for psychological community integration. Results found that some consumers preferred frequent interaction with community members outside of mental health agencies. Agencies may be viewed by consumers as "stepping stones" of integrating into the community. Other consumers preferred to not go into the community and instead find their support from CMH agencies. Ten consumers talked about changing their past habits and patterns of psychological community integration along the recovery process. Preferences about psychological community integration may change for individuals at different parts of their recovery journey. This research indicates that participants in CMHA-CEI have different views about the importance and meaning of psychological community integration in recovery.

POSTER PRESENTATIONS, SECTION 2

HEALTH INFORMATION AND THE GERIATRIC POPULATION
Hadley Brandenburg, Lisa Swinter
Category: Social Work, Section 2
Poster: 449
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Paul Freddolino (Social Work), Amanda Woodward (Social Work)

Our research focuses on older adults and their sources of health information and their confidence with using technology. Our focus is the sources of health information in a sample of adults who are using a telehealth system as home health care.

Existing research has shown with proper support older adults can use online resources to begin to take control of their health care. Better access to health care information can reduce readmission rates as well as relieve caregiver burdens. It's important to know what older adults need in order to feel comfortable using technology so they can take full advantage of technology based health resources. The data comes from a project examining patient experiences with telehealth in home health care. We will be interviewing patients in their home using a semi-structured interview protocol on their experience with the use of their telehealth system, and online health information. The main purpose of the interviews is to determine what factors influence the acceptability, use, and effectiveness of technology available for improving home health care. The overall goal is to determine what training and support programs are needed when it comes to improving the patient outcomes and reducing medical costs. We will present on our results from patient interviews around themes of ease of technology use and their health information sources.

IMPLICATIONS OF CIVIC ENGAGEMENT WITHIN COMMUNITY SYSTEMS
Marie Rose
Category: Social Work, Section 2
Poster: 450
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Marya Sosulski (Social Work)

The purpose of this research is to investigate the factors that contribute to varying levels of civic engagement. Civic engagement is the act of individual and collective participation in addressing issues of public concern, which is impacted by many aspects present within the environments individuals inhabit. This study assessed the types of factors that contribute to civic engagement within selected urban community systems, including political engagement, participation in community organizations (e.g., religious institutions and school associations), levels of trust in neighborhoods, and levels of confidence in national and local institutions. Data from the Census Bureau's Current Population Survey (March Supplement 2011) were analyzed to determine which individual and neighborhood characteristics contributed to different kinds of engagement. Descriptive statistics and regression analysis included demographic factors and variables relating to housing, economic development, and social networks. Levels of civic engagement vary among households and neighborhoods but it is vital to improving the well-being of individuals and the general public, and therefore should be studied as a primary strategy to building and strengthening communities. The results point to significant implications for practice and policy including the promotion of interventions at all levels.

CAREGIVER ROLE AND PATIENT USE OF TELEHEALTH RESOURCES
Marianne Caddy
Category: Social Work, Section 2
Poster: 451
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Paul Freddolino (Social Work), Amanda Woodward (Social Work)

The focus of this research project is the caregiver role in patient use of telehealth services. Telehealth is defined as the delivery of health-related services and information via a range of technologies including email, the Internet, and patient symptom monitoring devices. The caregiver role in relation to patient telehealth use is vital. These interactions can range from using a phone call to schedule a doctor's appointment, helping a senior navigate the Internet, or aiding a patient in using an in-home telehealth device that monitors vital signs (e.g.,blood pressure) daily. Data for this project are from a pilot study; Identifying Patient Training and Support Needs to Maximize Telehealth Outcomes. Senior telehealth users were contacted via recommendations through a home health care agency , and then interviewed about their experiences with in-home telehealth technology. The data and semi-structured interview questions in specific focus for this project relate to caregivers, stress, and patient use of telehealth resources. Based on a previously conducted literature review, it is expected to see themes of caregivers aiding in the telehealth process, and telehealth lessening caregiver stress and burden. Comments about telehealth challenges faced by caregivers and patients are also likely. The presentation shall be focused on how the research project findings define the relationship between caregivers and patient use of telehealth resources.

HEAD START IMPACT ON FOSTER CARE PARENTS AND CHILDREN
Kayleigh Wang
Category: Social Work, Section 2
Poster: 452
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Kyunghee Lee (Social Work)

Using the Head Start Impact Study Data, this secondary data analysis examines Head Start's impacts on foster care parental behaviors and children's cognitive and socio-emotional outcomes. Out of 4442 children, 207 children (Head Start = 127, Control = 81) who lived with adoptive mother/father, foster parents grandmother/grandfather, great grandmother, or other relatives were selected. When children were 5-6 years old, parental child-rearing behaviors and children's outcomes were measured. Parents' child-rearing behavior was measured by the frequencies of book-reading. Children's cognitive outcomes

were measured by the Woodcock Johnson III test (language, literacy and math), and their socio-emotional outcomes were measured by Adjustment Scales for Preschool Intervention (aggressive, withdrawn/low energy, socially reticent, oppositional, and inattentive/hyperactive). Specific questions addressed are: (1) Do parental child-rearing behaviors differ between foster care parents who participated in Head Start and those who did not participate? (2) Do children's cognitive and socio-emotional scores differ between children who participated in Head Start and those who did not? (3) Do parents' child-rearing behaviors affect children's cognitive and socio-emotional scores? Although there was no main effect of Head Start on parental book reading, sub-group Head Start effects were found for black foster parents and foster parents of children whose pre-academic skills were lower prior to Head Start enrollment. Parental book reading affected positively on children's cognitive outcomes and socio-emotional outcomes. Baseline characteristics (ethnicity, maternal education, family income, child gender) were significantly associated with Head Start impacts on both parents and children.

BEHAVIORAL AND CULTURAL DIFFERENCES OF THE AMERICAN INDIAN POPULATION IN THE EXPERIENCE OF PHYSICAL PAIN
Jessie Lucero
Category: Social Work, Section 2
Poster: 453
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Suzanne Cross (Social Work)

This qualitative and quantitative research study was conducted to understand the biological and/or physiological differences of pain tolerance in the American Indian population (Gorospe 2006; Warne 2008). The study was approved by the MSU Human Subjects IRB and the Tribal Manager at Grand Traverse Band of Ottawa and Chippewa Indians. Seventy-five subjects in the age range of 18-99, from 14 tribal nations participated in 30-60 minute, individual face-to-face or telephone interviews. The questionnaire was implemented to query causes of pain, pain levels, treatment, and help-seeking behaviors (Haozous & Knobf (2010). The findings revealed American Indians who are in physical pain seek ways to heal either through Westernized medicine, traditional healing, or both. American Indians feel pain no differently than other populations, but cultural ways and/or historical experiences have an impact on how they express pain (Struthers, Savik, & Hodge (2004). The majority of participants live bi-culturally, while a small number live the traditionally life ways, or chose assimilation into the Western culture. These findings will assist mainstream medical professionals in providing care appropriate for American Indians who are experiencing pain.

HIV/AIDS AND MIGRANT WORKERS
Raul Orduna
Category: Social Work, Section 2
Poster: 454
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Pilar Horner (Social Work)

The research conducted was to gather information from agencies across the state that claimed they provided information to the Latino migrant population in regards to HIV/AIDS treatment and prevention. Learning about information available and the resources that allocated to informing the population is important because of the effects HIV/AIDS has on the population, and the ease with which the STD is transmitted. The research is important for the purpose of knowing that the resources being provided are adequate and that prevention methods are being implemented in informing the migrant population. By conducting the research we are better able to understand the barriers that these agencies are facing and how they can overcome these barriers to effectively deliver treatment and information. The research conducted was by phone interviews with agencies across the state with questions aimed at gauging the effectiveness of the agency and their knowledge about the population. The questions ranged from inquiring about the agency, services provided, how the agency effectively engaged the migrant population, and what the agencies were encountering when they went out to migrant camps. This presentation will be on the findings from the interviews with the agency contact, and what conclusions we are able to draw from the information provided from the agency contact.

THE PARENT-YOUNG CHILD PROGRAM: A RESEARCH EVALUATION
Brittany Massa
Category: Social Work, Section 2
Poster: 455
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Jennifer Farley (Social Work)

The Parent-Young Child Program (PYCP) is a Community Mental Health (CMH) program in Lansing. The PYCP provides intensive mental health services for families with young children ages 3 to 5 that display significant emotional and developmental needs. The program focuses on the child's safety, social, and emotional needs along with parental wellbeing, and the parent-child relationship. A program evaluation is being conducted to explore the treatment process and its relation to treatment outcomes. The evaluation utilizes a variety of measures including clinical staff and parent interviews which will

be the focus of this proposal. A total of twenty-six interviews have been conducted (and are currently being analyzed) with clinical staff and parents. Interviews explored treatment modalities and the process of providing services to children and families with clinical staff, while parental interviews explored their level of involvement within treatment sessions, and program satisfaction. In this presentation, I will discuss the results of these interviews and how they relate both to the process and overall goals of the PYCP.

TEEN COURT
Charletta Hill
Category: Social Work, Section 2
Poster: 456
Location: Mosaic Multipurpose Room, 1:30 PM-3:30 PM
Mentor(s): Gretchen Archer (Social Work)

Teen Court provides juvenile justice diversion services for Ingham County first-time juvenile offenders between the ages of 11-16. When entering the program the teens must take responsibility for their offense and participate in a variety of requirements and services that are designed to help them address risk factors, (such as negative peer pressure, underage drinking or poor school performance), that may have contributed to their poor choice, resulting in a criminal offense. This study examines the experiences of youth who participated in the Teen Court program as program participants or peer jurors. Teen Court offenders were asked to reflect on whether the program had any impact on their attitude, knowledge of the law, grades, communication skills and behaviors with regard to peer pressure. Teen Court jurors were asked to reflect on the challenges teens face and whether they would volunteer for the experience as a peer juror in the future. Self-report questionnaires were used to collect evaluation data from both youth offenders and volunteer peer jurors.

TOXICOLOGY

POSTER PRESENTATIONS, SECTION 1

GAINING INSIGHT INTO MECHANISMS OF NSAID-INDUCED LIVER INJURY WITH AN IN VITRO SYSTEM: ROLE OF INFLAMMATORY CYTOKINES
Lukas Gora
Category: Toxicology, Section 1
Poster: 460
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Robert Roth (Pharmacology and Toxicology)

Idiosyncratic, drug-induced liver injury (IDILI) is a typically rare reaction that can result in severe liver injury or death. The mechanisms of IDILI are unknown. However, animal models suggest that immune mediators are important in the pathogenesis. Tumor necrosis factor-alpha (TNF) and interferon-gamma (IFNg) are two mediators that are required for liver injury that occurs in animal models of IDILI. We tested the hypothesis that nonsteroidal anti-inflammatory drugs (NSAIDs) associated with IDILI in humans synergize with TNF and/or IFNg to cause death of hepatocytes in vitro. HepG2 cells were treated with diclofenac (DCLF), sulindac (SLD) sulfide (active metabolite of SLD), or bromfenac (BRO) alone and in combination with TNF and/or IFNg. Cytotoxicity occurred when cells were treated with drug+TNF but not with either agent alone. IFNg potentiated the cytotoxic interaction mediated by drug+TNF. To explore mechanisms by which these drugs synergize with TNF and IFNg to cause cytotoxicity, involvement of caspases and mitogen-activated protein kinases (MAPKs) was investigated. An inhibitor of caspases protected cells from the cytotoxic interaction induced by drug+TNF/IFNg. Inhibitors of either c-Jun N-terminal kinase (JNK) or extracellular signal-regulated kinase (ERK) reduced cytotoxicity mediated by drug+TNF/IFNg, whereas inhibition of p38 potentiated the cytotoxicity. These findings indicate that NSAIDs can interact with cytokines to cause cytotoxicity and raise the possibility that some IDILI reactions result from drug-cytokine synergy involving activation of caspases and MAPK pathways.

DEVELOPMENT OF THE PLAQUE-FORMING ASSAY AND IGM/IGG ELISA TO ASSESS ANTIBODY RESPONSE TO SHEEP RED BLOOD CELLS IN MICE
Jenna Bursley
Category: Toxicology, Section 1
Poster: 461
Location: Lake Huron Room, 1:30 PM-3:30 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. But, the role of Nrf2 in regulating B cells activated with other stimuli or under in vivo conditions has not been characterized. The purpose of the present studies was to compare the induction of antibody-producing B cells

in response to sheep red blood cells (sRBC) in wild-type and Nrf2-null mice. In contrast to LPS, B cell response to sRBC requires the participation of other cell types, including dendritic cells/macrophages and T cells. In order to assess response to sRBC, we first had to develop the methodology to detect antibody-producing B cells. We used multiple approaches, including IgM and IgG enzyme-linked immunosorbant assays (ELISA) and plaque-forming cell assay. We were able to successfully detect antibody production using all three approaches in wild-type C57Bl/6 mice. Although we have initiated studies to compare antibody production in response to sRBC in wild-type and Nrf2-null mice, we have only been able to implement two studies and results are inconclusive thus far in part due to high variability. Thus, more studies will be needed to determine the role of Nrf2 in antibody production in response to sRBC in mice. (This work is supported by NIH grant: ES018885.)

DOES AGING AFFECT K+-INDUCED DILATION OF RESISTANCE ARTERIES FROM C57BL-6 MICE?
Jessica Pettis
Category: Toxicology, Section 1
Poster: 462
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): William Jackson (Pharmacology and Toxicology)

Myogenic tone of smooth muscle cells in small arteries regulates tissue blood flow and contributes to the regulation of blood pressure. Skeletal muscle blood flow regulation is impaired with aging. Elevated extracellular K+ has been proposed to mediate vasodilation during exercise. We hypothesized that aging would reduce resistance artery dilation to elevated extracellular K+. We dissected arteries from abdominal muscles from young (3 months) or aged (24 months) mice, and transferred them to a cannulation chamber. The arteries were cannulated with micropipettes and tied with nylon monofilament sutures. Vessels were imaged using an inverted microscope coupled to a video camera. Vessels were pressurized to 80 cm H2O and the internal diameters were measured before and during exposure to 15 mM K+ solutions. Maximal diameters were assessed by exposing the arteries to solutions containing 0 mM Ca2+. We found that the maximum diameters of the arteries in the young (178±3μm, N=11) were larger than in the aged (165±4μm, N=12) mice. However, myogenic tone (young = 12±2% vs. aged = 12±3%) and dilation in response to K+ (young = 59±7% vs. aged = 61±8%) were similar between vessels from young and aged mice. Our data contradict our initial hypothesis that K+-induced dilation is impaired in aged mice. The impairment of the regulation of blood flow that occurs in aging may not be due to altered K+ - induced dilation, but may be limited by a reduced maximum diameter observed in arteries of the aged.

THE EFFECTS OF INSECTICIDE SPINETORAM ON GAP-JUNCTION INTERCELLULAR COMMUNICATION IN WB-144 RAT LIVER CELLS
Kim Vi
Category: Toxicology, Section 1
Poster: 463
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Brad Upham (Pediatrics and Human Development)

The inhibition of gap-junction intercellular communication is a known mechanism of carcinogenicity in polycyclic aromatic hydrocarbons (PAHs). Of specific interest are compounds that pose a “bay region,” a structural property of the molecule that includes an incomplete ring formed by the junction of multiple aromatic rings (Weis et al 1998). The commercially-used pesticide spinetoram is a spinosad insectide, which targets acetylcholine receptors in an insect and kills it via hyperexcitation of the nervous system (Qiao et al 2007). Based on the bay-like molecular structure observed in spinetoram, the compound was tested for inhibition of gap-junction intercellular communication in WB-144 rat liver cell cultures. This effect is observed by measuring the distance traveled by fluorescent dye administered via scrape-load procedure. Preliminary data support the hypothesis that gap-junction intercellular communication inhibition will follow a dose-dependent response curve following incubation with spinetoram.

NARROWING THE LOCATION OF A 129 SV ALLELE ON THE GENOME OF BLACK C57B6 MICE
Phil Olson
Category: Toxicology, Section 1
Poster: 464
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Jeff Leipprandt (Pharmacology and Toxicology)

Heterotrimeric G-proteins’ function is to transmit signals into a cell. A mutation, G184S, found on the α-subunit of the Go-protein, was cloned into 129 SV mice. After backcrossing this mutation into C57B6 mice, it was discovered that it triggered decreased viability due to frequent seizure activity. However, some of the mutation-carrying B6 mice weren’t exhibiting the same seizure rate. It is hypothesized, that these B6 mice contain a residual 129 SV allele somewhere on their genome, which is inhibiting the fatal affect of the mutation. I hypothesized that this allele lies somewhere on Mb 47 of chromosome 17. To test this, 8 mice where introduced into a kindling experiment. They were injected with non-lethal amounts of Pentylenetetrazole (PTZ), a seizure-inducing drug, and were observed for 30 minutes for any signs of sensitization. Out of

the 8 mice tested, 3 contained the 129 allele at Mb 47. Two of the three mice containing the 129 allele have been sensitized to PZT, with one mouse still receiving injections. However, the amount of injections didn't surpass that of the injections needed to sensitize the pure B6 mice. Therefore, the allele is either not present at Mb 47, or the 129 allele isn't effectively inhibiting the affect of the mutation. These results are limited due to the small sample size tested, so, potentially, with more mice, the predicted results will be achieved. This experiment will continue until a sufficient number of mice have been tested, and a statistically significant result has been attained.

THE EFFECT OF ETHINYL- ESTRADIOL SULFATE ON THE ENDOCRINE SYSTEM OF MALE FATHEAD MINNOW
Brian Batayeh
Category: Toxicology, Section 1
Poster: 465
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Cheryl Murphy (Fisheries and Wildlife)

This study was conducted to examine the endocrinological impacts of Ethinyl-Estradiol sulfate (EE2S), a conjugate of the known endocrine disrupter Ethinyl Estradiol (EE2), on male fathead minnow. EE2 has been known to induce vitellogenin production and increase liver size in male fathead minnow by binding to estrogen receptors. This liver enlargement may be due to inflammatory processes that result from the interaction of drugs with hepatocytes, and may be indicative of a drug induced liver injury and/or vitellogenin production. In previous studies on drug overdose, the Cytochrome P450 pathway predominates and leads to hepatocytes with increased oxidative stress, a depletion of ATP, DNA damage, amongst other dysfunctional impacts within the cells (Ganey, and Roth 157-173). This study was executed by exposing the male fathead minnow to increasing concentrations of EE2 and EE2S in their water supply for 96 hours and then performing a necropsy in order to collect the gonads, the liver, and a blood sample for vitellogenin testing. The results suggest a positive correlation between drug concentration and liver size in both the EE2 and EE2S. The average liver mass 0.68g±0.28g, 1.56g±0.57g and 1.34g±0.52g for the control fish, 100ng/L EE2 and 100 ng/L EE2S respectively. The EE2S had however, enlarged livers in comparison to the samples collected from the control group, but not as large as the EE2 group. This study suggests that EE2S may have some toxic effects because of the enlarged liver.

THE ROLE OF PARKIN IN NEUROTOXICANT-MEDIATED MICROTUBULE DESTABILIZATION IN A NEURONAL CELL LINE AND MOUSE BRAIN
Zachary DeRade
Category: Toxicology, Section 1
Poster: 466
Location: Lake Huron Room, 1:30 PM-3:30 PM
Mentor(s): Keith Lookingland (Pharmacology and Toxicology)

The role of parkin, a purported E3 ligase which tags defective proteins to be degraded in the ubiquitin proteasome pathway (UPP), is not yet fully understood in the context of Parkinson's Disease (PD). This PD-related protein has also been attributed to having a role in the stability and degradation of microtubules. Microtubule destruction has been implicated in the neurodegeneration of nigrostriatal dopamine (NSDA) and has been compared to other DA neurons such as tuberoinfundibular dopamine (TIDA) neurons in terms of differences in axon length. NSDA neurons project a relatively long distance compared to the short axons of TIDA neurons. The length of the axonal projections could be a risk factor for the magnitude of cytoskeletal defects by factors implied in PD such as neurotoxicant or pesticide exposure. In previous studies, parkin was found to co-localize along microtubules when viewed through confocal microscopy. This study seeks to examine the effects of MPP+ and Colchicine on the appearance of parkin staining in MN9D cells and mouse brain tissue. In addition, it will look at comparisons between TIDA and NSDA neurons and the appearance of parkin and microtubule staining after exposure to MPP+ and colchicne.

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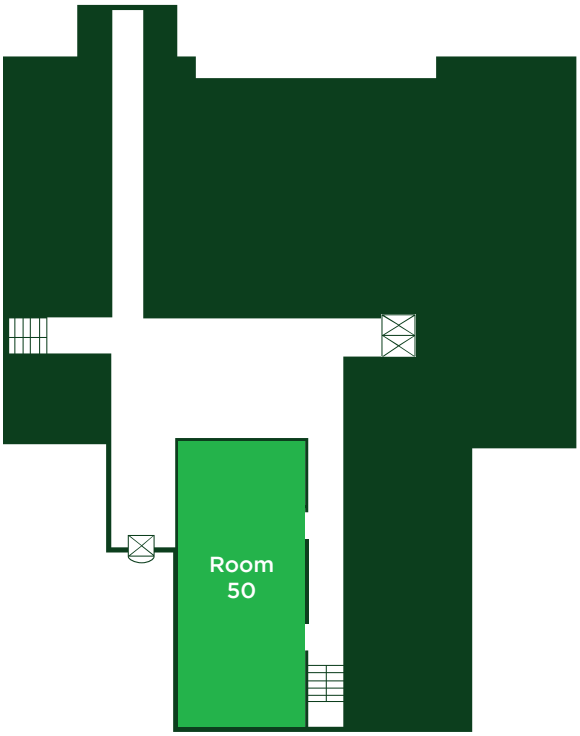

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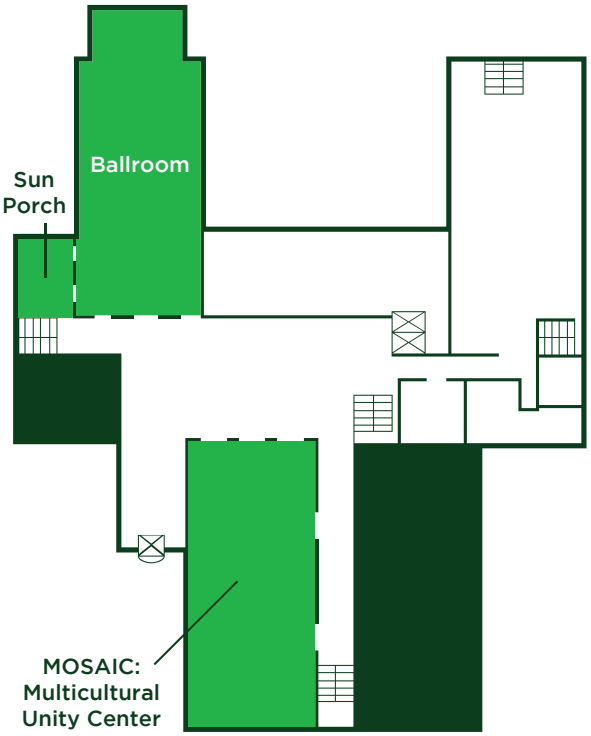
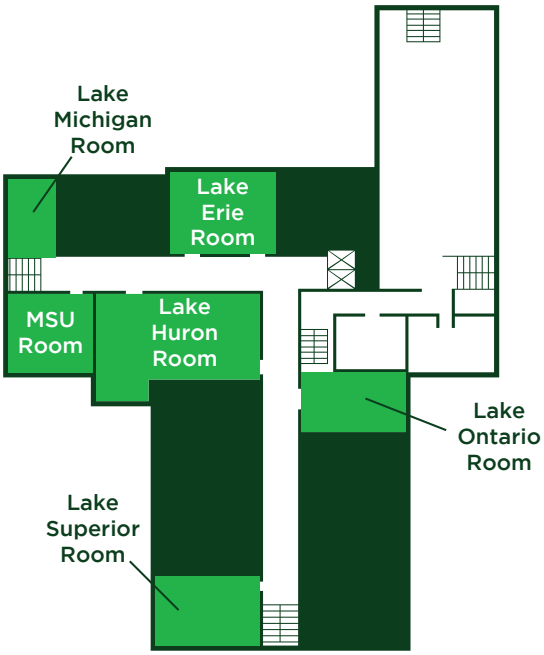
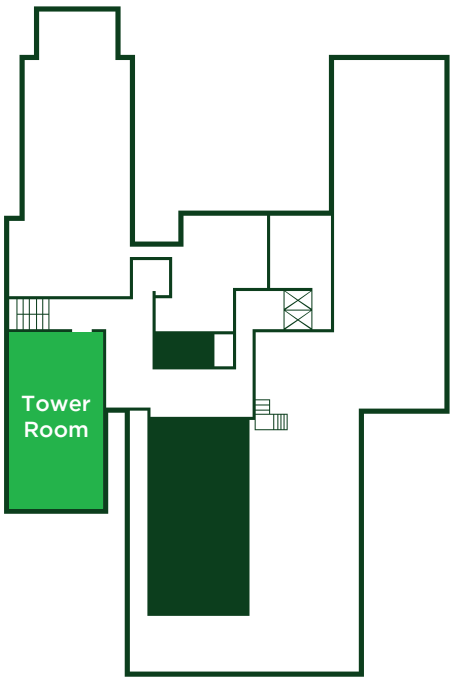


Third Floor



Fourth Floor



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